

# **NEW HAMPSHIRE FOREST MARKET REPORT**

## **1984**



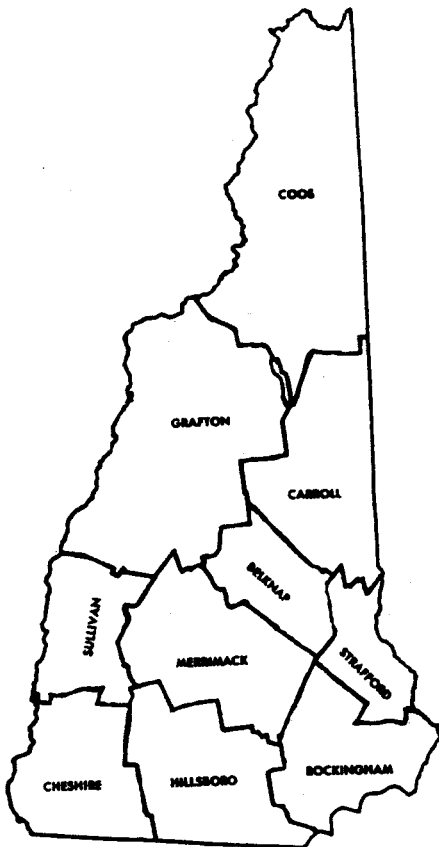
**COOPERATIVE EXTENSION SERVICE  
UNIVERSITY OF NEW HAMPSHIRE**

with the

**NEW HAMPSHIRE DEPARTMENT OF RESOURCES  
AND ECONOMIC DEVELOPMENT COOPERATING**

MAP OF NEW HAMPSHIRE

(Showing Counties)



By

Nicolas Engalichev, *Extension Specialist*  
*Forest Products Marketing and Utilization*

and

David L. Buxton, *Extension Specialist*

*Logging*



**Cooperative Extension Service**

University of New Hampshire

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The information in this bulletin covering prices and specifications was gathered by the New Hampshire County Extension Foresters and the Utilization and Marketing Specialists. The bulletin was prepared by:

David L. Buxton  
Extension Specialist  
Logging  
862-1028

Nicholas Engalichev  
Extension Specialist, Forest Products  
Marketing and Utilization  
862-1028

## COUNTY EXTENSION FORESTERS' OFFICES

**Belknap County**  
Sumner Dole III  
Extension Office  
Beacon St. East, Box 368  
Laconia, N.H. 03246  
524-1737

**Carroll County**  
Peter W. Pohl  
Extension Office  
Main St., Box 367  
Conway, N.H. 03818  
447-5922

**Cheshire County**  
Marshall Patmos  
Stephen A. Wood  
P.O. Box 798, 800 Park Ave.  
Keene, N.H. 03431  
352-4550

**Coos County**  
Dana Blais  
Extension Office  
148 Main St.  
Lancaster, N.H. 03584  
788-4961

**Grafton County**  
Robert Burke  
Northam D. Parr  
Box 191, Woodsville, N.H. 03785  
787-6944

Arthur G. Dodge, Jr., Program Leader  
Petee Hall, University of New Hampshire  
Durham, N.H. 03824 862-1028  
or  
Division of Forests and Lands  
State House Annex, Box 856  
Concord, N.H. 03301 271-2214

**Hillsboro County**  
John Ferguson, Jr.  
Karen Bennett  
Extension Office  
Chappell Professional Center  
Route 13, South  
Milford, N.H. 03055  
673-2510

**Merrimack County**  
John A. Conde  
Norman Cushman  
Extension Service Center  
RFD#7, Box 9  
Penacook, N.H. 03303  
225-5505 or 796-2151

**Rockingham County**  
Philip Auger  
Brooks McCandlish  
Extension Service Center  
Brentwood, N.H.  
P.O. Box 200  
Epping, N.H. 03042  
679-5616

**Strafford County**  
Donald C. Black  
Extension Office  
Administration and Justice Building  
County Farm Rd., Dover, N.H. 03820  
749-4445

**Sullivan County**  
Joseph A. Szymujko  
Stephen A. Wood  
45 Crescent St.  
Claremont, N.H. 03743  
543-3181

Stanley W. Knowles  
Extension Specialist - Forestry  
862-1028

## MARKET SITUATION — 1984

Few products are consumed by individuals in the form in which they are initially manufactured. Instead, most move to various major markets where they are remanufactured or made a part of a product that is ultimately used by individual consumers. Thus, although consumer demand is the underlying force, direct demand for timber products is largely determined by the levels of activity in their primary end-use markets. Activity in most major timber markets increased fairly rapidly through 1983.

Trends in new construction, the largest market for lumber and plywood, vary somewhat with the type of construction. Production of new housing units, which accounts for over a third of the total annual consumption of softwood lumber and plywood, and for substantial amounts of the other major timber products, moved up strongly in 1983.

Analysts' estimates of 1984 housing starts vary, however, most currently see new home construction and sales continuing on an uptrend, but somewhat constrained by high interest rates. Mobile home shipments are expected to follow the same general trends.

The index of industrial output - an important indicator of the demand for pallet lumber, container board, and some grades of paper - rose to a seasonally adjusted value of 153.7 (1967=100) in September. This was 1.5 percent above the index for August, and a continuation of the strong upward trend in evidence since the low reached in November 1982. Output of the furniture and fixtures industry - a major market for hardwood lumber, particleboard, and plywood - also increased rapidly. Container production, an important paperboard, has been rising since late in 1982.

In summation, recent trends in the domestic markets for most timber products have been upward with good prospects for continued though possibly somewhat slower growth in 1984.

The United States is the world's leading importer of timber products -chiefly lumber, wood pulp, and paper and board from Canada and veneer and plywood from southeast Asia. In terms of roundwood equivalent, more than a fifth of our apparent consumption of timber products has been imported in most recent years.

The United States is also a major timber products exporter. Although we ship a variety of wood products to many countries, our principal export markets are Japan for softwood logs and lumber, pulp chips, wood pulp, and paper and board products, and western Europe for wood pulp, paper and board products, and lumber and plywood. International demand for many U.S. timber products, which had been gradually trending up in the late 1970's, began to decline in 1980 as economic growth slowed in our major overseas markets. These trends have continued through mid-1983. The outlook for international trade appears somewhat improved for most products in 1984. International wood products specialists expect a continued improvement in 1984 if the economies of our major trading partners improve.

## **Softwood Lumber**

Present expectations about housing and other important markets indicate that a rise in production, imports, and consumption is likely in 1984. Exports are also expected to increase.

On the strength of rising demand, softwood lumber prices increased rapidly in 1983 and a further uptrend is expected in 1984, provided interest rates do not rise.

## **Hardwood Lumber**

Because of the increased activity in its major markets, hardwood lumber production, orders, and shipments during 1983 were sharply above 1982 levels. Apparent hardwood lumber consumption in 1983, based on the above estimates of production and trade, is estimated at 5.4 billion board feet, 17 percent above 1982. Imports and exports are also expected to show a small rise.

In contrast to softwoods, hardwood lumber prices, as measured by the producer price index, have trended steadily up in 1983. Some further increases can be expected in 1984, if demand continues as expected.

## **Pulpwood**

At the end of 1983, paper and board consumption and production and, consequently, wood pulp consumption and production were strongly above the year-earlier pace. In 1983, production of wood pulp - which currently constitutes about 78 percent of the fiber raw material consumed in the U.S. paper and board mills - was about 4 percent above 1982 production. For many grades of paper and board, production and shipments were at all-time high rates through August, with the exception of no appreciable downturn in the months ahead. Consequently, pulpwood production (roundwood and chips) is expected to rise about 8 percent to 90.0 million cords, a new record volume. Prospective increases in economic activity suggest that consumption and production are likely to rise in 1984.

## **Fuelwood**

Current estimates indicate that fuelwood consumed for domestic heating and cooking has risen to more than 42.0 million cords per year in the early 1980's. Various surveys of the forest industries indicate that there have also been large increases in the consumption of fuelwood for industrial heat and power generation in the last few years. Most of the growth in use by the forest industries has resulted from increased utilization of logging and mill residues.

# 1984 PRICE RANGE FOR FOREST PRODUCTS

## Table I. Price Range Standing Timber (Stumpage) and Sawlogs Per Thousand Board Feet (MBF)

Prices quoted are an average range for the county. Prices will vary from those quoted depending on market conditions. More specific prices can be obtained by contacting the County Forester, Consulting Foresters, or industry representatives. Read carefully guidelines in the preceeding section of this publication before disposing of stumpage, logs, and other forest products.

### Belknap County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$40-50	(1) (2)	\$90-105
	Medium	55-65		125-145
	High	70-90 +		155-180 +
Hemlock/Red Pine	All Grades	30-45		85-120
Red Oak	Low	30-50		120-140
	Medium	75-130		220-280
	High	175-220		300-450 +
White Birch		50-90		130-200
Sugar Maple		60-90		140-200
White Ash		60-150		140-400 +
Beech		30-50		100-145
Pallet, Tie and Lower grades of mixed hardwood		25-35		90-125
Firewood/Hardwood pulp	per cord	7-12		
Softwood Pulp	per ton	1.00-3.00		
Biomass	per ton	0.00-1.00		

#### Notes:

- (1) Trucking charges per MBF are approximately \$18/MBF for the first ten miles and \$.40/MBF for each additional loaded mile.  
 (2) Logging costs (felling and yarding) for softwoods is between \$35-\$55 + /MBF and for hardwoods between \$45-\$65 + /MBF.

### Carroll County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$40	\$75	\$90-100
	Medium	70	80-115	100-130
	High	80-100	115-140	150-180
Hemlock	Medium	20-35	60-80	90-110
	High	35-45	80-100	110-130
Spruce	Medium	30-60	85-100	110-120
	High	60-75	100-120	120-150
Ash	Medium	40-60	90-150	135-150
	High	60-90	150-200	250-350
Basswood	Medium	25-50	50-80	85-150



**Carroll County (Continued)**

<b>Species</b>	<b>Quality</b>	<b>Stumpage</b>	<b>Roadside</b>	<b>Delivered</b>
Beech	Low	\$20	\$45	\$60
	Medium	25-30	50-80	65-80
	High	35-60	80-135	130-150
Beech Boltwood	High	20	30-35	70-90
Red Maple	Low to High	20-40	70	80-170
Sugar Maple	Low	25	60	80
	Medium	40	90	130
	High	70-90	110-140	135-240
Sugar Maple Boltwood				\$60/cord
Paper Birch	Low	\$60	\$90	120-140
	Medium	75	120	140-160
	High	90-100	150	160-180
Paper Birch Boltwood	Medium	30/cord	40-50/cord	70-100/cord
Yellow Birch	Medium	50	65-70	80-90
	High	90	90-140	160-250
	Low	30-40	50-60	90-110
Oak	Medium	60-100	140-200	200-300
	High	100-200	200-350	350-500

**Cheshire County**

<b>Species</b>	<b>Quality</b>	<b>Stumpage</b>	<b>Roadside</b>	<b>Delivered</b>
White Pine	Sawlog	\$55-85	\$70-110	\$110-150 +
Red Pine	Sawlog	35-50	80-90	95-135
Hemlock	Sawlog	25-45	55-70	85-110
Spruce	Sawlog	25-45	60-75	90-110
Beech	Sawlog	25-50	50-85	90-125
Poplar	Sawlog	25-50	65-85	90-115
Red Maple	Sawlog	30-50	60-85	90-130
Red Oak	Sawlog	150-220 +	170-250 +	200-450 +
Sugar Maple	Sawlog	60-120	90-160	100-225
White Ash	Sawlog	80-160	95-200	125-325 +
White Oak	Sawlog	60-120	100-170	120-200 +
White Birch	Sawlog	50-85	100-160	125-180
	Boltwood	20-30/cord	40-60/cord	60-80/cord
Yellow & Black Birch	Sawlog	50-120	90-160	100-120 +
	Boltwood	20-30/cord	40-55/cord	60-70/cord
Mixed Hardwood	Pallet	25-40	50-70	90-120
	Tie Log	25-40	50-70	95-120

## Coos County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Sawlog	\$50-80	\$105-130	\$155-180
Spruce-Fir	Sawlog	40-55	100-125	145-165
Hemlock	Sawlog	20-35	65-90	110-125
Hard Maple	Sawlog	60-85	115-170	140-220
Cherry	Sawlog	70-90	170-190	200-275
Soft (Red) Maple	Sawlog	20-40	60-90	100-130
Poplar	Sawlog	20-40	55-70	100-130
White Birch	Sawlog	60-90	110-160	175-235
	Boltwood	20-45/cord		
Beech	Sawlog	20-40	70-90	100-140
Yellow Birch	Sawlog	70-100	125-180	175-260
White Ash	Sawlog	70-110	110-200	140-300
Red Oak	Sawlog	70-100	130-180	180-300
Basswood	Sawlog	40-70	100-120	120-160
Mixed Hardwood (Pallet & Tie Stock)	Sawlogs	20-40	70-90	100-130
White Cedar	8' logs/cord	20-30	60-90	100-160

8' cord = 1000 bd. ft. (approx.)

Note: Veneer Grade and high quality sawlogs have significantly higher values than the prices listed above.

## Grafton County

Species	Stumpage	Roadside	Mill
White Pine	\$65-95	\$80-120	\$90-220
Hemlock	25-45	60-90	85-140
Spruce-Fir	35-50	80-95	105-145
Yellow Birch	65-100	120-180	150-200
Sugar Maple	60-95	125-180	125-200
White Birch	60-90	145-165	125-230
Red Maple	25-40	80-100	110-160
White Ash	110-190	150-235	170-350 +
Beech	20-30	80-90	100-130
Red Oak	125-200	170-265	140-525
Red Pine	30-40	80-90	85-135
Poplar	20-30	80	90-120
Pallet Mxd.	20-35	80-90	80-110

### Hillsborough County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$50-55	\$80-90	\$90-110
	Medium	60-70	100-110	115-125
	High	75-85	115-120	130-150
Hemlock	Low	30-35	70-75	80-90
	High	40-45	85-90	100-110
Red Oak & White Ash	Low	65-70	90-100	115-125
	Medium	100-120	140-160	170-190
	High	150-175	200-250	250-300
Other Hardwoods				
Birch, Maple	Low	35-45	70-90	95-110
Mixed Hardwood (Pallet Stock)	High Logs	85-100	150-200	200+ 90-115

### Merrimack County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$40-50	\$80-90	\$90-110
	Medium	50-60	90-100	110-135
	High	60-90	90-120	125-185 +
Hemlock	Low	20-25	60-65	80-85
	High	25-40	65-75	85-95
White Birch	Medium	40-50	90-100	100-140
	High	50-60	120-130	160-170
Hard Maple	Medium	50-60	90-100	105-115
	High	60-70	100-110	115-125
White Ash	Medium	60-90	100-130	115-150
	High	90-125	130-165	165-275
Red Oak	Medium	60-90	150-200	180-225
	High	90-150	200-300	275-375 +
Pallet Stock	Logs	25-40	75-85	95-125
Mixed Hardwood				
Pulp Logs				\$12-18/ton
Hemlock Pulp				16-18/ton
Spruce Pulp				18-29/ton

### Rockingham County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$45	\$80	\$95
	Medium	65	100	120
	High	80 +	115 +	140 +
Hemlock	Low	40	80	95
	High	60	100	115
Red & White Oak	Medium	100	145	175
	High	200 +	250	300

### Strafford County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low - Medium	\$50-65	\$90-110	\$130-150
	High	65-90	110-125	140-160
Hemlock	Low - Medium	25-40	60-75	110-120
	High	40-50	75-85	115-130
Red Oak	Low - Medium	75-100	110-140	140-160
	High	150-300	195-345	210-240
Other Hardwoods	Low - Medium	40-70	95-115	125-145
	High	100-125	145-160	180-195

### Sullivan County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$50-55	\$80-95	\$115-125
	Medium	55-70	105-115	130-145
	High	70-90	115-130	145-175
Hemlock	Medium	25-35	70-80	100-110
	High	35-45	80-90	110-120
Spruce	Medium	25-35	70-80	100-110
	High	35-45	80-90	110-120
Yellow & Black Birch	Medium	60-65	120-125	150-155
	High	65-75	125-135	155-165
White Birch	Medium	40-50	100-110	130-140
	High	50-60	110-120	140-150
Sugar Maple	Medium	50-60	110-120	140-150
	High	65-75	120-135	150-165
Red Oak	Medium	75-200	235-260	265-290
	High	200-250	260-310	290-340 +
White Ash	Medium	125-150	185-210	215-240 +
	High	150-200	210-260	240-290 +
Red Maple	Medium	25-30	80-85	105-110
	High	30-40	85-95	110-120
Pallet		20-30	70-80	95-120
Other Hardwoods		15-30	65-80	90-105

**Table II. Prices Pulpwood Per Cord\* — Northern New Hampshire**

Species	Stumpage	Roadside	Mill Yard
Spruce and Fir	\$7.00-10.00	\$35.00-40.00	\$46.00-52.00
Hemlock, White Pine	4.00-6.00	27.00-33.00	40.00-43.00
Tamarack, Red Pine	4.00-6.00	27.00-33.00	40.00-43.00
Hardwood	5.00-8.00	24.00-30.00	45.00-50.00
Fuelwood (residential)	6.00-10.00		

\*Pulpwood is weight scaled at the mills in green ton equivalents. Converting factors to cords vary according to species.

**Prices of Pulpwood Per Cord — Central New Hampshire<sup>2</sup>**

Species	Stumpage		Delivered
Softwood Pulp Random Length			
Pine	\$3.00-6.00	\$14.35-15.35/Ton or	\$31.00-32.00/cord
Hemlock	8.00-15.00	15.83-16.31/Ton or	35.00-45.00/cord
Spruce and Fir	3.00-6.00	16.63-17.62/Ton or	36.00-37.00/cord
Hardwood Pulp Random Length			
Mixed Hardwood	5.00-11.00	16.00-17.00/Ton or	43.00-44.00/cord

**Prices of Pulpwood Per Cord — Southern New Hampshire<sup>2</sup>**

Species	Stumpage	Roadside	Delivered at Mill
Softwood Pulp	1.00-1.50/Ton	12.00-26.00/Ton	17.00-31.00/Ton
	2.25-4.00/Cord	35.00-55.00/Cord	48.00-70.00/Cord
Random Length Softwood	3.00-5.00		10.00-16.50/Ton
8' Long Pulpwood-Softwood			19.00/Ton

**Table III. Price of Debarked Slabs and Edgings Per Green Ton Strapped**

	Delivered to Chipping Plant
Softwood <sup>1</sup> (mixed)	\$6.50-7.00
Hardwood (mixed)	6.00-7.00

<sup>1</sup>Special prices are paid for slabs and edgings sorted by species (spruce and fir).

<sup>2</sup>Contact buyers for exact prices and mileage allowances.

**Price of Pulp Chips<sup>1 2</sup>**

	Produced from Slabs and Edgings		Average
	FOB Sawmill /Green Ton	Delivered to Pulp Mill /Green Ton	
Pine and Hemlock	\$12.50	\$20.00-27.00	22.00
Spruce and Fir	12.00-14.50	23.00-30.00	26.00
Hardwood (mixed)	10.50-13.50	18.50-25.00	23.00

<sup>1</sup>Chips are bought by weight or by volume.

<sup>2</sup>Contact buyers for exact prices and mileage allowances.

**Average Price of Total Tree Chips and Fuel Chips**

	<b>Spout Prices</b> <small>(including stumpage)</small>	<b>Delivered</b>	<b>Average</b>
Pulp quality: Hardwood	\$13.50-15.00	Depending on distance	
Softwood	13.00-15.00		
Fuel quality: Mixed Species (Biomass)	\$12.00-13.00	\$14.00-25.00 New England markets	\$20.00

**Table IV. Price Range Boltwood, Posts, Railroad Cross Ties, and Switch Ties**

Species	Stumpage	Roadside	Delivered at Mill
	<b>Boltwood Per Cord<sup>1</sup></b>		
White Birch	\$30.00-35.00	\$50.00-70.00	\$75.00-106.00 per cord
Beech	10.00-15.00		50.00-60.00 per cord
Sugar Maple and Ash	25.00-30.00		60.00-100.00 per cord
Yellow Birch	20.00-30.00	40.00-50.00	60.00-75.00 per cord

<sup>1</sup>Price per cord varies according to diameter and length of bolt. Some mills prefer to buy by the Mbf.

**Guardrail Posts**

Species	Min. Small End Diameter	Max. Large End Diameter	Length	Delivered
Red Pine				
Pitch Pine	5"	10"	7' or Multiples	\$1.00-1.35 ea.
White Pine				
Spruce				

**Railroad Crossties**

Grade	Size	Green Mixed Hardwood Ties <sup>1</sup> F.O.B. Mill
		per MBF
3	(6" × 8" × 8'6")	\$191 - 200
4	(7" × 8" × 8'6")	205 - 215
5	(7" × 9" × 8'6")	206 - 270

**Switch Ties (mixed hardwood)<sup>1</sup>**

(7" × 9")	9'-12' long	\$210 per MBF +
(7" × 9")	13'-16' long	220 per MBF +

<sup>1</sup>Oak, Beech, Birch, Maple, Cherry, Ash, Hickory

**Table V. Price Range of Hardwood Fuelwood Per Cord**

Species	Stumpage	Roadside	Delivered Buyers Premises
Hardwood	} \$7.00-15.00		
4' Wood		\$40.00-65.00	\$50.00-80.00
12", 14", 16" Lengths		60.00-80.00	65.00-95.00+
Slabs (Hardwood or Softwood)		20.00-25.00	25.00-55.00
Tree length loads of cordwood			
Southern N.H.	7.00-15.00	37.00-40.00	50.00-55.00
Northern N.H.	6.00-10.00	32.00-35.00	40.00-42.00

**Table VI. Price Range of Sawdust and Shavings and Bark**

	Per-Cord Green at Sawmill	Per Bale - Dry
Sawdust	\$6.00-18.00 6.00-18.00 per Ton	
Shavings	5.00-15.00	\$1.50-2.50
Bagged Dry Shavings		1.50-2.50
Bark	3.50-12.00 per yard (loaded) or 12-14.50 per Ton	

**Table VIIA. Representative Operating Costs (Contract Prices) Northern N.H.**

Sawlogs: Felling and Limbing	\$15 and up per MBF
Yarding and Bucking (softwood)	30-35 per MBF
(hardwood)	35-40 per MBF
Felling, Yarding and Bucking (softwood)	45-50 per MBF
(hardwood)	50-70 per MBF
Pulpwood and Cordwood: (with machine) stump to roadside	
Random length	25-30 per cord

**Table VIIB. Representative Operating Costs (Contract Prices) Southern N.H.**

Sawlogs: Felling and Limbing	\$9-12 per MBF
Yarding and Bucking (softwood)	25-30 per MBF
(hardwood)	30-35 per MBF
Felling, Yard and Bucking (softwood)	40-45 per MBF
(hardwood)	45-60 per MBF
Pulpwood and Cordwood: (with machine) stump to roadside	
Random length	25-30 per cord

**Table VIIC. Representative Processing Costs (Contract Prices) Average for N.H.**

Custom Sawing —	
Softwood	\$100.00-110.00 per MBF or \$100.00-120.00 per hour
Hardwood	125-150+ per MBF or 100.00-125.00 per hour
Planing	35.00+ per MBF 2 sides, 50.00 per MBF 4 sides, patterns extra
Resawing	30.00-40.00+ per MBF

**Table VIID. Representative Kiln Drying Costs (Custom)**

4/4 Pine (Yard)	12-14% MC	\$70.00-75.00
4/4 Pine - Furniture	6-8% MC	80.00-85.00
4/4 Oak - Furniture	6-8% MC	140.00-150.00
4/4 Maple - Furniture	6-8% MC	90.00-95.00

**Table VIIE. Representative Trucking Costs\* (Trucks with Loaders)**

Sawlogs: Local Deliveries	\$18.00 per MBF
Distant Deliveries	18.00 for the first 10 miles and 40¢ for each additional mile.
	OR
	35.00 per hour
Cordwood and Pulpwood:	100.00 per load
Lumber and Chips:	1.80-2.00 per loaded mile

\*For short hauls or partial loads minimum charges may apply

**Table VIII. Wholesale Price Range<sup>1</sup> of Christmas Trees and Boughs<sup>2</sup>**

	Stumpage per Tree	Roadside per Tree	
Pasture Run (unimproved)			
Balsam Fir	\$1.50-4.00	\$3.25-4.25	\$5.25-8.00
Spruce	1.50-3.25	3.00-3.75	4.00-7.00
Improved (but not sheared)			
Balsam	4.00-6.00	5.50-8.00	
Spruce	3.00-4.50	4.50-7.00	
Sheared			
Balsam	7.00-10.00	8.50-14.00 to \$2.00 per foot	
Spruce	4.50-7.00	7.00-11.00	
Scotch Pine	5.50-7.50	8.50-12.00	
		Roadside	
Boughs (baled or tied)	Per Bundle <sup>3</sup>		Per Ton
Balsam Fir	3.50-6.00		135.00-250.00
Spruce	2.75-5.00		110.00-200.00
Pine	3.00-5.00		120.00-200.00
Wreaths			
Balsam Fir - size 12''-14''			
Single face	2.25-2.75		
Double face	2.75-3.50		

<sup>1</sup>Prices vary according to size of order, quality, grade and tree size.

<sup>2</sup>Producers should contact buyers well in advance of cutting and arrange for deposits and specific prices, and use a written contract.

<sup>3</sup>Price based on 50 lb. bundle. Prices vary with quality and quantity.



**Table IX. Retail Price Range of Single Christmas Trees**

(Select and cut your own)	
Scotch Pine	
Balsam Fir	
White Spruce	\$10.00-20.00 or \$2.00-3.00 per lineal foot
Douglas Fir	
Norway Spruce	
Blue Spruce	

### CHRISTMAS TREE SITUATION

New England harvests about 13% of the Christmas trees marketed annually in the United States, according to Donald L. McNeil of the National Christmas Tree Association. The largest producing states, he said, are Michigan, Wisconsin and Minnesota, followed closely by Oregon and Washington. Last year, the average U.S. Christmas tree retailed for \$18.75.

While nationally, Scotch pines, Douglas firs and balsams continue to be the top three choices of consumers, residents in the Northeast favor balsams, white spruces and Scotch pines, in that order.

The multi-million dollar Christmas tree industry in New Hampshire continues its ten-year trend of having demand far exceed supply for high quality trees. In response to the demand, the 200 or more growers throughout the State continue to replenish their stock through annual plantings.

The majority of large-scale wholesale producers are continually sold out of their better trees by late summer while the cut-your-own operations, both small and large, are experiencing unprecedented success in the market.

Pest problems such as balsam twig aphid, gall midge, needle casts, rusts, and the like are still concerns of the growers, but as yet have not had a significant impact on the industry.

Demand for the unimproved, pasture-run tree continues to dwindle with the majority of the trees being improved or sheared.

Balsam fir continues to be the staple of the industry in the Northeast market. Sheared spruce and Scotch pine are also very popular.

Prices have met or exceeded inflation with the consumer always willing to pay for a high quality product.

Brush and wreath demand remains high with an opportunity for expansion in production.

The New Hampshire Christmas tree industry remains strong and healthy with excellent prospects for expansion and stability in the future.

**Table X. Average Maple Sap Prices at Sugar House in New Hampshire**

% Sugar	¢/gal.	% sugar	¢/gal.
0-1.1	0	3.2	21.6
1.2	1.0	3.3	22.4
1.3	2.0	3.4	23.2
1.4	3.5	3.5	24.1
1.5	5.2	3.6	25.0
1.6	6.7	3.7	26.0
1.7	8.1	3.8	27.0
1.8	9.5	3.9	28.0
1.9	10.8	4.0	29.0
2.0	12.0	4.1	30.0
2.1	12.8	4.2	31.0
2.2	13.6	4.3	32.0
2.3	14.4	4.4	33.0
2.4	15.2	4.5	34.0
2.5	16.0	4.6	35.0
2.6	16.8	4.7	36.0
2.7	17.6	4.8	37.0
2.8	18.4	4.9	38.0
2.9	19.2	5.0	39.0
3.0	20.0	5.1	40.0
3.1	20.8	5.2	41.0
		5.3	42.0
		5.4	43.0

**Table XI. Prices for Table Grade Maple Syrup and Products at Producers**

	<u>Maple Syrup</u> Retail		<u>Maple Products</u> Retail
1 gallon	\$22.00	Sugar	1 lb. \$5.00-6.00
½ gallon	12.00	Creme	8 oz. 3.00-4.00
1 quart	7.00	Candy	½ lb. 4.00-4.50
1 pint	4.50		
½ pint	2.85		
Store Prices			
1 gallon	\$19.00-25.00		

**Rent Price Per Tap Hole**

10-25 cents for sugar maples in the woods and not too easy to get to;  
up to 25 cents for easily accessible trees and trees along roadsides.

**FOREST PRODUCTS LABORATORY PUBLICATION LISTS**

LISTS OF PUBLICATIONS dealing with research projects of the U.S. Forest Products Laboratory or relating to special interest groups are available from the Director, Forest Products Laboratory, P.O. Box 5130, Madison, Wis. 53705. Separate lists have been compiled for each of the following subjects: Box Crate, and Packaging Data; Drying of Wood; Fire Protection; Glue and Plywood; Growth, Structure and Identification of Wood; Furniture Manufacture; Logging, Milling and Utilization of Timber Products; Mechanical Properties of Timber; Structural Sandwich; Plastic Laminates and Wood-Base Components; Thermal Properties of Wood; Wood Finishing Subjects; Wood Preservation; Architects, Builders and Engineers.

# CONVERSION FACTORS AND UNITS OF MEASUREMENT FOR PRODUCTS PRODUCTS

A knowledge of the common units of measure for the various forest products is of importance to persons involved in the marketing process. These units of measure form a basis for common understanding between buyer and seller. Familiarity with these units can mean a greater financial return and a reduction of the chances of misunderstanding of the terms of forest products sale agreements.

The Blodgett rule is the official standard in New Hampshire. Several other rules are also in use by mutual agreement between buyer and seller. However, the International Rule, ¼" kerf, is most commonly accepted.

The volume of a standing tree or log is determined using tree and log rules. These rules simply give the approximate number of board feet of sawed lumber that may be manufactured after allowed for milling losses in slabs, edgings and sawdust.

## Tree Scale (Tree Volume Measurement)

To determine the board foot content of standing trees, tally the trees by:

- 1) D.B.H. (Diameter Breast Height = measurement of diameter of tree 4½ ft. above ground)
- 2) Estimate the number of 16 foot logs to 6 inch top diameter
- 3) Apply the scale given in Table below

**Tree Scale — International Rule**

D.B.H. Inches	Number of 16 foot logs — to 6" top						
	1	1½	2	2½	3	3½	4
6	10	15					
8	20	35	50				
10	40	55	70	85	95		
12	60	75	95	110	125	145	165
14	85	110	135	150	165	190	215
16	110	150	190	215	240	260	285
18	140	195	245	285	320	345	370
20	180	245	310	355	400	435	465
22	220	300	380	445	505	545	585
24	270	365	460	540	615	670	730
26	320	435	550	645	735	805	875
28	370	515	655	760	870	950	1035
30	430	595	760	885	1010	1110	1205

## Log Rule

To determine the board foot content of sawlogs, tally the logs by:

- 1) Average Diameters at the small end and inside the bark and by lengths
- 2) Apply volumes from the table given in Table below and total

### The International Log Rule

¼-inch Saw Kerf

Diameter (Small end inside bark) Inches	Length of Log in Feet						
	8	10	12	14	16	18	20
4		5	5	5	5	5	10
5	5	5	10	10	10	15	15
6	10	10	15	15	20	25	25
7	10	15	20	25	30	35	40
8	15	20	25	35	40	45	50
9	20	30	35	45	50	60	70
10	30	35	45	55	65	75	85
11	35	45	55	70	80	95	105
12	45	55	70	85	95	110	125
13	55	70	85	100	115	135	150
14	65	80	100	115	135	155	175
15	75	95	115	135	160	180	205
16	85	110	130	155	180	205	235
17	95	125	150	180	205	235	265
18	110	140	170	200	230	265	300
19	125	155	190	225	260	300	335
20	135	175	210	250	290	300	370
21	155	195	235	285	320	365	410
22	170	215	260	305	355	405	455
23	185	235	285	335	390	445	495
24	205	255	310	370	425	485	545
25	220	280	340	400	460	525	590
26	240	305	370	435	500	570	640
27	260	330	400	470	540	615	690
28	280	355	430	510	585	665	745
29	305	385	465	545	630	715	800
30	325	410	495	585	675	765	860

## Pulpwood

Pulpwood is generally sold by the cord or on the weight basis.

*The Cord:* A standard cord is generally accepted as equivalent to a pile of closely stacked wood 4 feet high, 4 feet deep and 8 feet long containing a gross volume of 128 cu. ft.

## Solid Wood Content of a Cord

The solid wood content of a cord of pulpwood is dependent on many factors such as:

- 1) The average diameter of the bolts
- 2) Tightness of piling
- 3) Limbing practice and knottiness
- 4) Taper and straightness of individual bolts
- 5) Amount of bark rubbed off prior to scaling
- 6) Period of time between piling and scaling (shrinkage and compaction during transportation)

The volume given in the Table below are *averages* and are commonly used as conversion factors.

### Solid Wood Content of a Standard Cord

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1 Standard cord (4'x4'x8')	=	128 cubic feet of wood, bark and air spaces
1 Standard cord of pulpwood, rough	=	85 cubic feet of solid wood (softwood)
1 Standard cord of pulpwood, peeled	=	95 cubic feet of solid wood (softwood)
1 Standard cord of pulpwood, rough	=	85 cubic feet of solid wood (hardwood)
1 Standard cord of pulpwood, peeled	=	95 cubic feet of solid wood (hardwood)
1.7 to 2.0 cord	=	1000 board feet

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When green rough pulpwood is purchased by weight, the following weight-volume equivalents are generally accepted:

5600 - 5700 pounds = 1 cord (hardwood)

4300 - 4700 pounds = 1 cord (softwood)

## Cordwood

Wood fuel is generally sold by the standard cord which is a pile of wood 8 feet long, 4 feet high and 4 feet wide containing a gross volume of 128 cubic feet.

A standard cord of fuelwood consisting of round 4 foot sticks fitting into a 4'x4'x8' space, when cut into 16 inch lengths, split and piled, will generally stack to occupy 100 to 105 cubic feet. A "thrown in" cord of 16" cut and split wood will generally occupy a volume of 150 to 160 cubic feet.

### Approximate Stacked Volume of a Cord of Wood, Cut and Split

Length	Approximate Cu. Ft.	Approximate Percent Shrinkage from 128 Cu. Ft.
48"	128	0
24"	110-113	12
16"	103-107	16
12"	100-103	20

### Approximate Weight and Heating Value Per Cord (80 cu. ft.) of Different Woods, Green and Air Dry (Approximately 20% Moisture Content)

Woods	Weight, lb. per cu. ft.	Weight, lb. Air Dry	Available Heat, Million BTU <sup>1</sup>	Equivalent in Gallons of Fuel Oil <sup>2</sup>
	Green		Air Dry	
Ash	48	3,440	20.0	204
Aspen	43	2,160	12.5	128
Beech, American	54	3,760	21.8	222
Birch, yellow	57	3,680	21.3	217
Elm, American	54	2,900	17.2	176
Hickory, shagbark	63	4,240	24.6	251
Maple, red	50	3,200	18.6	190
Maple, sugar	56	3,680	21.3	217
Oak, red	64	3,680	21.3	217
Oak, white	63	3,920	22.7	232
Pine, eastern white	36	2,080	12.0	123

<sup>1</sup>50 to 60% efficiency of burning unit.

<sup>2</sup>70% efficiency of furnace.

### Variation of Heating Values of Wood Due to Moisture

— Percent of Moisture —	— Percent of Usable Heat —
0 (oven dry)	103.4%
4	102.7
20 Air-dried Hardwood	100.00 7,250 BTU*
40	96.5
80	89.7
100 (Green hardwood)	85.0

\*BTU is the quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit.

**Approximate Number of Trees per Cord  
for Peeled Pulpwood and Cordwood**

Tree Diameter at 4½ Feet	Number of Trees
5"	50
6"	25
7"	16
8"	12
9"	10
10"	8
11"	6
12"	5
14"	3
16"	2.5
18"	2
22"	1

**Calculated Sawdust Weights in Pounds Per Cubic Foot  
at Selected Moisture Contents.<sup>1</sup>**

Moisture Content Level		Species and Compaction Classes							
		White Pine			Red Oak			Red Maple	
Percent	Percent	Light	Shaken	Packed	Light	Shaken	Packed	Light	Shaken
Oven-dry	Green Basis	7.7	9.7	13.2	11.0	13.9	16.8	8.9	12.2
5	4.8	8.1	10.2	13.7	11.5	14.6	17.3	9.3	12.8
10	9.1	8.5	10.7	14.0	12.1	15.3	17.7	9.8	13.4
15	13.0	8.8	11.1	14.5	12.6	16.0	18.3	10.2	14.0
20	16.6	9.2	11.6	14.9	13.2	16.7	18.9	10.7	14.6
25	20.0	9.6	12.1	15.2	13.7	17.4	19.5	11.1	15.2
30	23.1	10.0	12.6	15.5	14.3	18.1	20.0	11.6	15.9
50	33.3	11.5	14.5	17.3	16.5	20.8	22.8	13.3	18.3
75	42.8	13.5	17.0	19.5	19.2	24.3	26.2	15.6	21.3
100	50.0	15.4	19.4	22.0	22.0	27.8	31.0	17.8	24.4
125	55.5	17.3	21.8	25.0	24.7	31.3	36.0	20.0	27.4
140	58.3	18.5	23.3	27.1	26.4	33.3	40.0	21.4	29.3

<sup>1</sup>Weights by each compaction class are mean values calculated to be within ± ½ pound of the true mean value at the 95 percent confidence level.

**Railroad Tie Volume Table**

Grade	Dimensions	Bd. ft. volume per tie	No. of Pcs. per MBF
1	6"×7"×8'6"	29.7	33.7
2	6"×7"×8'6"	29.7	33.7
3	6"×8"×8'6"	34.0	29.4
4	7"×8"×8'6"	39.6	25.2
5	7"×9"×8'6"	44.6	22.4

## Lumber (Square Edge)

The standard unit of measure for lumber is the board foot. It is equivalent to 1/12 of a cubic foot such as a board 12 inches by 12 inches and 1 inch thick.

Board foot measurements refer to rough lumber. Surfaced lumber is tallied on the basis of width and thickness before surfacing.

To calculate the board footage of lumber, for each piece multiply the width in inches by the thickness by the length in feet and divide by 12.

Example:

$$\frac{6'' \text{ wide} \times 2'' \text{ thick} \times 16' \text{ long}}{12} = 16 \text{ board feet}$$

### Board Foot Measure Contained in Lumber

Thickness and Width Inches	Board foot content Board Length in feet					
	6	8	10	12	14	16
1 × 2	1	1-1/3	1-2/3	2	2-1/3	2-2/3
1 × 3	1-1/2	2	2-1/2	3	3-1/2	4
1 × 4	2	2-2/3	3-1/2	4	4-2/3	5-1/3
1 × 5	2-1/2	3-1/3	4-1/6	5	5-5/6	5-2/3
1 × 6	3	4	5	6	7	8
1 × 7	3-1/2	4-2/3	5-5/6	7	8-1/6	9-1/3
1 × 8	4	5-1/3	6-2/3	8	9-1/3	10-2/3
1 × 10	5	6-2/3	8-1/3	10	11-2/3	13-1/3
1 × 12	6	8	10	12	14	16
1¼ × 4	2-1/2	3-1/3	4-1/6	5	5-5/6	6-2/3
1¼ × 6	3-3/4	5	6-1/4	7-1/2	8-3/4	10
1¼ × 8	5	6-2/3	8-1/3	10	11-2/3	13-1/3
1½ × 4	3	4	5	6	7	8
1½ × 6	4-1/2	6	7-1/2	9	10-1/2	12
1½ × 8	6	8	10	12	14	16
2 × 4	4	5-1/3	6-2/3	8	9-1/3	10-2/3
2 × 6	6	8	10	12	14	16
2 × 8	8	10-2/3	11-1/3	16	18-2/3	21-1/3
2 × 10	10	13-1/3	16-2/3	20	23-1/3	26-2/3
2 × 12	12	16	20	24	28	32
2½ × 12	15	20	25	30	35	40
3 × 6	9	12	15	18	21	24
3 × 8	12	16	20	24	28	32
3 × 10	15	20	25	30	35	40
3 × 12	18	24	30	36	42	48
4 × 4	8	10-2/3	13-1/3	16	18-2/3	21-1/2
6 × 6	18	24	30	36	42	48



## LUMBER SIZE TABLE

### Nominal and Minimum-dressed Sizes of Boards, Dimensions and Timbers

(All Figures In Inches)

ITEM	THICKNESS			FACE WIDTHS						
	Nominal	<u>Minimum Dressed</u>		Nominal	<u>Minimum Dressed</u>					
		Dry	Green			Dry	Green			
Boards*	1	3/4	25/32	2	1-1/2	1-9/16				
				3	2-1/2	1-9/16				
				4	3-1/2	3-9/16				
				5	4-1/2	4-5/8				
				6	5-1/2	5-5/8				
				7	6-1/2	6-5/8				
				8	7-1/4	7-1/2				
				9	8-1/4	8-1/2				
				10	9-1/4	9-1/2				
				11	10-1/4	10-1/2				
				12	11-1/4	11-1/2				
				14	12-1/4	13-1/2				
				16	15-1/4	15-1/2				
				Dimension	2	1-1/2	1-9/16	2	1-1/2	1-9/16
								3	2-1/2	2-9/16
								4	3-1/2	3-9/16
5	4-1/2	4-5/8								
6	5-1/2	5-5/8								
8	7-1/4	7-1/2								
10	9-1/4	9-1/2								
12	11-1/4	11-1/2								
14	13-1/4	13-1/2								
16	15-1/4	15-1/2								
Dimension	4	3-1/2	3-9/16					2	1-1/2	1-9/16
								3	2-1/2	2-9/16
								4	3-1/2	3-9/16
								5	4-1/2	4-5/8
								6	5-1/2	5-5/8
								8	7-1/4	7-1/2
				10	9-1/4	9-1/2				
				12	11-1/4	11-1/2				
				14	13-1/4	13-1/2				
				16	15-1/4	15-1/2				
				Timbers	5 & Thicker	1/2 Off		5 & Wider	1/2 Off	

\*Boards less than the minimum thickness for 1 inch nominal but 5/8 inch or greater thickness dry (11/16 inch green) may be regarded as American Standard Lumber, but such boards shall be marked to show the size and condition of seasoning at the time of dressing. They shall also be distinguished from 1-inch boards on invoices and certificates.

*Dry Sizes* apply to lumber which has been seasoned or dried to a moisture content of 19 percent or less.

*Green Sizes* apply to lumber having a moisture content in excess of 19 percent.

## Computing of Lumber Volume in Board Feet

Take the Lineal Feet and Multiply by the Contents of One Lineal Foot.

Size of Piece	Part of Foot per Lin. Ft.	Size of Piece	Part of Foot per Lin. Ft.
1×1	1/12	4×4	1-1/3
1×2	1/6	4×5	1-2/3
1×3	1/4	4×6	2
1×4	1/3	4×7	2-1/3
1×6	1/2	4×8	2-2/3
1×8	2/3	4×9	3
1×10	5/6	4×10	3-1/3
1×12	1	4×12	4
2×2	1/3	5×5	2-1/12
2×3	1/2	6×6	3
2×4	2/3	7×7	4-1/12
2×5	5/6	8×8	5-1/3
2×6	1	9×9	6-3/4
2×7	1-1/6	10×10	8-1/3
2×8	1-1/3	11×11	10-1/12
2×9	1-1/2	12×12	12
2×10	1-2/3	14×14	16-1/3
2×11	1-5/6	15×15	18-3/4
2×12	2	16×16	21-1/3
2×13	2-1/6	17×17	24-1/12
2×14	2-1/3	18×18	27
2×15	2-1/2	19×19	30
2×16	2-2/3	20×20	33-1/3
3×3	3/4	22×22	40-1/3
3×4	1	22×24	44
3×5	1-1/4	24×24	48
3×6	1-1/2	26×26	56-1/3
3×7	1-3/4	28×28	65-1/3
3×8	2	30×30	75
3×9	2-1/4	32×32	85-1/3
3×10	2-1/2	34×34	96-1/3
3×11	2-3/4	36×36	108
3×12	3		