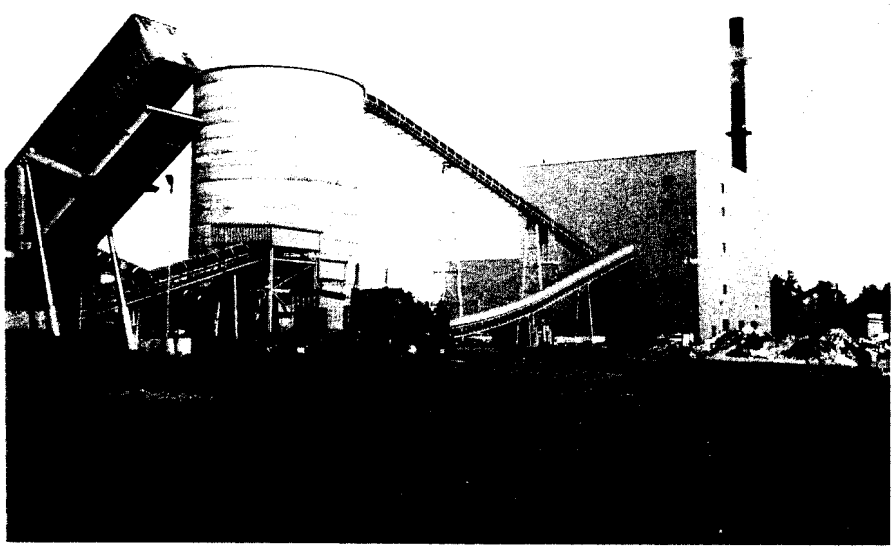
Extension Publication 11 April 1988

NEW HAMPSHIRE FOREST MARKET REPORT 1988



Biomass Energy

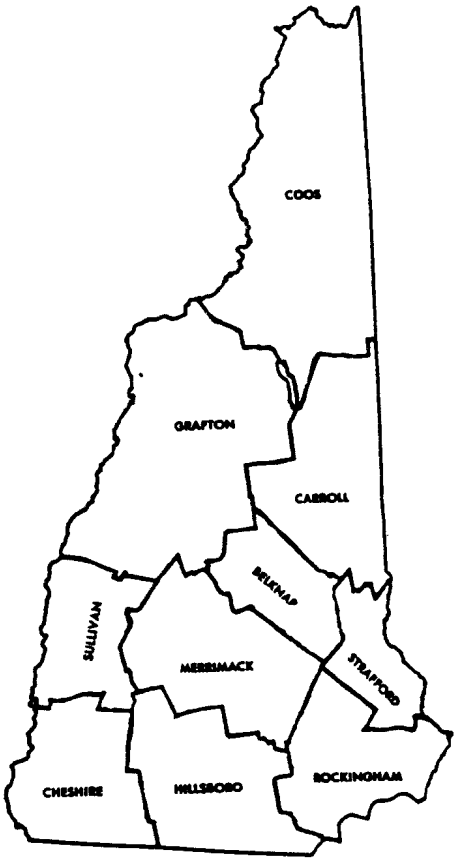
COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF NEW HAMPSHIRE

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
David J. Paganelli
Box 191, Woodsville, N.H. 03785
787-6944

Robert L. Edmonds, Program Leader
Pettee Hall, University of New Hampshire
Durham, N.H. 03824 862-1029 or 862-1056

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
RFD #7, Box 9
Penacook, 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

Robert L. Edmonds
Extension Specialist, Harvesting and Sawmilling
862-1056 or 862-1067

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

Charles A. Bridges
Extension Specialist, Wildlife Management
862-1028 or 862-1066

MARKET SITUATION 1987

OUTLOOK—1988

Most economists and other market analysts feel that the overall situation and outlook has changed since the stock market crash in October. In general, they feel that the consequences of the downturn will be negative; but, as usual there is some difference of opinion as to the extent and length of its effects.

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, rose to $3,815 billion, up 2.7 percent from 1986. First quarter growth at an annual rate of about 1.5 percent followed by slow improvement over the last three quarters could push the average for 1988 to about $3,890 billion.

Major Timber Product Market Trends

New housing units starts, which in the past have accounted for more than a third of U.S. annual consumption of softwood lumber and plywood and for substantial volumes of other softwood and hardwood products when compared with 1986, have been below year-earlier volumes. The falloff in single-family units is generally attributed to increases in interest rates and total 1.63 million, about 10 percent below 1986. The most recent consensus estimates for 1988 show a further decline of about 8 percent to 1.53 million units.

Repair and remodeling of residential structures, another major wood products market, apparently has been growing rapidly in 1987. Many industry observers feel that both repair and remodeling expenditures have been rising more rapidly than indicated by the available statistics, primarily because much of the work is of the do-it-yourself type. As for next year, most analysts expect a somewhat lower rate of expenditures, particularly in the first half of 1988.

Nonresidential construction activity in 1987 has been relatively weaker than during 1986. A number of factors, including lack of investment incentives under the new tax laws and past overbuilding of office and hotel and motel space in some major markets, apparently have contributed to the lack of growth for the year and little growth can be expected late in the last part of 1988.

The index of manufacturing production—an important indicator of the demand for pallet lumber, container board, and some grades of paper—rose in 1987.

Although the indexes for the major wood using manufacturing industries have shown an upward trend during 1987, growth was slow and most analysts saw only small additional increases in output in the last quarter of 1987 and in 1988. The extent of any prospective declines will depend, in large part, on consumer confidence and expenditures as discussed before.

In summation, markets for the major timber products showed somewhat mixed trends over 1987. Current economic conditions and prospective trends in some of the important indicators pointed to lower levels of demand in the last months of 1987 and in 1988. Most important for the major softwood products were the prospective declines in housing and other construction. The outlook for hardwoods was most affected by the trends in the manufacture and shipment of consumer and other goods.

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 United States is also a major timber products exporter. In 1986, the value of our timber product exports was $7.7 billion—about 3.7 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. Overall, the outlook for U.S. exports of timber products was for a relatively large rise for many in 1987 with continued but smaller increases in 1988. Imports, in general, likely will be constrained by lower demand and continued unfavorable exchange rates.

Timber Products Consumption, Trade, and Production

Softwood Lumber

Consumption for all of 1987 was estimated at about 48.0 billion board feet. This would be a record volume, about 3 percent above the old record 46.6 billion board feet consumed in 1986. Imports of softwood lumber, nearly all from Canada, slowed somewhat over 1987. Total imports for 1987 were expected to be down less than 1.0 percent to 14.2 billion board feet.

Exports in 1987 were up 26 percent from 1986 to a total of 2.4 billion board feet, due to somewhat improved offshore markets and the U.S. dollar decline relative to other currencies. Production for all of 1987 should have amounted to about 36.2 billion board feet, 5.8 percent more than was produced in 1986. The price of domestically produced softwood lumber, though fluctuating somewhat, rose in 1987.

Hardwood Lumber

Consumption, based on Bureau of the Census data, reached 7.3 billion board feet, about 1.5 percent above the 1986 total. The total hardwood lumber imports for the year amounted to 0.7 billion board feet, about 150 million board feet above the volume exported in 1986. Production of hardwood lumber in 1987 is estimated to have reached 7.6 billion board feet, about 2.7 percent above production in 1986. Anticipated slowing in the important hardwood lumber markets in 1988 suggests that a drop in production and consumption is likely in 1988. Imports are also expected to decline, but exports should continue to rise.

Softwood Plywood

Total consumption in 1987 rose to 20.4 billion square feet (3/8-inch basis), about 4.6 percent more than was used in 1986. Data for 1987 show significantly larger shipments to nearly all of our major offshore markets. Total exports for 1987 rose to 0.8 billion square feet. Imports were down to a total of about 0.1 billion board feet for the year. With these levels of consumption and trade, production for the year increased to 21.1 billion square feet, up about 6 percent from total output in 1986.

For 1988, with the prospective drop in use of new housing construction and slow growth in other markets, total consumption is expected to drop about 7 percent to 19.0 billion square feet. Imports are likely to remain at about 0.1 billion square feet and exports to increase to 0.9 billion. As a consequence, production should total 19.8 billion square feet, about 6.2 percent below the estimate for 1987. Softwood plywood prices have fluctuated somewhat, but overall have been relatively flat since the late 1970's.

Hardwood Plywood

Consumption of hardwood plywood in 1987 was near 2.7 billion square feet (3/8-inch basis), about the same volume as in 1986. Production for 1987 totaled 0.8 billion square feet, the same volume as in 1986. In 1988 exports are expected to remain close to 0.1 billion square feet. Hardwood plywood prices, as indicated by the producer price index, have changed very little over the past year.

Particledboard and Medium Density Fiberboard

Activity in the major markets and shipments data from the National Particleboard Association indicate that combined consumption of these two products is likely to total close to 5.1 billion square feet (3/4-inch basis), about 4 percent above total use in 1986. Production amounted to 4.8 billion square feet, 6.7 percent above production in 1986. Trends in the major markets discussed earlier, suggest that consumption, imports, and production will decline in 1988. Exports are likely to remain near 0.2 billion square feet.

Hardboard and Insulation Board

Hardboard consumption in 1987 was estimated at 2.0 million tons, about 7 percent below total use in 1986. Imports and exports are expected to remain close to 0.3 and 0.1 million tons, respectively. With these levels of consumption and trade, production would amount to 1.8 million tons, down 5 percent from output in 1986. Hardwood and insulation board consumption and production are likely to drop in 1988.

Pulpwood

Paper and paperboard production and consumption moved steadily upwards through 1987, with record high annual rates of production according to data from the American Paper Institute. As a consequence, pulpwood consumption was also at a record rate. Based on the trends in the economy pulpwood consumption (roundwood and chips) totaled about 94.7 million cords in 1987, up about 2.8 percent from the record volume consumed in 1986.

Imports of pulpwood, mostly pulpwood chips from Canada, dropped sharply from year-earlier levels through 1987, according to Bureau of the Census data. As a result, imports for the year were expected to total 0.3 million cords. Exports are estimated at 2.1 million cords, about 10 percent above exports in 1986. All of the increase in exports is likely to be in the form of pulpwood chips.

Pulpwood consumption in 1987, given the above estimates of consumption and trade, was expected to reach 96.5 million cords, 3.3 percent more than was produced in 1986. Consumption and production of pulpwood also are expected to increase in 1988, but at a slower pace than over the past 2 years. There probably will be little change in imports and exports.

Softwood Log Trade

Exports for the year to all destinations are estimated to reach about 4.1 billion board feet. Industry sources indicate that the outlook for 1988 is for an additional, though smaller, rise. Imports of softwood logs, nearly all from Canada, declined sharply in 1987 and are expected to total less than 0.1 billion board feet for 1987 and 1988.

Hardwood Log Trade

Hardwood log exports for 1987 were estimated at 0.2 billion board feet, up about 35 percent from 1986. Hardwood log imports in 1987 are expected to be close to 15 million board feet, roughly half the volume imported in 1986. Only about 5 percent of the total volume is expected to be tropical species.

Industrial Roundwood Summary

Given the trends in consumption, trade, and production for the various products in 1987, total consumption of all industrial roundwood products (i.e., all roundwood products except fuelwood) was estimated to be about 2.0 percent above the volume consumed in 1986 and to top 16 billion cubic feet for the first time. Production and exports also will be above year-earlier levels. Imports will show a small decline. Consumption, imports, and production will all decline somewhat in 1988 if the major markets follow the trends discussed earlier. Exports are likely to continue up, though more slowly than in 1987.

Fuelwood

Current estimates indicate that fuelwood consumed for domestic cooking and heating has risen to about 51 million cords. Various surveys of the forest products industries show that there also have been large increases in the use of fuelwood for industrial heat and power generation in the past few years. Most of the growth in use by the forest products industries has come from increased utilization of logging and mill residues and land clearing.

1988 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	$60-115	$90-170	$110-250
Red Pine	Sawlogs	20-35	70-100	95-130
Hemlock	Sawlogs	30-40	80-90	90-115
Red Oak	Sawlogs	80-400	155-450	270-700+
White Birch	Sawlogs	65-80	120-135	140-200
Sugar Maple	Sawlogs	50-85	105-140	130-200
Beech	Sawlogs	25-60	80-110	90-130
White Ash	Sawlogs	80-150	140-200	215-375
Pallet (Mixed Hardwood)	Sawlogs	20-35	70-85	100-130
Firewood (Hardwood)	per cord	$7.00-$10.00	30-45	50-85
Hardwood pulp	per cord	$4.00-$7.00		40-50
Softwood pulp	per cord	$0.00-$3.50		30-40
Biomass	per ton	$0.00-$1.00		10-25

Carroll County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	$40	$80-90	$90-120
	Medium	70-100	90-140	120-185
	High	100-140	140-185	185-230
Red Pine	Medium	20-35	70-85	90-110
	High	35-50	85-95	110-150
Hemlock	Medium	20-35	50-80	90-110
	High	35-60	80-100	110-130
Spruce	Medium	30-60	85-100	110-150
	High	60-75	100-120	120-150
Ash	Medium	40-70	90-150	135-200
	High	70-110	150-230	250-390
Basswood	Medium	25-50	50-80	85-160
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	70-90	110-130	150-220

Carroll County *(Continued)*

Species	Quality	Stumpage	Roadside	Delivered
Paper Birch	Low	$60	$80	$110-140
	Medium	75	120	140-170
	High	90	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	250-600	250-600	400-850
Mixed Hardwood	Pallet	25-45	70-95	110-130

Cheshire County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Sawlog	$60-90	$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	170-200	210-260	260-275
	Medium	200-250	260-300	275-375
	High	300-400	325-450	375-600
Sugar Maple	Sawlog	60-100	90-160	130-200+
White Ash	Sawlog	100-250+	175-300+	200-350+
White Oak	Sawlog	100-150	125-200	150-275+
White Birch	Sawlog	45-70	90-130	125-165
	Boltwood	20-30/cord	40-60/cord	60-80/cord
Yellow & Black Birch	Sawlog	50-100	100-160	120-200
	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	50-75	110-145	165-210
Hemlock	Sawlog	20-35	70-90	120-140
Hard Maple	Sawlog	40-90	115-185	100-250
Cherry	Sawlog	70-100	170-190	220-250
Soft (Red) Maple	Sawlog	20-35	60-95	120-140
Poplar	Sawlog	20-35	70-95	120-140
White Birch	Sawlog	60-90	110-170	220
	Boltwood	30-40/cord	65-85	105-115
Beech	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 +
Red Oak	Sawlog	100-200 +	150-300	250-350 +
Basswood	Sawlog	30-50	85-110	120-160
Mixed Hardwood (Pallet & Tie Stock)	Sawlogs	20-35	70-105	120-140

Grafton County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Sawlog	$65-120	$125-175	$140-300 +
Hemlock	Sawlog	20-30	80-90	90-120
Spruce-Fir	Sawlog	35-60	95-130	110-160
Yellow Birch	Sawlog	65-90	130-165	130-270
Sugar Maple	Sawlog	65-90	130-175	165-350
White Birch	Sawlog	60-90	125-160	150-210
Red Maple	Sawlog	20-35	90-120	110-150
White Ash	Sawlog	110-200	180-280	185-500 +
Beech	Sawlog	20-25	75-85	90-120
Red Oak	Sawlog	165-350 +	240-425 +	250-750 +
Red Pine	Sawlog	30-60	90-110	100-150
Poplar	Sawlog	20-30	75-100	90-120
Pallet Mxd. & Tie Logs	Sawlog	15-25	70-95	90-130

Hillsborough County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	$55-65	$80-90	$110-120
	Medium	65-75	100-110	130-140
	High	80-95	115-130	150-175
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	60-100	110-140	175-200
White Ash	Medium	100-300	140-160	200-265
	High	175-300	200-240	350-500
Red Oak	Medium	300-450	225-250	225-400
	High	225-325	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	$50	$90	$110
	Medium	75	110	130
	High	110	125+	150+
Hemlock	Low	No market		
	High	40	85	95
Red & White Oak	Medium	90	150	180
	High	300+	310+	400+
Pallet	Log	20-40	—	85-110

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

Sullivan County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	$65-80	$105-110	$135-140
	Medium	80-95	115-125	150-155
	High	85-110	125-140	165-180
Hemlock	Medium	30-35	75-80	100-115
	High	40-50	85-95	115-120
Spruce	Medium	30-35	75-80	100-115
	High	40-50	85-95	115-120
Yellow Birch and Black Birch and White Birch	Medium	40-75	120-135	120-160
	High	50-90	125-155	150-180
Sugar Maple	Medium	60-75	130-135	150-175
	High	70-90	150-155	180-210
Red Oak	Medium	175-280	235-375	275-450
	High	250-325	310-400	400-600
White Ash	Medium	125-180	150-200	200-225
	High	150-250	180-340	250-375
Red Maple	All	35-45	80-90	110-130
Pallet		25-30	80-85	105-115
Other Hardwoods		20-40	75-95	260-300

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

Species	Stumpage	Roadside	Mill Yard
Spruce and Fir	$8.00-12.00	$22.00-40.00	$47.00-54.00
Hemlock	3.00-4.00	24.00-30.00	40.00-43.00
Tamarack, Red Pine White Pine	3.00-4.00	24.00-30.00	40.00-43.00
Hardwood	5.00-7.50	20.00-30.00	46.00-49.00
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 Hampshire[2]

Species	Stumpage		Delivered
Softwood Pulp Random Length			
Pine	$2.00-5.00	$15.26-21.00/ton or	$33.57-45.15/cord
Hemlock	2.00-8.00	16.50-21.00/ton or	37.88-53.55/cord
Spruce and Fir	3.00-10.00	17.54-22.43/ton or	38.53-47.10/cord
Hardwood Pulp Random Length			
Mixed Hardwood	6.00-10.00	18.79/ton or	47.91/cord
Poplar	4.00-8.00		

Prices of Pulpwood Per Cord–Southern New Hampshire[2]

Species	Stumpage	Roadside	Delivered at Mill
Softwood Pulp	$0.75-1.50/ton	$12.00-26.00/ton	$17.00-31.00/ton
	2.25-4.00/cord	20.00-55.00/cord	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:	OSB stock		19.00/ton
8′ Long Pulpwood–Poplar–Aspen			22.50/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

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

[1]Chips are bought by weight or by volume.
[2]Contact 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	Depending	$0.50-2.30/ton
Softwood	12.00-17.00/ton	on distance	0.50-2.00/ton
Fuel quality: Mixed Species	$12.00-17.00/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)		13.00/ton	

Table IV. Price Range Boltwood, Posts, Railroad 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

[1]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 White Pine Spruce	5″	10″	7′ or Multiples	$1.75

Railroad Crossties

Grade	Size	Green Mixed Hardwood Ties[1] F.O.B. Mill
		per MBF
3	(6″ × 8″ × 8′6″)	$240 - 250
4	(7″ × 8″ × 8′6″)	240 - 250
5	(7″ × 9″ × 8′6″)	240 - 250

Switch Ties (mixed hardwood)[1]

(7″ × 9″)	9′-12′ long	$240 per MBF +
(7″ × 9″)	13′-16′ long	260 per MBF +

[1]Oak, Beech, Birch, Maple, Cherry, Ash, Hickory

Table V. Price Range of Hardwood Fuelwood Per Cord

Species	Stumpage	Roadside	Delivered Buyers Premises
Hardwood			
4′ Wood	$6.00-12.00	$35.00-60.00	$60.00-100.00+
12″, 14″, 16″ Lengths	$6.00-12.00	60.00-80.00	85.00-130.00
Slabs (Hardwood or Softwood)		15.00-40.00	25.00-55.00
Dry fuelwood, 16 inches			120.00-150.00
Tree length loads of cordwood			
Southern N.H.	6.00-12.00	30.00-45.00	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	$10-15 per MBF
Yarding and Bucking (softwood)	35-40 per MBF
(hardwood)	35-45 per MBF
Felling, Yarding and Bucking (softwood)	45-70 per MBF
(hardwood)	50-100 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	30.00-40.00 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	130.00-150.00
4/4 Maple—Furniture	6-8% MC	90.00-100.00

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

Sawlogs: Local deliveries	$18.00-30.00 per MBF
Distant deliveries	18.00-22.00 for the first 10 miles and 40¢ to 50¢ for each additional mile. OR 35.00 to 50.00 per hour
Cordwood and Pulpwood:	100.00 per load.
Lumber and Chips:	1.75-2.00 per loaded mile.

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

CHRISTMAS TREE SITUATION

A national surplus, intense market penetration from the Canadian provinces and surrounding states, and competition with the artificial tree are factors that are affecting the New Hampshire Christmas tree industry.

Although there were some unsold trees in parts of New England, the wholesale market remains strong for New Hampshire trees with most large scale producers having a good year. Prices are expected to remain stable in 1988.

First-rotation trees from smaller plantations continue to find their way to market. This trend is expected to continue but shouldn't create problems as these New Hampshire trees should be displacing imported trees. Creative marketing will be needed for the increasing numbers of first-rotation trees maturing in the next 5 years.

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

Cut-your-own retail operations are very successful with demand continuing to exceed supply. There is room for expansion in these plantations. Some wholesalers are providing cut-your-own services as part of their marketing mix.

Quality trees with competitive prices are a must in today's marketplace. Prospects for the New Hampshire Christmas tree industry are strong 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]	$13.00-18.00	$9.00-12.00
White Spruce	10.00-12.00	6.00-8.00
Scotch Pine	10.00-14.00	6.00-8.00
Blue Spruce	15.00-20.00	
White Pine	10.00-14.00	
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 Douglas Fir Norway Spruce Blue Spruce Fraser Fir	$12.00-20.00 or $2.00-3.00 per lineal foot

MAPLE PRODUCTS SITUATION 1987–1988

At the end of 1987, very little maple syrup was available due to a poor production season in 1987, and hardly any carry-over inventory from the previous year.

Bulk syrup prices ranged from $1.15/lb. for non-table grades to $2.75/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

Maple Syrup Retail at Farm		Maple Syrup Retail at Store	Maple Products 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	½ 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 realting 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, 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

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'×4'×8' 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

[1]50 to 60% efficiency of burning unit.
[2]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.[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

[1]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 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
	1-1/4	1	1-1/32	8	7-1/4	7-1/2
				9	8-1/4	8-1/2
	1-1/2	1-1/4	1-9/32	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
	2-1/2	2	2-1/16	3	2-1/2	2-9/16
	3	2-1/2	2-9/16	4	3-1/2	3-9/16
	3-1/2	3	3-1/16	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
	4-1/2	4	4-1/16	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		13-1/2
				16		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		