

NEW HAMPSHIRE FOREST MARKET REPORT 1989



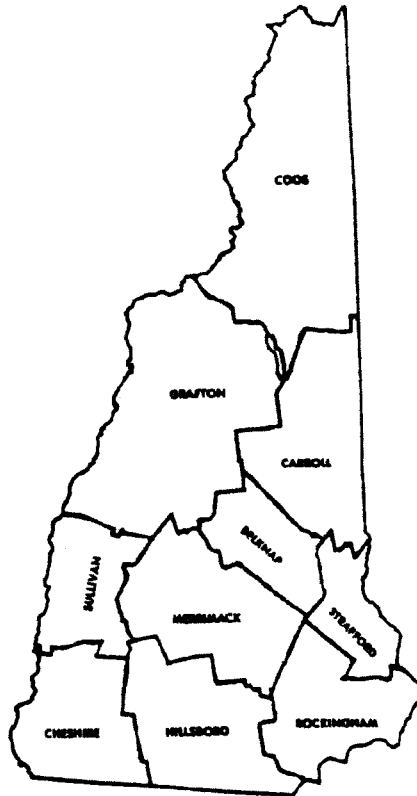
**COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF NEW HAMPSHIRE**

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



Cooperative Extension Service

University of New Hampshire

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Mail this form to: Bob Edmonds, Editor, Cooperative Extension Service,
111 Pettee Hall, University of New Hampshire, Durham, NH 03824,
(603) 862-1067.

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NEW HAMPSHIRE'S FORESTRY EXTENSION PROGRAM

The Cooperative Forestry Extension Program is conducted by County Cooperative Extension Service Foresters and by Extension Specialists based at the University of New Hampshire at Durham. These educators provide technical information to woodland owners, woods workers, community officials and processors of primary and secondary forest products.

County foresters and other specialists can provide on-site recommendations about the alternatives of managing forest stands. This includes advice about planting or naturally regenerating forest land, pruning, pre-commercial weeding and thinning, wildlife habitat improvement, recreational uses, commercial harvesting of sawlogs, pulpwood, biomass or firewood, and marketing of a wide variety of forest products.

Utilization foresters can provide business management and technical information to timber harvesters, sawmills and other wood industry businesses. This includes recommendations on production control and yield studies, taxes and insurances, personnel, safety, wood processing and lumber drying.

This is a cooperative program between the New Hampshire Cooperative Extension Service, the University of New Hampshire, the Division of Forests and Lands of the Department of Resources and Economic Development, State of New Hampshire, and the 10 New Hampshire counties.

For additional information or assistance, call the Cooperative Extension Service in Durham or the County Cooperative Extension Services Offices listed on page 3.

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:

Nicolas Engalichev
Extension Specialist, Forest Products
Marketing and Utilization
862-1029 or 862-1096

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, Jr.
Stephen A. Wood
P.O. Box 798, 800 Park Ave.
Keene, N.H. 03431

Coos County

Paul B. Crosby
Extension Office
148 Main St.
Lancaster, N.H. 03584
788-4961

Grafton County

Northam D. Parr
Box 191, Woodsville, N.H. 03785
787-6944

Hillsborough County

John Ferguson, Jr.
Jonathan W. Nute
Extension Office
Chappell Professional Center
Route 13, South
Milford, N.H. 03055
673-2510

Merrimack County

Karen P. Bennett
Extension Service Center
327 Daniel Webster Highway
Boscawen, N.H. 03303
225-5505 or 796-2151

Rockingham County

Philip A. Auger
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
24 Main Street
Newport, N.H. 03773
863-9200

Stanley W. Knowles
Extension Specialist, Forestry
862-1029 or 862-1359

John J. Kanter
Extension Specialist, Wildlife Management
862-1028 or 862-1066

MARKET SITUATION — 1988

OUTLOOK — 1989

Few timber 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 market.

General Economic Trends

The gross national product, a measure of the Nation's total output of goods and services, and the most comprehensive indicator of total economic activity, should amount to about \$3,995 billion for 1988 (1982 dollars), 3.8 percent above the average in 1987. Most analysts also expect overall growth to slow somewhat next year. For 1989, a year-to-year growth rate of about 2.5 percent, in line with several forecasts, would mean a further rise to an average of \$4,095 billion.

Major Timber Product Market Trends

Recent estimates of housing starts for 1988 fall between 1.4 million and 1.5 million units, with the current consensus at about 1.45 million — down nearly 10.5 percent from the volume started in 1987. Analysts' forecasts for 1989 have a somewhat wider range; however, most estimates point to a continued decline to about the 1.4 million level.

Repair and remodeling of residential structures, another major wood products market, apparently has slowed somewhat in 1988. Many industry observers feel that both repair and remodeling expenditures have been below year-earlier levels because of increases in interest rates, and most agree that expenditures will remain relatively slow if interest rates rise in 1989.

Total nonresidential construction activity through the first 9 months of 1988 has been slightly weaker than during the same period in 1987. A number of things are apparently responsible for the lack of growth, including, for example, lack of investment incentives under the 1987 tax laws, and past overbuilding of office and hotel and motel space in some major markets. At the present time, economists expect slightly lower levels of overall nonresidential construction activity.

Most economists currently feel that total manufacturing output and production in many industries will continue at a relatively slow pace in 1989 if economic growth weakens in the months ahead.

In summary, many of the important U.S. timber products markets have shown declines or somewhat lower rates of growth over the first three quarters of 1988 than in 1987. In addition, prospective trends in several of the important indicators point to continued declines or slower growth in the months ahead. Most important for many products is the likely continued downturn in housing construction.

International Markets

The United States is the world's leading importer of timber products — chiefly softwood lumber, wood pulp, and paper and board from Canada, and veneer and plywood from southeast Asia. The total value of these imports in 1987 was \$15.3 billion, about 3.8 percent of the value of all U.S. imports. In terms of roundwood equivalents (i.e., the estimated amount of wood required to produce the individual products), more than a fifth of our apparent consumption of timber products in recent years has been imported.

The United States is also a major timber products exporter, the value of which is second only to Canadian shipments in wood markets. In 1987, the value of our timber products exports was \$9.9 billion — about 4.1 percent of our export total. Although we ship a wide variety of timber products to many different 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 lumber, plywood, wood pulp, and paper and board. In recent years China has also become an important market for softwood logs.

Demand in most of our major offshore markets has been strong in 1988. According to data presented at the October meeting of the Timber Committee of the Economic Commission for Europe, economic growth in most of our major European markets has been much stronger in 1988 than in 1987, with lower than forecast interest rates and relatively good construction and manufacturing marketing in most countries. As a result, some expected record levels of softwood lumber

and particleboard consumption for the year. Exports of logs to Japan and China and of lumber to Japan have also been ahead of shipments last year.

Looking forward to 1989, the likelihood is for some slowing in the exports of most products. Our major western European trading partners expect an easing back in their purchases as a result of probable rising interest rates and slightly slower overall growth. Industry analysts also expect that shipments to our major Pacific Rim markets also will be smaller than they were this year. Imports, in general, probably will be constrained by lower demand as outlined earlier.

Timber Products Consumption, Trade, and Production

Softwood Lumber

Softwood lumber consumption for all of 1988 (based on data from the U.S. Bureau of the Census) is estimated at 45.9 billion board feet, 7.6 percent below the record 49.7 billion board feet consumed in 1987.

Total imports for 1988 are expected to drop to 13.8 billion board feet, down about 6.3 percent from the volume imported in 1987. Exports for the year are likely to total about 3.1 billion board feet. This would be about 26 percent more than in 1987 and a record level.

With somewhat slower markets, production for all of 1988 should amount to about 35.2 billion board feet, almost 6 percent below production in 1987. Present expectations about housing and other important markets discussed earlier indicate that further declines in production, imports, exports, and consumption are likely in 1989.

With the prospective slowdown in consumption in 1989, prices likely will not rise markedly in the near future.

Hardwood Lumber

Consumption, based on Bureau of the Census data, is likely to drop to 6.9 billion board feet, about 4.5 percent below the 1987 total. The total hardwood lumber imports for 1987 is estimated at 0.4 billion board feet. The total for hardwood lumber exports for the year is expected to be 1.3 billion board feet, about 70 percent above the volume exported in 1987.

Hardwood lumber production in 1988, based on data from the Bureau of the Census and the above estimates of consumption and trade, is projected at 7.8 billion board feet, up 4 percent from output in 1987. Anticipated slower growth in the important hardwood markets suggests that a decline in production and consumption is likely in 1989. Imports and exports are also expected to show small drops. Hardwood lumber prices have also declined somewhat since earlier in the year.

Softwood Plywood

Softwood plywood consumption has been somewhat weaker than in 1987. Total consumption in 1988 is expected to drop to about 19.7 billion square feet ($\frac{3}{8}$ -inch basis), about 3.4 percent less than was used in 1987. The total softwood plywood exports for 1988 is expected to be about 1 billion square feet. Imports are expected to amount to about 0.1 billion board feet. With these levels of consumption and trade, softwood plywood production for 1988 is projected to decline to 20.6 billion square feet ($\frac{3}{8}$ -inch basis), about 2.4 percent below output in 1987.

For 1988, with the prospective drop in new housing construction and the slower growth in other markets, total consumption is expected to decline about 2 percent to 19.3 billion square feet, and production should total 20.1 billion square feet, 2.4 percent below output for this year. If demand declines in 1989 as outlined above, a sustained rise in prices is not likely.

Hardwood Plywood

Consumption of hardwood plywood in 1988 is expected to be near 2.4 billion square feet ($\frac{3}{8}$ -inch basis), about 14 percent below total use in 1987. Imports are likely to drop about 16 percent to 1.6 billion square feet and exports are expected to remain relatively small at about 0.1 billion. With these trends in consumption and trade, production for 1988 will total 0.9 billion square feet, about the same volume as in 1987.

Much of the hardwood plywood consumed each year is used in residential construction as well as in the manufacturing sector. As a consequence, a decline in consumption, imports, and a small drop in production is likely in 1989. Exports are expected to remain close to 0.1 billion square feet.

Particleboard and Medium Density Fiberboard

The National Particleboard Association suggests that combined consumption of particleboard and medium density fiberboard in 1988 is close to 5.2 billion square feet (¾-inch basis), about 2 percent above that used in 1987. With these estimates, production would amount to 4.7 billion square feet, about the same as production in 1987. Trends in major markets suggest that a decline in production, consumption, imports, and exports is likely in 1988.

Hardboard and Insulation Board

Hardboard consumption in 1988 is estimated at about 1.7 million short tons, 10 percent below estimated consumption in 1987. With the prospective trends in housing and the major manufacturing markets, consumption and production of hardboard and insulation board are likely to show small declines in 1989. Imports and exports for both products will probably remain about the same as in 1988.

Pulpwood

Pulpwood consumption (roundwood and chips) in 1988 reached a total of 96.7 million cords, up about 1.6 percent from the previous high recorded in 1987. Pulpwood production in 1988 rose to about 98.6 million cords, 2 percent more than in 1987, and also a new record. The prospective increase in overall economic activity suggests that the upward trend will continue in 1989, though at a somewhat slower pace than in the past few years.

Softwood Log Trade

Softwood log exports were up to nearly all destinations; however, shipments to China were more than double the year-earlier volume. Exports for all of 1988 have been estimated at 4.4 billion board feet, 11 percent above shipments in 1987. Industry sources indicate that the outlook for 1989 is for a decline to about 4.0 billion board feet. Softwood log imports are expected to reach 0.1 billion board feet, about a third more than in 1987.

Hardwood Log Trade

Hardwood log exports for 1988 are estimated at 0.2 billion board feet. Although the volume is relatively small, most of the logs exported in 1988 and in recent years have been high quality oak, walnut, and other preferred species that are in short supply in the United States. Thus, these exports have been an important contributing factor to the large increases in stumpage prices for some species. Hardwood log imports in 1988 are expected to be close to 10 million board feet, a little below the volume imported in 1987.

Industrial Roundwood Summary

Given the trends in consumption, trade, and production in 1988, total consumption of all industrial roundwood products (i.e., all roundwood products except fuelwood) is expected to be about 3.8 percent below the record volume consumed in 1987. Production and imports will also be below year-earlier levels. Exports, however, will show a moderately large rise. Consumption, imports, exports, and production will all decline in 1989 if the major markets follow the trends that are forecast.

Fuelwood

Based on available data, fuelwood consumption in 1988 is estimated to be about 48.8 million cords, just slightly less than estimated consumption in 1987. Some additional decline is likely in 1989 if the prices of other fuels do not rise.

1989 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 depending on quantity, quality, access, and market conditions. More specific prices can be obtained by contacting the County Forester, Consulting Foresters, or industry representatives.

Belknap County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Sawlogs	\$60-125	\$110-180	\$140-210
Red Pine	Sawlogs	25-40	75-100	100-140
Hemlock	Sawlogs	25-40	70-85	90-110
Red Oak	Sawlogs	225-350	300-425	340-480 +
White Birch	Sawlogs	65-80	125-150	160-200
Sugar Maple	Sawlogs	50-85	105-140	145-190
Beech	Sawlogs	25-50	90-125	115-160
White Ash	Sawlogs	125-200	190-275	275-310
Pallet (Mixed Hardwood)	Sawlogs	20-40	70-90	100-140
Firewood (Hardwood)	per cord	\$7.00-\$11.00	30-40	50
Hardwood pulp	per cord	\$4.00-\$8.00		50
Softwood pulp	per cord	\$5.00		35
Hemlock pulp	per cord	\$15.00		
Biomass	per ton	\$0.00-\$1.00		16

Carroll County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$60	\$90-120	\$120-150
	Medium	70-100	120-150	150-190
	High	100-150	150-190	190-230
Red Pine	Medium	20-35	80-100	100-120
	High	35-50	100-130	110-150
Hemlock	Medium	20-35	65-80	90-110
	High	35-50	80-100	110-120
Spruce	Medium	30-60	85-100	110-150
	High	60-75	100-120	120-150
Ash	Low	40-70	90-150	135-200
	Medium	70-150	210-300	250-400
	High	140-230	300-400	400-500
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	70-90	90-180
Sugar Maple	Low	25	60	90-130
	Medium	40	90	130-150
	High	70-100	110-175	175-300

Carroll County (Continued)

Species	Quality	Stumpage	Roadside	Delivered
Paper Birch	Low	\$60	\$80	\$110-140
	Medium	75	120	140-170
	High	90-100	165	170-200
Paper Birch Boltwood	Medium	30/cord	40-50/cord	70-100/cord
Yellow Birch	Medium	60-80	70-80	120-160
	High	80-100	140-190	160-225
Oak	Low	30-100	60-120	90-150
	Medium	100-250	120-350	150-400
	High	250-500	250-400	400-700
Mixed Hardwood	Pallet	25-45	70-95	110-120
Hardwood Pulp	per cord	6-10	30-35	47-50
Softwood Pulp	per cord	3-7	19-36	45-52
Fuelwood Chips		0-1.00/ton		

Cheshire County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Sawlog	\$50-90	\$110-150	\$110-175
Red Pine	Sawlog	30-45	85-100	100-150
Hemlock	Sawlog	30-45	65-95	95-130
Spruce	Sawlog	35-45	67-85	90-115
Beech	Sawlog	30-45	50-85	90-125
Poplar	Sawlog	30-45	65-85	90-110
Red Maple	Sawlog	30-45	60-90	90-135
Red Oak	Low	150-200	210-260	200-275
	Medium	200-250	260-300	275-375
	High	250-300 +	325-450	375-650 +
Sugar Maple	Sawlog	60-100	90-160	130-200 +
White Ash	Sawlog	100-250 +	175-300 +	200-400 +
White Oak	Sawlog	100-150	125-200	150-300 +
White Birch	Sawlog	45-70	90-130	125-160
	Boltwood	20-30/cord	40-60/cord	60-80/cord
Yellow & Black Birch	Sawlog	50-100	100-160	120-220
	Boltwood	20-30/cord	40-60/cord	60-80/cord
Mixed Hardwood	Pallet	25-40	55-80	90-120
	Tie Log	30-45	60-95	95-130

Coos County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Sawlog	\$60-95	\$110-145	\$165-220
Spruce-Fir	Sawlog & Cabin	55-75	110-145	180-210
Hemlock	Sawlog	20-35	70-90	120-140
Hard Maple	Sawlog	60-90	115-185	150-225
Soft (Red) Maple (Tie Logs)	Sawlog	20-35	60-95	120-140
Poplar	Sawlog	20-35	70-95	120-140
White Birch	Sawlog	60-80	110-170	200-220
	Boltwood	30-40/cord	65-85	105-115
Beech (Tie Logs)	Sawlog	20-35	70-95	120-140
Yellow Birch	Sawlog	55-120	125-200	150-270
	Boltwood	20-30/cord	50-70	100-160
White Ash	Sawlog	70-130 +	125-200	150-350 +
Basswood	Sawlog	30-50	85-110	120-160
Mixed Hardwood (Pallet & Tie Stock)	Sawlogs	20-35	70-105	120-140
Poplar-Veneer				175

Grafton County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Medium	\$60-90	\$100-150	\$125-200
	High	90-110	140-185	275-400
Hemlock	Sawlog	20-35	70-90	120-130
Spruce-Fir	Sawlog	40-60	100-135	150-200
Yellow Birch	Sawlog	65-90	140-175	160-300
Sugar Maple	Sawlog	65-90	130-175	160-370
White Birch	Sawlog	60-90	125-160	140-275
Red Maple	Sawlog	20-35	90-120	120-180
White Ash	Sawlog	110-200	180-280	180-550
Beech	Sawlog	20-25	75-85	90-120
Red Oak	Medium	130-200	190-250 +	200-325
	High	165-350	240-425	425-750
Red Pine	Sawlog	30-50	85-100	120-140
Poplar	Sawlog	20-35	70-95	120-180
Pallet Mxd. & Tie Logs	Sawlog	20-25	70-100	100-140

Hillsborough County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$55-65	\$80-90	\$120-130
	Medium	70-80	100-110	130-150
	High	85-100	115-130	160-185
Hemlock	Low	30-35	70-75	90-110
	High	40-45	85-90	100-110
Red Oak and W. Ash	Low	85-100	90-100	175-230
	Medium	125-175	140-160	250-300
	High	200-350	200-250	350-500
	Veneer			600-850
Other Hardwoods				
Birch, Maple	Low	40-50	70-90	100-130
Mixed Hardwood	High	85-100	150-200	200-300
Pallet Stock	Logs	30-40	—	90-130

Merrimack County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$50-65	\$80-100	\$90-120
	Medium	70-90	100-110	120-140
	High	70-140	140-160	165-200
Hemlock	All	25-45	70-90	90-125
White Birch	Medium	40-50	90-100	110-160
	High	60-100	120-140	200 +
Hard Maple	Medium	40-60	100-110	130-140
	High	60-200	110-140	175-300
White Ash	Medium	100-300	140-160	200-265
	High	175-300	200-240	350-500
Red Oak	Medium	200-325	225-250	250-400
	High	300-450	275-375	400-800
Pallet Stock	Logs	25-40	75-85	95-130
Pulp Logs—mixed hardwood				\$14-16/ton
Hemlock Logs—pulp				\$16-18/ton
Spruce Pulp				\$18-29/ton

Rockingham County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$60	\$110	\$110-120
	Medium	80	120	130-140
	High	110 +	140 +	150-180
Hemlock	Low	No market		
	High	50	85	100-120
Red & White Oak	Medium	120-150	160-185	200 +
	High	275	310-350	400-525
Pallet	Log	20-40	—	95-120

Strafford County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low to Medium	\$60-90	\$120-150	\$145-185
	High	100-140	160-200	185-235
Hemlock	Low to Medium	25-40	60-75	85-110
	High	40-45	75-85	100-120
Red Oak	Low to Medium	100-200	175-275	200-310
	High	200-400	275-475	375-575
Other Hardwoods	Low to Medium	40-70	90-120	115-155
	High	100-125	150-175	205-230
Birch—Yellow, White, Black	High	100-150	150-200	200-350
White Ash	High	100-150	150-200	200-350

Sullivan County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$60-65	\$110-120	\$140-150
	Medium	80-85	130-140	160-170
	High	90-110	140-160	170-190
Hemlock	Medium	30-35	75-85	105-115
	High	35-50	85-100	115-130
Spruce	Medium	30-40	75-90	105-120
	High	50-60	100-110	130-140
Yellow Birch and Black Birch White Birch } Sugar Maple	Medium	35-60	110-135	125-165
	High	40-75	115-150	145-180
	Medium	65-75	120-150	150-180
Red Oak	High	75-100	150-180	180-210
	Medium	225-250	300-325	300-355
White Ash	High	275-300	350-520	350-550
	Medium	150-180	220-255	250-285
Red Maple	High	200-220	275-370	305-400
Red Maple	All	35-60	90-120	120-150
Pallet		25-40	70-100	100-130
Other Hardwoods		35-50	95-110	125-140

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

Species	Stumpage	Roadside	Mill Yard
Spruce and Fir	\$9.00-13.00	\$22.00-40.00	\$47.00-54.00
Hemlock	3.00-5.00	24.00-30.00	40.00-43.00
Tamarack, Red Pine } White Pine }	3.00-5.00	24.00-30.00	40.00-43.00
Hardwood	6.00-9.00	20.00-30.00	48.00-54.00
Fuelwood (residential)	4.00-8.00		
Mixed Random Length			15.00/ton

*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 Hampshire²

Species	Stumpage		Delivered
Softwood Pulp Random Length			
Pine	\$2.00-5.00	\$15.26-22.00/ton or	\$33.57-47.30/cord
Hemlock	3.00-8.00	16.50-21.00/ton or	37.88-53.55/cord
Spruce and Fir	3.00-10.00	17.54-26.00/ton or	38.53-54.59/cord
Hardwood Pulp Random Length			
Mixed Hardwood	6.00-10.00	18.68-19.59/ton	47.63
Poplar	4.00-8.00		

Prices of Pulpwood Per Cord—Southern New Hampshire²

Species	Stumpage	Roadside	Delivered at Mill
Softwood Pulp	\$0.75-1.50/ton 2.25-4.00/cord	\$12.00-26.00/ton 20.00-55.00/cord	\$15.00-31.00/ton 40.00-50.00/cord
Random Length Softwood	3.00-5.00	20.00-30.00	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 ¹ (mixed)	\$8.00
Hardwood (mixed)	8.00

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

²Contact buyers for exact prices and mileage allowances.

Price of Pulp Chips^{1,2} (Paid in New Hampshire)

	Produced from Slabs and Edgings (Clean, Screened, Bark free)	
	F.O.B. Sawmill Per Green Ton	Delivered to Pulp Mill Per Green Ton
Pine and Hemlock	\$12.00-18.00	\$22.80-28.05
Spruce and Fir	12.00-19.00	26.80-31.05
Hardwood (mixed)	10.50-14.00	20.65-26.15

¹Chips are bought by weight or by volume.

²Contact buyers for exact prices and mileage allowances.

Average Price of Total Tree and Fuel Chips

	Spout Prices (including stumpage)	Delivered	Stumpage
Pulp quality: Hardwood	\$16.00-21.00/ton	\$20.00-25.00/ton	\$0.50-2.30/ton
Softwood	12.00-17.00/ton		0.50-2.00/ton
Fuel quality: Mixed Species	\$12.00-16.00/ton	\$16.00-20.25/ton	0.65-20.00/ton
Biomass		New England markets	
Sawdust		\$9.00-13.00/ton	Tops for Biomass
Sawdust and Bark Combination		9.00-15.00/ton	\$0.50/ton
Bark Fuel (Processed)		14.00/ton	

Table IV. Price Range Boltwood, Posts, Poles, Piling, Cross Ties, and Switch Ties

Species	Stumpage	Roadside	Delivered at Mill
	Boltwood Per Cord ¹		
White Birch	\$30.00-40.00	\$65.00-85.00	\$105.00-115.00 per cord
Beech	20.00-25.00	40.00-45.00	85.00-100.00 per cord
Sugar Maple and Ash	25.00-30.00		85.00-105.00 per cord
Yellow Birch	25.00-30.00	50.00-70.00	85.00-105.00 per cord

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

Guardrail Posts, Utility Poles and Piling

Species	Min. Small End Diameter	Max. Large End Diameter	Length	Delivered
Posts				
Red Pine				
Pitch Pine	5"	10"	7' or Multiples	\$1.75 ea.
White Pine				
Spruce				
Poles and Piling				
Red Pine	7"	17"	40'	\$0.80/lin. ft.
Pitch Pine				

Railroad Crossties

Grade	Size	Oak Ties F.O.B. Mill		Mixed Hardwood Ties ¹ F.O.B. Mill	
		Each	Per MBF	Each	Per MBF
3	(6" × 8" × 8'6")	\$ 8.65	\$254.00	\$ 8.15	\$240.00
4	(7" × 8" × 8'6")	11.50	290.00	10.50	265.00
5	(7" × 9" × 8'6")	12.50	280.00	11.50	258.00

¹Beech, Birch, Maple, Cherry, Ash, Hickory

Switch Ties (Oak only)

(7" × 9")	12'-16' long	\$330.00-375.00 per MBF +
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Table V. Price Range of Hardwood Fuelwood Per Cord

Species	Stumpage	Roadside	Delivered Buyers Premises
Hardwood	} \$8.00-15.00	\$35.00-60.00	\$60.00-100.00 +
4' Wood		60.00-80.00	90.00-130.00
12", 14", 16" Lengths		15.00-40.00	25.00-55.00
Slabs (Hardwood or Softwood)			120.00-150.00
Dry fuelwood, 16 inches			
Tree length loads of cordwood			
Southern N.H.	8.00-15.00	40.00-55.00	55.00-60.00
Northern N.H.	6.00-10.00	25.00-40.00	50.00-60.00

Table VI. Price Range of Sawdust and Shavings and Bark

	Per-Cord Green at Sawmill	Per Bag—Dry
Sawdust	\$10.00-18.00 or 7.50-18.00 per ton	
Shavings	10.00-20.00	\$2.00-2.50
Bagged Dry Shavings		2.00-2.50
Bark	6.00-12.00 per yard (loaded) or 12.00-15.00 per ton	27.00 per ton (processed)

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

Sawlogs: Felling and Limbing	\$15-20 per MBF
Yarding and Bucking (softwood)	35-45 per MBF
(hardwood)	35-50 per MBF
Felling, Yarding and Bucking (softwood)	55-65 per MBF
(hardwood)	50-75 per MBF
Pulpwood and Cordwood: (with machine) stump to roadside	
Random length	17-25 per cord
Biomass	5-8 per ton
Contract Chipping—roadside	4.00-5.00 per ton

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

Sawlogs: Felling and Limbing	\$15 per MBF
Yarding and Bucking (softwood)	35-40 per MBF
(hardwood)	35-45 per MBF
Felling, Yarding and Bucking (softwood)	50-70 per MBF
(hardwood)	60-100 per MBF
Pulpwood and Cordwood: (with machine) stump to roadside	
Random length	25-35 per cord
4' length	35 per cord

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

Custom Sawing—	
Softwood	\$120.00-150.00 per MBF or 120.00-175.00 per hour
Hardwood	150.00-225.00 per MBF or 120.00-175.00 per hour
Planing	50.00-70.00 per MBF, 2 sides; 50.00 per MBF 4 sides; patterns extra.
Resawing	40.00-50.00 per MBF

Table VIID. Representative Kiln Drying Costs (Custom)

4/4 Pine (Yard)	12-14% MC	\$75.00-85.00
4/4 Pine-Furniture	6-8% MC	90.00-100.00
4/4 Oak-Furniture	6-8% MC	140.00-160.00
4/4 Maple-Furniture	6-8% MC	90.00-100.00
8/4 Oak	6-8% MC	375.00-390.00

Table VIII. Representative Trucking Costs* (Trucks with Loaders)

Sawlogs: Local deliveries	\$20.00-40.00 per MBF
Distant deliveries	20.00-30.00 for the first 10 miles and 40¢ to 50¢ for each additional mile. OR 40.00 to 50.00 per hour
Cordwood and Pulpwood:	20.00-25.00/cord.
Lumber and Chips:	1.75-2.00 per loaded mile.

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

CHRISTMAS TREE SITUATION — 1989

Increased numbers of New Hampshire trees from first rotation plantations continue to find their way to the marketplace. The majority of these trees are sold on a cut-your-own basis, with the remainder being wholesaled. Most of the new trees in the marketplace are from smaller plantations of less than five acres in size.

Large scale New Hampshire producers wholesale trees throughout the northeast and seem to have strong markets for a quality product.

Initial retail market survey information for southern New Hampshire and northern Massachusetts shows that only 8% of the trees were from New Hampshire and 13% from the other New England states, with the majority of trees being imported from Canada. While most retailers are very satisfied with their current arrangements 98% indicated they might be interested in purchasing New Hampshire trees.

While there are good prospects for displacement of imported trees, there is a need to expand markets lost to the artificial tree and perhaps unduly restrictive fire ordinances.

Balsam fir, white spruce, and to a lesser degree scotch pine, are the staple of the industry with fraser fir, douglas fir, blue spruce and white pine rounding out the market.

Surplus trees at the retail marketplace in 1988 will probably affect wholesale ordering for the 1989 season. Prices are expected to stabilize with little or no increase for 1989 despite rising management cost.

Overall, prospects for the New Hampshire Christmas tree industry are good and should remain that way as long as growers can respond to needed changes in marketing and management.

Table VIII. Wholesale Price Range of Christmas Trees and Boughs

	Roadside 6-7' Trees	
	Grade 1 ^(a)	Grade 2 ^(b)
Balsam Fir ^(b)	\$14.00-19.00	\$10.00-13.00
White Spruce	12.00-14.00	8.00-10.00
Scotch Pine	12.00-18.00	8.00-10.00
Blue Spruce	15.00-20.00	
White Pine	10.00-15.00	
Fraser Fir	15.00-18.00	
BOUGHS (baled or tied)		
Balsam Fir 50 lb. bundle	\$6.50-9.00	\$225-350/ton
Pine 50 lb. bundle	5.00-7.00	200-280/ton
Wreaths—Size 12" to 14"	(Ring Size)	
Balsam Fir—single faced	\$2.75-3.50 ea	
double faced	3.50-5.00 ea	

^(a) No uniform grading system is in use statewide. Grades based on foliage density and symmetry.

^(b) Consult county forester for local market information for pasture run balsam fir Christmas trees.

Table IX. Retail Price Range of Single Christmas Trees

	(Select and cut your own)
White Pine	
Scotch Pine	
Balsam Fir	
White Spruce	\$12.00-30.00 or \$2.00-3.00 per lineal foot
Douglas Fir	
Norway Spruce	
Blue Spruce	
Fraser Fir	

MAPLE PRODUCTS SITUATION – 1989

Expansion of the industry and an overstock of inventory in Canada should lower prices at packing plants and maintain level prices at the retail level during 1989. If the 1989 production is high, prices could soften during the year and in 1990.

Bulk syrup prices ranged from \$.85/lb. for non-table grades to \$2.40/lb. for light amber.

Producers must constantly be striving for more efficiency in production coupled with innovative marketing approaches to obtain a satisfactory profit margin.

Planning for profit should be an integrated effort including:

1. Reduce cost by improving production and packaging methods.
2. Plan sales throughout the year; prices tend up toward the end of the year.
3. Consider new packaging including novelty containers, etc.
4. Consider processing into maple products or maple flavored products.
5. Develop new channels of distribution from on farm retail sales to bulk sales and from grocery store to supermarkets and restaurant chains.
6. Use a pricing schedule that covers all costs and leaves a margin for profit.

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

% Sugar	¢ / gal.	% sugar	¢ / gal.
0-1.1	1.1	3.4	38.8
1.2	4.4	3.5	40.2
1.3	6.6	3.6	41.6
1.4	8.7	3.7	43.0
1.5	10.7	3.8	44.4
1.6	12.6	3.9	45.8
1.7	14.4	4.0	47.2
1.8	16.1	4.1	48.6
1.9	17.7	4.2	50.0
2.0	19.2	4.3	51.4
2.1	20.6	4.4	52.8
2.2	22.0	4.5	54.2
2.3	23.4	4.6	55.6
2.4	24.8	4.7	57.0
2.5	26.2	4.8	58.4
2.6	27.6	4.9	59.8
2.7	29.0	5.0	61.2
2.8	30.4	5.1	62.6
2.9	31.8	5.2	64.0
3.0	33.2	5.3	65.4
3.1	34.6	5.4	66.8
3.2	36.0	5.5	68.2
3.3	37.4		

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

<u>Maple Syrup</u> Retail at Farm		<u>Maple Syrup</u> Retail at Store	<u>Maple Products</u> Retail		
1 gallon	\$30.00-36.00	\$38.00-45.00	Sugar	1 lb.	\$8.50-9.50
½ gallon	19.00-22.00	24.00-28.00	Cream	½ lb.	4.50-5.50
1 quart	9.50-12.50	13.00-15.00	Candy	¼ lb.	4.50-7.00
1 pint	6.00-7.50	7.00-9.00			
½ pint	3.25-4.00	4.00-5.00			

Rent Price Per Tap Hole

Tap hole rentals: 20-30 cents per tap with average being 25 cents. Sugar Maples in the woods and not too easy to get to average 20 cents per tap; while easily accessible trees and roadside trees average 30 cents per tap.

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 FOREST 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, $\frac{1}{4}$ " 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 $4\frac{1}{2}$ 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

1/4-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

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

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.	Available Heat, Million BTU ¹	Equivalent in Gallons of Fuel Oil ²
	Green	Air Dry	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

¹50 to 60% efficiency of burning unit.

²70% 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.¹**

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

¹Weights 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 if 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	Minimum Dressed		Nominal	Minimum Dressed					
		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	3	2-1/2	2-9/16					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.
1x1	1/12	4x4	1-1/3
1x2	1/6	4x5	1-2/3
1x3	1/4	4x6	2
1x4	1/3	4x7	2-1/3
1x6	1/2	4x8	2-2/3
1x8	2/3	4x9	3
1x10	5/6	4x10	3-1/3
1x12	1	4x12	4
2x2	1/3	5x5	2-1/12
2x3	1/2	6x6	3
2x4	2/3	7x7	4-1/12
2x5	5/6	8x8	5-1/3
2x6	1	9x9	6-3/4
2x7	1-1/6	10x10	8-1/3
2x8	1-1/3	11x11	10-1/12
2x9	1-1/2	12x12	12
2x10	1-2/3	14x14	16-1/3
2x11	1-5/6	15x15	18-3/4
2x12	2	16x16	21-1/3
2x13	2-1/6	17x17	24-1/12
2x14	2-1/3	18x18	27
2x15	2-1/2	19x19	30
2x16	2-2/3	20x20	33-1/3
3x3	3/4	22x22	40-1/3
3x4	1	22x24	44
3x5	1-1/4	24x24	48
3x6	1-1/2	26x26	56-1/3
3x7	1-3/4	28x28	65-1/3
3x8	2	30x30	75
3x9	2-1/4	32x32	85-1/3
3x10	2-1/2	34x34	96-1/3
3x11	2-3/4	36x36	108
3x12	3		