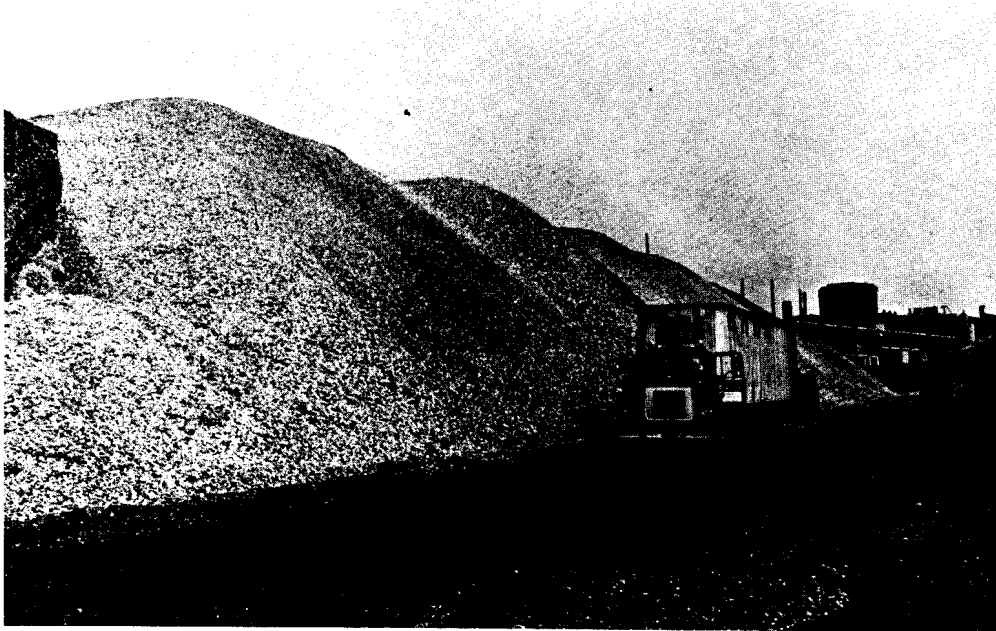


# **NEW HAMPSHIRE FOREST MARKET REPORT 1982**



**We're In The Chips**

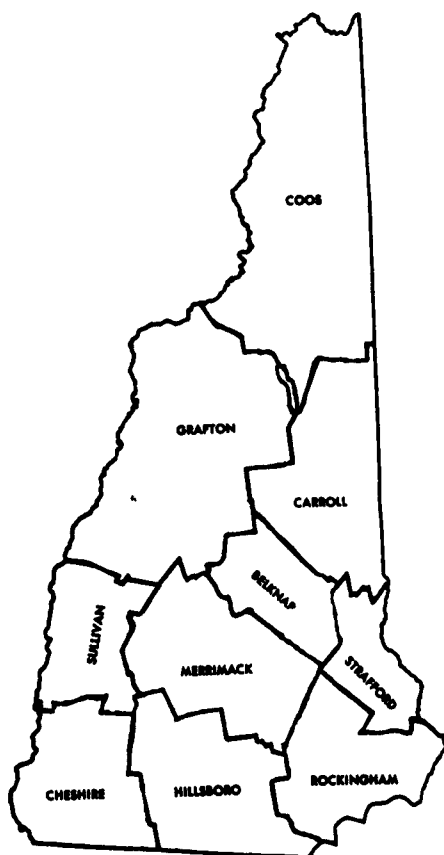
**COOPERATIVE EXTENSION SERVICE  
UNIVERSITY OF NEW HAMPSHIRE**

**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

Roger P. Sloan, *Extension Specialist*  
*Forestry*



**Cooperative Extension Service**

University of New Hampshire

The New Hampshire Cooperative Extension Service's programs and policies are consistent with pertinent Federal and State laws and regulations on non-discrimination regarding race, color, national origin, religion, sex, age, or handicap.

Published and distributed by the University of New Hampshire, Durham, N.H., Maynard C. Heckel, Director of the Cooperative Extension Service, in furtherance of the purposes provided for in the Acts of Congress of May 8 and June 30, 1914, the United States Department of Agriculture cooperating.

# INDEX

County Extension Foresters and Assistants .....	3
Market Situations .....	5
Responsibilities of the Woodlot Property Owner .....	5
Woodlot Owner Liability .....	8
The Timber Sale Agreement .....	9
<b>Table I. Price Range Standing Timber (Stumpage) and Sawlogs Per MBF .....</b>	<b>16</b>
Belknap County .....	16
Carroll County .....	16
Cheshire County .....	17
Coos County .....	17
Grafton County .....	18
Hillsborough County .....	19
Merrimack County .....	19
Rockingham County .....	19
Strafford County .....	20
Sullivan County .....	20
<b>Table II. Prices Pulpwood Per Cord — Northern New Hampshire .....</b>	<b>21</b>
Prices of Pulpwood Per Cord — Central New Hampshire .....	21
Prices of Pulpwood Per Cord — Southern New Hampshire .....	21
<b>Table III. Price of Debarked Slabs and Edgings Per Green Ton Strapped .....</b>	<b>21</b>
Price of Pulp Chips .....	21
Average Price of Total Tree Chips and Fuel Chips .....	21
<b>Table IV. Price Range Boltwood, Posts, Railroad Cross Ties, and Switch Ties ....</b>	<b>22</b>
<b>Table V. Price Range of Hardwood Fuelwood Per Cord .....</b>	<b>23</b>
<b>Table VI. Price Range of Sawdust and Shavings and Bark .....</b>	<b>23</b>
<b>Table VIIA. Representative Operating Costs (Contract Prices) Northern N.H. ....</b>	<b>23</b>
<b>Table VIIB. Representative Operating Costs (Contract Prices) Southern N.H. ....</b>	<b>23</b>
<b>Table VIIC. Representative Operating Costs (Contract Prices) Average for N.H. ....</b>	<b>24</b>
<b>Table VIID. Representative Trucking Costs (Trucks and Loaders) .....</b>	<b>24</b>
<b>Table VIII. Wholesale Price Range of Christmas Trees and Boughs .....</b>	<b>24</b>
<b>Table XI. Retail Price Range of Single Christmas Trees .....</b>	<b>25</b>
<b>Table X. Average Maple Sap Prices at Sugar House in New Hampshire .....</b>	<b>25</b>
<b>Table XI. Maple Syrup Price Ranges for Fancy and A Grades at Producers .....</b>	<b>26</b>
Rent Price Per Tap Hole .....	26
<b>Forest Products Laboratory Publication Lists .....</b>	<b>26</b>
<b>Conversion Factors and Units of Measurement For Products .....</b>	<b>27</b>
Tree Scale .....	27
Log Rule .....	28
Pulpwood .....	28
Solid Wood Content of a Cord .....	29
Cordwood .....	29
<b>Railroad Tie Volume Table .....</b>	<b>30</b>

<b>Approximate Weight and Heating Value per Cord of Different Woods .....</b>	<b>30</b>
<b>Variation of Heating Values of Wood Due to Moisture .....</b>	<b>31</b>
<b>Approximate Number of Trees Per Cord for Peeled Pulpwood and Cordwood .....</b>	<b>31</b>
<b>Lumber (Square Edge) .....</b>	<b>32</b>
<b>Lumber Size Table .....</b>	<b>33</b>
<b>Computing of Lumber Volume in Board Feet .....</b>	<b>34</b>

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:

Roger P. Sloan  
Extension Specialist, Forestry  
862-1028

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

## COUNTY EXTENSION FORESTERS' OFFICES

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

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

**Cheshire County**  
Marshall Patmos  
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**  
Leslie B. Sargent, Jr.  
Bruce Payton  
Robert Burke  
County Court House  
North Haverhill, N.H.  
Box 191, Woodsville, N.H. 03785  
787-6944

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

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

**Merrimack County**  
John A. Conde  
Paul H. Hickey  
Extension Office  
21 Green St.  
Concord, N.H. 03301  
225-5505

**Rockingham County**  
Philip Auger  
Earle Chase  
Thomas Rogers  
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, Urban Forestry  
45 Crescent St.  
Claremont, N.H. 03743  
543-3181

David L. Buxton  
Extension Specialist, Logging  
862-1028

David E. Tooch  
Extension Specialist, Sawmilling  
862-1028

## MARKET SITUATION

The demand for timber products is largely determined by the levels of activity in key end use markets such as residential construction, residential repair and maintenance, non-residential construction, furniture, pallet and boxes, and paper products.

High interest rates have constrained borrowing, and brought activity in most of these markets to the lowest level in 10 years, causing severe dislocation in the market place. Demand for forest products declined substantially, especially for softwood products, and prices for raw materials and primary products also dropped. Demand for hardwood products and paper products remained good, resulting in steady prices for hardwood logs and pulpwood and pulp chips.

Most economists expect the adverse elements currently affecting the markets to continue into 1982, with a moderate and slow recovery by the third quarter.

## Responsibilities of the Woodlot Property Owner

Chris W. Clark, Franklin Pierce Law Center

As a woodlot owner you should be aware of property laws which may affect you and your land. If you intend to carry out forestry operations, you need to know what your responsibilities are for protecting your land and your neighbors' land. The best way to avoid problems and possible legal actions is to know before beginning what you can and cannot do.

The law in New Hampshire stems from two sources. The state legislature passes statutes. When any statute is quoted below, its chapter and section number is given and is followed by NHRSA (New Hampshire Revised Statutes Annotated). The bibliography at the end of this fact sheet lists publications with more extensive forest statutes. One responsibility of the courts is to interpret these statutes to determine how they apply in a given situation.

The other source of the law is judge-made or "common" law. Interpretations of rights and obligations of the residents of the state are developed by the various state and federal courts in the process of deciding legal disputes.

Keep in mind that while some of the material discussed here is related to the law itself, the rest is legal advice to help you stay within the provisions of the law.

### Who Owns the Timber?

Before cutting trees, you should clear up questions about the ownership of your land. Are there any mortgages or liens on your land which may affect the ownership or disposition of the timber?

If there is a mortgage on your land, it may include the standing timber. The law considers timber to be part of the real estate until it is cut down. The holder of the mortgage (the mortgagor) has the option to

require you, (the mortgagor) to obtain from him a written *partial mortgage release* before any timber is cut or sold. The mortgagee may be a lending institution, like a bank, or it may be a private concern, like the seller of the property.

Contact the holder of the mortgage. If the mortgagee is a bank, call the mortgage loan officer and ask for confirmation of the release *in writing*. The release is a simple document. For example:

"The \_\_\_\_\_ Bank (or name of individual) holder of a mortgage from \_\_\_\_\_, dated \_\_\_\_\_, and recorded in the \_\_\_\_\_ County Registry of Deeds in Volume \_\_\_\_\_, page \_\_\_\_\_; releases from this mortgage all standing timber currently marked for cutting, which is approximately \_\_\_\_\_ board feet; but this release shall not affect the lien of this mortgage on the remainder of the mortgaged property.

signed \_\_\_\_\_ (owner - you)

signed \_\_\_\_\_ (bank)

date \_\_\_\_\_

This release should be recorded in the Registry of Deeds for the county where the property is located. Other kinds of encumbrances may affect the title to your timber. Check with your lawyer if there are any attachments or tradesmen's liens affecting your property to see what your rights and obligations may be.

You may have sold or contracted away some of the rights to the timber on your land. If you have done this, get in touch with the other party involved. Make sure you both understand *exactly* what the agreement is. The other party may be under the impression that you weren't going to cut any timber.

The best way to avoid legal disputes is to consider who might have a legal interest in your timber. Then contact this person(s) and explain your intentions. Make sure that any agreement is put in writing and signed. Written agreements aren't only evidence to take to court during law suits. The primary purpose of an agreement in writing is to have a clear statement by both parties of exactly what they are agreeing to. The spoken word, however honorable, isn't as tangible. (See *Forest Fact Sheet No. 15, The Timber Sale Agreement*, for more information on making agreements and timber sale contracts.)

Check your deed to see that when you purchased the property the previous owner did not retain some or all of the timber rights. If the timber wasn't important to you at the time of the conveyance, you might not recall this detail. If you are unsure about this possibility, have your lawyer review the deed. If you can't locate your deed, a copy can be easily obtained for about \$2 from your County Registry of Deeds.

### Boundaries

After you know what you legally own, next make sure you know where your property is located. You can't be too careful about the location of your property boundaries. The law exacts a heavy penalty for cutting someone else's timber. (See below.) For a good discussion on boundary maintenance and general woodlot information get a copy of *An Introduction to Forest Management in New Hampshire* from your county Cooperative Extension Service forester.

The first step in a timber sale is to locate your boundaries as they are described in your deed. Don't rely on anyone else's word about where your boundaries lie. Mistakes are often made and these are handed down from one neighbor to the next. The law expects you to take reasonable steps to locate your boundaries accurately. A map may be attached to your deed along with the description of the property. A plat map may be recorded in the County Registry of Deeds, especially if your property was part of a subdivision of a larger parcel. Maps from the tax assessor's office are *not* always accurate and should not be relied upon.

Much of the land in New Hampshire was conveyed from very old deeds. It is possible that your land has changed character considerably since the time of the original deed description.

If you have kept your boundary markers in good shape, you should be able to avoid the cost of a survey. But if the location of the lines is uncertain, a survey is always less expensive than paying off an irate neighbor. In fact, it's a good idea to walk the lines with your neighbors. This would be a good time to explain your intentions to lumber. Then your neighbors won't become nervous when they see trees falling next door.

Disputed boundaries are settled according to the procedures set out in Chapter 472 NHRSA. Usually, a boundary settlement requires a survey. After the survey, a written agreement is signed by the abutting

neighbors stating that the new survey will be recorded as the legal boundary. Consult your county forester or a private consulting forester for help in boundary location. When your timber is marked for cutting by a forester, he can help you make certain of your boundaries. Also, when you hire a logger, make sure he is aware of where your property lines lie.

Occasionally a tree will be growing on a boundary and a property line will pass through the trunk of the tree. The law maintains that such a tree is the *common* property of the two abutting owners. In such a case, the neighbors are called "tenants in common." If one owner cuts a tree on the property line, he will be liable for willful trespass. (See below.) New Hampshire law does *not* state that each owner automatically owns every other tree on the property line. Either owner may agree to sell his rights to the tree(s) to the other neighbor. Any such agreement should be in writing and signed by both parties.

If a tree has been designated to *mark* a boundary (called a boundary tree), it is not wise to cut it. If such a tree is cut, it should be replaced by a permanent boundary marker. If you are in doubt about the status of a particular tree, *don't cut it*.

Willful trespass is the charge which may be brought against a person who cuts another person's trees without permission. The statute, Chapter 539, section 1 NHRSA reads:

"Forest Product. Whoever shall cut, fell, destroy, injure or carry away, willfully and unlawfully, any tree, timber, log, wood, pole, underwood, or bark, standing or being on the land of another person, or shall aid therein, shall forfeit to the person injured, for every pine or other timber tree so cut, felled, destroyed, injured or carried away, *five times* the value thereof and shall be guilty of a misdemeanor."

Save yourself the money and avoid being convicted of a misdemeanor. Check your boundaries; have a forester mark all timber to be cut; watch your logger and keep in touch with your neighbors. Your forester can make sure the logger cuts only the trees marked.

If a logger cuts unmarked trees on your property, he has technically breached the agreement. He can be required to pay you at least the value of the tree and usually three times the value. This should be specified in your contract. Remember, however, that on occasion it is necessary to remove a tree for access or safety. Your forester is a good judge in these situations.

### Slash and Other Requirements

"Slash" is the branches and other debris left on the ground after a timber harvest. Chapter 224, section 44-b NHRSA, details all the requirements for the handling of slash. You should become familiar with these. Your forester can give you a good explanation. Your timber sale contract should specify that the logger follow the legal requirements in dealing with the slash. All slash should be lopped to within 4 feet of the ground and kept back of property lines, buildings, roads and certain waters.

Chapter 224 NHRSA also details restrictions on cutting timber near certain streams and lakes and public highways. These restrictions limit the basal area of timber that can be cut in these areas. Again, your forester can explain this regulation to you.

## Logging

As the owner of a woodlot, you should know that logging operations can be messy. Roads must be cut, logs dragged out and heavy equipment driven around your property. When the logger is finished, your land will look different than it did before. After the trees are marked and before cutting, you can get an idea of how the land will look.

At this time adjustments can be made to sensitive areas to soften the visual impact. Just as a plumber may not mop the floor after a job, loggers often don't feel obligated to leave the area looking like a picnic ground. Since the cost to the logger of cleaning the area is high, you shouldn't expect this of him. Although the visual result of a fresh harvest isn't pretty, in a few months the natural regrowth will cover most of the logger's marks. Talk to your forester if you have never seen a finished timber sale. A forester can explain what should be expected of the logger and what is considered to be an overly critical attitude toward harvest residue. Your forester may be able to take you to the location of other timber harvests in your area to give you an idea of what is reasonable to expect. This will save a lot of hard feelings.

Be sure the logger doesn't unnecessarily damage trees which were left uncut. Your contract should note this and specify the penalties involved. Be aware that some trees must be used as "bumpers" along the skid trails. A well-planned skid trail will use bumper trees that are marked for cutting.

Some problems of logging operations are litter and woodyard debris. You should ask the logger to keep the trash in one location so he can easily haul it away.

## Roads

Make sure you agree with your logger about where any logging roads will be located. Consider the needs of future timber sales. You will want as little of your land as possible cut into roads. When it is muddy, you should shut the job down to prevent extensive damage to the roads. This is very important for erosion control and future accessibility to the property.

Does your woodlot lack an access by road? If it does, your board of selectmen can lay out an easement for access to your property. Contact them. The details of the procedure are found in Chapter 231, sections 40 through 42, (under the recodification adopted in 1981; formerly, Chapter 234). The selectmen will then assess the damages for such a

temporary right-of-way. Damages will be paid by you to the owner over whose land the easement passes.

## Other Considerations

Some towns have ordinances relating to shorelands, wetlands and steep slopes which may affect timber cutting in certain terrain. Check with your selectmen, planning board or conservation commission.

Be informed of any special requirements for your region. You may want to ask your forester about yield taxes, 'intent-to-cut' permits and road bonds.

## Conclusion

In general, be aware of the laws that affect your property and your timber harvest. Your county forester or private consulting forester can answer questions on these. Contact your lawyer if you have a more involved legal question. Remember, an ounce of prevention . . .

## Helpful Publications

*Forest Laws of New Hampshire*, available from the Society for the Protection of New Hampshire Forests, 54 Portsmouth Street, Concord, N.H. 03301, or from the Cooperative Extension Service.

*Introduction to Forest Management in New Hampshire*, available from the Cooperative Extension Service at no charge.

*Information on Timber Harvesting Laws in New Hampshire*, available from the Cooperative Extension Service at no charge.

*New Hampshire Forest Market Report*, available from the Cooperative Extension Service at no charge.

*Timber Sale Guidelines*, available from the Cooperative Extension Service at no charge.

*Hiring a Consulting Forester*, available from the Cooperative Extension Service at no charge.

*The information in this fact sheet was prepared for the Cooperative Extension Service by the Environmental Law Clinic at Franklin Pierce Law Center, Concord, N.H. It is based on the best information available. Law may be changed by the legislature or by court decision and is subject to interpretation in each individual situation. When in doubt, consult your attorney. Author - Chris W. Clark, Environmental Law Clinic, Franklin Pierce Law Center.*

*Published in cooperation with the Division of Forests and Lands, Department of Resources and Economic Development, State of New Hampshire.*



# Woodlot Owner Liability

Chris W. Clark, Franklin Pierce Law Center

Any time an activity such as a logging operation takes place on your forest land, there is the possibility of an accident. The prudent owner will not ignore this possibility, but will take precautions to minimize both the chance of an accident and its effect should one occur. This fact sheet will help you plan forestry activities.

## General Liability

The law says you must protect from harm *anyone* who you reasonably assume might come on your land. Think of the various persons who might be on your land at one time or another and ask yourself if the land is safe for them to enter. Consider loggers with their equipment, neighbors who might wander over, sportsmen, visitors and, especially, children.

You have a responsibility to know about any hazards which might exist on your property. One large source of problems is abandoned wells and old cellar holes. These should be *filled in or fenced*. Heavy logging equipment is likely to break through any covering you place over these holes. You can probably walk around your property blindfolded and not hurt yourself although this is not recommended. But look at your land from the viewpoint of someone who has never been there. What dangers are not obvious?

The best procedure is to eliminate known hazards. Until you do so, post warnings around the danger. Tell loggers about anything that you think might help them avoid harm. Ask their cooperation in not creating any hazards themselves. You will find that most loggers are very safety conscious.

Let your neighbors know about the logging operation. Tell them to be on the lookout for heavy equipment and changes in road conditions. If a log were left obstructing the road, you, the landowner, could be held liable for any resulting accidents.

Trees left standing after girdling can be hazardous. Girdling is the killing of a tree by cutting a groove around its circumference. Girdled trees can blow over during a heavy wind. Loose branches and tree tops may get caught up in other trees. These are called "widow-makers" and, for obvious reasons, you want them *on the ground*. Let people know about girdling or other logging operations on your land. Your land is your responsibility. So keep your eyes open and don't be timid. Assert safety.

## Insurance

A logger should be required to carry:

*Workmen's Compensation Insurance*

minimum amount — \$100,000 each occurrence

*Public Liability Insurance - Bodily Injury*

minimum amount — \$300,000 each occurrence

*Public Liability Insurance - Property Damage*

minimum amount — \$50,000 each occurrence

Specify the minimum amount of insurance coverage your logger should hold in your timber sale contract with the logger. Remember, the figures

above are the *minimums*. Consult with an insurance agent to see if you should require higher coverage.

Have the logger supply you with a Certificate of Insurance from his insurance carrier *made out to you*. Put this requirement in your contract as well. Then write or call the logger's insurance company and request that it send you a 20-day notice of termination or cancellation of the insurance policy. This is common practice for insurance companies and they must comply with your request.

Make certain that all workers on the operation are covered by Workmen's Compensation Insurance. Sometimes loggers will tell you they are in partnership and therefore don't need Workmen's Compensation Insurance. If the loggers with whom you are dealing maintain that they are partners, ask for a legal and recorded partnership agreement.

You may have a Homeowner's Policy issued by another insurance firm which covers your land. Get in touch with your agent and ask about obtaining a rider on the policy for extra coverage during the logging operation. It would be wise for you to sit down with your agent and explain the woodlot plan so he can advise you about the proper amount of insurance to be carried.

## The Disclaimer

The best way to minimize accidents and damage is to place the liability on the person who is best able to prevent them, in this case, the logger. The timber sale contract should include a clause placing liability on the logger for all damage resulting from the logging operation. (*Forest Fact Sheet No. 15, The Timber Sale Agreement*, will give you a sample clause.) This should include damage to buildings, crop trees, neighbors' trees and fences, bodily injury and anything on your land which might be damaged or injured.

The disclaimer should name the logger as an *independent contractor*, not an employee, and you should treat him as one. The law places greater responsibility on contractors than on employees. So, as much as possible, leave the logger alone to do his work. If he's running the show, the mistakes are his.

A landowner will often hire a logger who calls himself an independent contractor. He may, in fact, be licensed as one. But he works alone and the landowner gives him direction in the logging operation. In such a case, a court of law may rule that the landowner is actually the *employer* and the logger is the *employee*. The law is concerned with your behavior, not with the title you give yourself. Acting as an employer may result in your acquiring all the responsibilities of an employer. As an employer, you would be required to carry Workmen's Compensation Insurance for the logger and you would be liable for his accidents. Make sure the logger is insured. If not, think about getting insurance for him. At least talk to an insurance agent or attorney for advice. Don't allow the logger to avoid his insurance responsibilities by calling himself an independent contractor or saying his employees are sub-contractors or partners. Be very

careful and very tough on this point of insurance coverage. The cost is small compared to the cost of an accident.

But be aware. Don't *ignore* what the logger is doing. Any time you learn of a serious violation of your contract, have the operation shut down immediately. If you knowingly allow a problem to persist, your disclaimer may not help you.

### Fire

Fire is a great danger in the woods. A tree can do damage within the distance it can fall but damage done by fire can extend far beyond your property limits.

New Hampshire statutes deal with damage done by fire. Even if your logger accepts the liability for all the damage, you may still *not* be off the hook.

Suppose the dollar amount of the damage is far greater than the insurance coverage. If the logger is not in financially sound condition, the damaged party may come to your door looking for a deeper pocket. Generally, people will settle for the amount of insurance coverage but be cautioned.

224:34 NHRSA reads

"Every person who shall set fire on any land, that shall run upon the land of another person, shall pay to the owner all damages done by such fire."

Also, the costs of extinguishing a fire may be laid at your doorstep. NHRSA 224:28 (for towns) and

224:23 (for unincorporated places) provide that "Any person causing or kindling a fire . . . without a permit . . . when such permit is required, and any person by whose negligence or the negligence of his agent any fire shall be caused, shall be liable for the payment . . . of the expenses incurred . . . in extinguishing such fire . . ."

### Conclusion

Remember, this information is designed to help you properly manage your woodlot, not to scare you. Take an active part in making sure your property is safe.

*The information in this fact sheet was prepared for the Cooperative Extension Service by the Environmental Law Clinic at Franklin Pierce Law Center, Concord, N.H. It is based on the best information available. Law may be changed by the legislature or by court decision and is subject to interpretation in each individual situation. When in doubt, consult your attorney. Author — Chris W. Clark, Environmental Law Clinic, Franklin Pierce Law Center.*

*Published in cooperation with the Division of Forests and Lands, Department of Resources and Economic Development, State of New Hampshire.*

1/82/5M

## The Timber Sale Agreement

**Chris W. Clark, Franklin Pierce Law Center**

This information is prepared assuming that the wood lot owner who reads it is familiar with fundamental woodlot management techniques. *Introduction to Forest Management in New Hampshire*, published by the Cooperative Extension Service and available from county Cooperative Extension Service foresters is a useful guide to managing the private woodlot.

Once you understand what your management goals are, you are ready to prepare for a timber sale. Essential to a successful timber harvest, or any timber management program, is the timber sale agreement between you and the logger or the logging mill. You have made a plan for your woodlot. The agreement is designed to insure that your plan is carried out.

### A Background on Contracting

The first rule in contracting is: *put the agreement in writing*. Too often, woodlot owners arrange for wood cutting with a logger in an informal way and fail to prepare a carefully-drafted contract which is *signed* by both the *owner* and the *logger*. This may be because the owner feels that a formal contract may discourage the logger from accepting the contract. Writing the contract will help protect both the buyer and the seller. The purpose of making a written agreement is to establish a "meeting of the minds." Both parties to the agreement must know before any cutting takes place exactly what each expects from the timber harvest.

The contract must be specific. Any condition of sale mentioned in the contract should specifically state who is responsible for fulfilling each condition and how much the responsible party must pay if each condition is violated.

Every timber harvest agreement is unique. This fact sheet contains sample contract clauses which include the most important and common considerations for a timber sale agreement. The management plan which you have developed for your woodlot will require that you tailor these clauses to your own purposes and add any other desirable clauses to the contract to satisfy your requirements. Your county Cooperative Extension Service forester or a professional consulting forester can help you determine what should be contained in the contract to help make sure you attain your woodlot management goals.

### Professional Foresters

The services provided by private consulting foresters and county Extension foresters differ but are complementary.

Consulting foresters are self-employed and provide their services and expertise for a fee as do doctors and lawyers. County Extension foresters are public employees who are members of the staff of the Cooperative Extension Service of the University of New Hampshire. They carry on educational programs aimed at teaching owners of forests methods of managing these forests and marketing the products of

them. They also work to inform those who do not own forests of the importance to society of forests and ornamental trees.

The county Extension forester offers educational assistance to all who request it. At the point where actual professional management, harvesting and supervision services are required by the forest owner, a private consulting forester may be employed by the owner. In this way, public education paves the way for private enterprise.

It is always wise to have a lawyer help you prepare the contract. To get the best use of legal counsel, you should have a very clear picture of your timber sale plans. Do not avoid professional advice just to save money. A poorly-drafted contract may create problems rather than help solve those which arise.

### The Contracting Procedure

#### Negotiating the Sale

Before you draft the final agreement, you will have one or more conversations with the logger about the harvest. Make certain the logger understands that this is the negotiating process and that the final and complete agreement will be contained in a written contract. You should make it clear, when talking to the logger, that any provision agreed to must be in the written contract for that provision to be binding. This will help you to avoid hard feelings and may prevent a legal dispute.

Be certain to review all of the conditions of the agreement with the logger. This will help the logger to understand what he reads in the contract and should prevent his being surprised by what he finds in it. Take notes during any talks with the logger.

The logger will be able to explain to you his capabilities and limitations. Be reasonable in your demands on the logger but make sure the agreement is satisfactory to you.

During these negotiations, you and the logger will establish a working relationship and a rapport. This is important. Being on good terms will help, though not ensure, that the final product is acceptable to you.

Discuss with your forester and/or lawyer, the negotiations with the logger. Keeping informed everyone concerned in the sale is a good practice.

#### Drafting the Agreement

If you and the logger have thoroughly discussed the timber sale, writing the contract should not be difficult. Use the sample clauses in this fact sheet as a basic model. Include all the provisions you want in the contract.

Have your forester and/or lawyer check over the draft of the contract.

Before signing the contract, be certain the logger *reads and understands* every clause. If the logger wants to make a change in the document, make sure you understand the implications of the change. Call your forester and/or lawyer to make certain the change is compatible with your woodlot plans.

Finally, here is a note of caution. A written contract is not a guarantee of success. There is always the possibility that the logger may breach the agreement. The contract should define what constitutes a breach and how a dispute may be resolved. The most common practice for staying out of court in case of dispute is arbitration, a process of resolution by third parties. The contract should provide for the manner of arbitration.

During the logging operation, keep track of the work. Make note in writing of things that bother you. Discuss these with your forester or with the logger on a weekly basis. Make certain that problems are corrected. If the logger will not comply with the contract and you feel his breach of the contract is serious enough, shut the job down.

Occasionally a drastic change in the market price of wood will work hardship on a small operator. A revision clause in the contract will specify under what conditions a price adjustment will be allowed. Such a revision must be in writing.

Any change made in the agreement must be in writing, must be signed and must indicate that the change revises the contract.

Remember that you may put any agreement into writing but this will not guarantee that a court of law will uphold the agreement. The contract is void if it violates the law. Your lawyer will help you keep the agreement consistent with the law.

**Sample Clauses  
for a Timber Sale Agreement**

*(The number in parenthesis to the left of each clause refers to the explanation of the clause in the opposite column.)*

- (1) This agreement is entered into on the \_\_\_\_\_ day in the month of \_\_\_\_\_, 19\_\_ between \_\_\_\_\_, seller, \_\_\_\_\_/seller's address/ and \_\_\_\_\_, buyer, \_\_\_\_\_/buyer's address/.
- Witness:
- (2) **Article I** – The seller(s) agree(s) to sell to the buyer(s) and the buyer(s) agree(s) to buy from the seller(s) according to the terms and conditions stated in this agreement all the timber marked with paint marks or designated by the seller(s) or the seller's authorized agent, estimated to be \_\_\_\_\_/in thousand board feet/ more or less, on a tract of land located \_\_\_\_\_ in the town of \_\_\_\_\_, County of \_\_\_\_\_, State of New Hampshire.  
*(Hereafter singular form is used.)*
- (3) **Article II** – The seller stipulates that the seller is the sole owner of the tract of land named above and has the full right and power to dispose of the timber specified in this agreement.
- (4) **Article III** – The seller agrees to permit the buyer to enter onto the land described above for the purpose of cutting and removing the timber which is the subject of this agreement.
- (5a) **Article IV** – The buyer agrees to pay the seller the sum of \$\_\_\_\_\_ more or less, determined by the actual scale at: \$\_\_\_\_\_ per thousand board feet.
- Or**
- (5b) **Article IV** – The buyer agrees to pay the seller at the rate of:  
\$\_\_\_\_\_MBF (thousand board feet) \_\_\_\_\_ (wood type)  
\$\_\_\_\_\_MBF \_\_\_\_\_ (wood type)  
\$\_\_\_\_\_MBF \_\_\_\_\_ (wood type)  
(etc.)
- (6) **Article V** – Payment shall be made in the following manner:  
1. On a \_\_\_\_\_/weekly/ basis.  
2. Scale slips for each \_\_\_\_\_/week/ of the operation shall be furnished by the buyer to the seller or seller's authorized agent on a \_\_\_\_\_/weekly/ basis.
- (7) **Article VI** – The entire agreement between the parties is contained within this document, notwithstanding any prior negotiations.  
Any revision to this agreement must be in writing and must be signed by both parties.

**Explanation  
of Sample Clauses**

- (1) State the names of the buyer (or buyers) and the seller(s) and give an address for each party. The date the (signed) agreement is to be entered into should follow.
- (2) This clause explains the basic intentions of the parties to the contract. It should tell exactly where the tract or tracts of land are located. A map can be attached to the agreement.  
The estimation of the amount of timber in the sale is made by the forester who marks the woodlot. This is not the agreed-upon figure for the sale; the scale slips of the cut timber will tell the actual board footage in the sale. The estimate, however, is to be used as an approximate figure. If the final figure and the estimate vary by more than 10 percent, you should make inquiries to the mill and to your forester.  
The best method of preparing for a timber sale is to have the trees to be cut marked by a forester with paint. There are other methods, however, which are not mentioned in this fact sheet but they are more difficult to police.
- (3) Make certain that the timber you sell is, in fact, yours to sell. If you have any questions about title, liens or other encumbrances, see your lawyer.
- (4) This clause gives the logger "license," or permission to enter the land for cutting the timber.
- (5) There are different pricing mechanisms for the sale of timber. If the woodlot is composed of mostly one type of timber, then clause (5a) would be satisfactory. Woodlots often are composed of mixed species of trees and a rate breakdown for each type of wood should be included in the contract with wording similar to that in (5b).  
Scale is the measurement made at the mill. There are several methods of measuring scale. Your forester or logger (not your lawyer) can explain these methods and advise you on the method most commonly used in your area.
- (6) Explain in the contract when you expect payment for the operation. The general practice is to pay at the end of a week for the timber hauled to the mill that week. Specify that you want the mill scale slips delivered to you or your agent on the same time basis as well.
- (7) This is called the "merger clause." It states that the contract document contains the whole agreement. This prevents any party from coming forward and disputing the contract by saying that additional verbal agreements were made.

- (8) *Article VII* — The buyer agrees to cut and remove the timber, subject of this agreement, in strict accordance with the following conditions:
- (9) 1. Failure on the part of the buyer to comply with the conditions of this agreement shall be, at the option of the seller, deemed a breach of the agreement and subject to arbitration.
- (10) 2. No timber shall be cut except that marked or designated by the seller or seller's agent.
- (11) 3. Unless an extension of time is granted, all timber which is the subject of this agreement shall be cut and removed on or before \_\_\_\_\_
- (12) 4. Timber shall be scaled by the \_\_\_\_\_ rule and measured at \_\_\_\_\_/location/ by the \_\_\_\_\_.
- (13) 5. All trees shall be utilized in their tops to the lowest possible diameter for commercially-saleable materials. Stumps shall be cut so as to cause the least possible waste. All trees having 50 percent sound scale shall be cut and paid for.
- (14) 6. Young trees shall be protected against unnecessary injury. Buyer will pay seller for undesignated trees cut or injured through carelessness at the rate of \_\_\_\_\_ times the contract stumpage rate.
- (8) The clauses of this article are designed to instruct the logger on how this particular logging operation is to be carried out and what special restrictions you wish the logger to follow. This is the section of the contract which is most often tailored to the particular demands of your wood lot management plan. Many of these clauses are self-explanatory.
- (9) This clause defines what constitutes a breach or a breaking of the agreement. Often during the course of a timber sale there will be minor variations in the procedure agreed upon. Common sense will usually dictate when these variations are reasonable and when they cross over the threshold of the agreement. If you are in doubt about any of your logger's practices, first consult your forester. Your forester understands logging and loggers. Foresters are very good at communicating your desires to the logger. The forester will also advise you to "ease up" on the logger if your requests seem unreasonable.
- (10) Only marked timber should be cut. However, it will usually be necessary to cut an occasional tree which is unmarked. Some of the situations when this may be necessary are: for building roads, building skid trails and freeing one tree that is lodged in another. Again, your forester can tell when it is wise to cut an unmarked tree. No one goes to court over a few trees but hard feelings and some money loss can result. Have your forester act as your agent in keeping an eye on this process.
- (11) If you do not specify a termination date in the contract, the agreement could continue indefinitely. Your logger may need a short extension if unforeseen weather or other conditions have delayed the logger's work. Be reasonable but don't allow the logger to extend the operation longer than really necessary. Sometimes a logger may move on to another job which he feels is more urgent.
- (12) Specify the scale method. (See note 5.) Landowners have been defrauded by loggers who have taken the timber to a mill not specified in the contract and submitted improper scale slips.
- (13) Complete utilization of as much of the tree as possible is the goal of the woodlot owner. You want the logger to get as much lumber as is commercially feasible from the whole tree, not just the larger portions of the tree.
- (14) Felling and skidding trees usually results in some damage to other trees growing in your woodlot. Some damage is unavoidable. In fact, certain trees along the skid trail must be used as "bumpers" for keeping the logs on the trail. Skid trails should be set to use marked trees as bumpers. The point of this clause is to instruct the logger that you wish this damage to be kept to a minimum and that the logger will be responsible for unreasonable damage. Your forester can judge this.

- (15) 7. Buyer shall comply with all federal and state laws pertaining to the operation and be liable for any action resulting from this operation.
- (16) 8. Buyer agrees to lop all tops and slash to within four feet of the ground.
- (17) 9. The operator agrees to be responsible for damage caused by logging to fences, roads, trails, bridges, ditches, culverts, stone walls, fields or other improvements damaged beyond ordinary wear and tear.
- (18) Buyer may not assign this agreement in whole or in part without the written consent of the seller.
- (19) The buyer shall carry the following insurance coverages for at least the amounts following:
- a. *Workmen's Compensation Insurance*  
minimum amount \$/100,000/ per occurrence
  - b. *Public Liability Insurance - Bodily Injury*  
minimum amount \$/300,000/ per occurrence
  - c. *Public Liability Insurance - Property Damage*  
minimum amount \$ /50-100,000/ per occurrence
- (20) The buyer will indemnify and save harmless the seller and the seller's agents from any and all claims and actions covering loss, costs and damages of every kind and description which may be brought or made against seller or seller's agents on account of or in any manner arising out of the work being done under this agreement, sustained by any person, firm, or the buyer's agents, employees, contractors or sub-contractors.
- Article VIII* — It is mutually understood and agreed by and between the parties of this agreement as follows:
- (21) 1. All timber included in this agreement shall remain the property of the seller until paid for in full.
- (22) 2. All rights granted under this agreement revert to the seller on the date of the termination of this agreement, whether such termination results from the full performance of this agreement, or is so declared by the seller on account of breach of contract on the part of the buyer.
- (15) Refer to *Forest Fact Sheet No. 13, Responsibilities of the Woodlot Property Owner*, published by the Cooperative Extension Service, for an explanation of the special laws that relate to forestry and logging.
- (16) Slash is the branches and other parts of trees left on the ground after the cutting operation. See *Forest Fact Sheet No. 13, Responsibilities of the Woodlot Property Owner*, for an explanation.
- (17) The heavy equipment used for logging can be rough on the land, especially in a small woodlot. Your primary concern should be for damage done to or near any neighbor's property. Stone walls are frequent casualties.
- (18) Assignment is the transfer of contract rights from the original party to the contract to another person. To prevent your logger from assigning the cutting rights of your timber to another logger you will need to place this restriction in the contract.
- (19) See *Forest Fact Sheet No. 14, Woodlot Owner Liability*, for an explanation of the type and amount of insurance which should be carried and whom to contact for information.
- (20) This is called the indemnity clause and it is a catch-all which places liability on the logger for any accident or damage which results from the logging operation. See *Forest Fact Sheet No. 14, Woodlot Owner Liability*.
- (21) This clause maintains the ownership of the timber with the seller until the contract is fully performed. This clause will protect the woodlot owner if the logger should breach the agreement. It gives the owner control over the lumber and the actions of the logger.
- (22) Reversion to the seller of the rights contained in the agreement prevents certain misunderstandings between you and the logger. After the agreement is terminated, you will not wish the logger to cut more trees unless a new agreement is reached, nor will you want the logger using your land for any other purpose.

(23) 3. In case of disputes over the terms of this agreement, final decision shall rest with a reputable person mutually agreed upon by parties concerned and, in case of further disagreement, with an arbitration board of three persons, one to be selected by each party to this contract and a third to be selected by the other two arbiters.

(24) In witness whereof the parties have signed this agreement on the date stated above.

Witnessed:                      By Seller(s)  
\_\_\_\_\_                      \_\_\_\_\_ date \_\_\_\_\_  
\_\_\_\_\_                      \_\_\_\_\_ date \_\_\_\_\_  
\_\_\_\_\_                      By Buyer(s)  
\_\_\_\_\_                      \_\_\_\_\_ date \_\_\_\_\_

**Possible additional clauses:**

(25) The buyer may build or erect any equipment necessary, such as sawmills, for the logging operation.

*Or*

All equipment to be erected on seller's property for the purpose of logging shall first be approved by seller and its location agreed upon by the seller.

(26) The seller shall not be liable for fire losses or accidents which may occur in connection with the work by the purchaser or his employees.

(27) Permission to haul logs and equipment across any land not belonging to the seller shall be obtained by the seller.

(28) Logger shall cease logging operations when ground conditions dictate that continued hauling will do considerable damage to the roads.

(29) Seller guarantees that all boundaries are marked correctly and assumes the responsibility for any damage which is the result of incorrectly-marked boundaries.

(23) Subjecting disputes to arbitration is the most common method of solving them. By including this clause, you agree to abide by the decision of the arbitration group. The purpose of the group is to solve disputes without the expense of a judicial forum (the court). Arbitration not only saves money but the members of the group generally have a better knowledge of logging practices than a judge does.

(24) **Sign and Date the Agreement.** Signing and dating the agreement is required by law to make the agreement *legally* binding. You should have one or more third parties *witness and sign* the agreement to help insure that the document will withstand the test of authenticity.

(25) Your logger may wish to set up certain facilities such as a sawmill during the operation. If you don't want certain of these facilities, say so in the agreement. If you agree to the setting up of any facilities, your permission should be stated in the agreement.

(26) You may wish to stipulate in the contract that the logger will be responsible for any fires which start as the result of the logging operation, even though you already have an indemnity clause. (*See clause 20.*)

(27) If the logger needs to travel across someone else's property in order to get onto your land, make sure the owner of the land gives permission to cross his land. You should guarantee in the contract that the logger is allowed a right-of-way. The location of the right-of-way should be clearly specified.

(28) Logging is messy. Several considerations relate to keeping the property in good shape. You may tell the logger to halt operations when the ground conditions due to the weather make logging especially rough on the roads and skid trails. Large equipment may be restricted if you are very concerned about damage to roads and young trees.

(29) You may wish to guarantee the logger that you have properly outlined the property boundaries. This may place the responsibility for cutting a neighbor's trees on you.

(30) The seller will give the buyer the option to bid on the next cut of timber, with the right to purchase if his bid equals the high bid and he is willing to meet the other stipulations of the contract.

(31) All by-products, including fuel wood, shall remain the property of the seller.

(30) The contract can give the logger the option of highest priority at bidding any future timber sale on your property, should all things be equal. This provides the logger with more incentive to do a satisfactory job.

(31) Fuelwood and several other by-products are a result of a logging operation. You may wish to keep or sell these products and you should make arrangements with your logger to carry out any such plan. The logger, otherwise, may believe he is the owner of the products. Make this part of the contract.

*The information in this fact sheet was prepared for the Cooperative Extension Service by the Environmental Law Clinic at Franklin Pierce Law Center, Concord, N.H. Law may be changed by the legislature or by court decision and is subject to interpretation in each individual situation. When in doubt, consult your attorney. Author - Chris W. Clark, Environmental Law Clinic, Franklin Pierce Law Center.*

*Published in cooperation with the Division of Forests and Lands, Department of Resources and Economic Development, State of New Hampshire.*

1/82/5M



## 1982 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 the recommendations for selling on page 6, Timber Sale Guidelines, before disposing of stumpage, logs, and other forest products.

### Belknap County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$40-50	\$70-80	\$80-100
	Medium	55-65	80-115	105-130
	High	70-90+	115-130+	135-175+
Hemlock	All grades	25-45	60-90	85-105
Red Oak	Medium	65-90	100-120+	105-175
	High	100-150+	125-170+	175-375+
White Birch	All grades	40-70	75-110	130-200+
Sugar Maple	All grades	50-85	75-140	175-300+
Beech	All grades	25-60	75-95	80-130
White Ash	Medium	50-75	80-140	140-200
	High	80-140	130-270	200-350
Mixed Hardwoods	Pallet Stock	25-35	60-70	80-95

### Carroll County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$40	\$75	\$90-100
	Medium	70	80-115	100-130
	High	70-95	115-140	130-170
Hemlock	Medium	20-35	50-60	65-80
	High	35-40	60-90	80-120
Spruce	Medium	20-40	60-85	80-100
	High	40-50	85-100	100-135
Ash	Medium	40-60	80-90	135-150
	High	60-90	120	250-350
Basswood	Medium	25-50	50-80	85-150
Beech	Low	20	45	60
	Medium	25-30	50	65-80
	High	35-60	80-100	130-160
Beech Boltwood	High	20	30-35	70-90
Red Maple	Low to High	20-40	70	80-150
Sugar Maple	Low	25	60	80
	Medium	40	90	130
	High	70-90	110-140	135-225

### Carroll County (Continued)

Species	Quality	Stumpage	Roadside	Delivered
Sugar Maple Boltwood				\$60/cord
Paper Birch	Low	\$60	\$90	120-140
	Medium	75	120	140-160
	High	90-100	140	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
Oak	Low	40	50-60	80-90
	Medium	60-90	140-170	200
	High	100-200	170-200	350

### Cheshire County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Sawlog	\$50-85	\$70-110	\$110-150
Red Pine	Sawlog	40-50	80-90	100-140
Hemlock	Sawlog	25-50	55-65	85-110
Spruce	Sawlog	30-50	60-75	90-110
Beech	Sawlog	30-50	50-75	90-125
Poplar	Sawlog	30-50	65-85	90-115
Red Maple	Sawlog	30-50	50-75	90-130
Red Oak	Sawlog	100-180	130-220	170-425
Sugar Maple	Sawlog	60-120	90-160	100-225
White Ash	Sawlog	80-150	95-200	125-275+
White Oak	Sawlog	80-150	130-200	120-300
White Birch	Sawlog	50-85	100-160	130-180
	Boltwood	60-90	150-160	170-180
		25-35/cord	65-78/cord	94-100/cord
Yellow & Black Birch	Sawlog	50-120	90-160	100-200+
	Boltwood	60-90	150-160	170-180
		25-35/cord	65-78/cord	94-100/cord
Mixed Hardwood	Pallet	25-40	45-60	85-110
	Tie Log	25-40	45-65	110-125

### Coos County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Sawlog	\$50-80	\$100-130	\$140-175
Spruce-Fir	Sawlog	35-55	95-115	125-150
Hemlock	Sawlog	20-35	60-75	100-115
Hard Maple	Sawlog	50-85	100-140	140-220
	Veneer	75-100		160-250
Cherry	Sawlog	60-90		180-220
	Veneer	90-120		350-450

### Coos County (Continued)

Species	Quality	Stumpage	Roadside	Delivered
Soft (Red) Maple	Sawlog	\$20-40	\$60-90	\$95-130
Poplar	Sawlog	20-40	55-70	100-130
White Birch	Sawlog	55-90	100-145	145-210
	Veneer	80-140		150-350
Beech	Sawlog	20-40	70-90	100-140
Yellow Birch	Sawlog	80-110	125-175	175-225
	Veneer	100-135		160-400
White Ash	Sawlog	60-110	100-235	125-305
	Veneer	90-140		160-450
Red Oak	Sawlog	60-100	125-175	160-300
	Veneer	100-160		175-400
Basswood	Sawlog	40-70	100-120	120-160
	Veneer	45-70		150-250
Mixed Hardwood (Pallet & Tie Stock)	Sawlogs	20-40	45-60	95-120
White Cedar	6' Logs/cord*	15-25	50	75
	8' logs/cord*	20-30	60	100-110

\*6' cord = 700-750 bd. ft.  
8' cord = 1000 bd. ft. (approx.)

### Grafton County

Species	Quality	Stumpage	Roadside	Mill Delivered
White Pine	Average	\$60-100	\$80-130	\$90-190
Hemlock	Average	25-35	70-80	80-120
Spruce and Fir	Average	25-40	70-115	90-140
Yellow Birch	Average	50-130	150-215	160-240
Sugar or Rock Maple	Average	60-85	150-160	160-220
White Birch	Average	55-100	80-150	120-230
Red Maple	Average	20-35	80-100	90-130
White Ash	Average	55-100	170	160-450
Beech	Average	20-30	-----	90-100
Red Oak	Average	50-200	60-280	100-320
Pallet Mxd.	Average	25-30	80	70-90
Poplar	Average	25-35	80	110-110

### Hillsborough County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$50	\$80	\$90
	Medium	60	100	120
	High	85	120	135
Hemlock	Low	30	70	80
	High	45	90	105
Red Oak	Low	50	90	115
	Medium	90	140	170
	High	150+	200	250+
Other Hardwoods				
Birch, Maple, Ash	Low	35	70	95
Mixed Hardwood (Pallet Stock)	High Logs	85	150+	200+ 90

### Merrimack County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$40-50	\$80-90	\$105-110
	Medium	50-60	90-100	110-125
	High	60-90	90-110	125-165
Hemlock	Low	20-25	60-65	80-85
	High	25-40	65-75	85-95
White Birch	Medium	40-50	90-100	125-140
	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	90-125	200-300	225-325
Pallet Stock	Logs	25-30	75-85	95-100
Mixed Hardwood Pulp Logs				\$9-16.5/ton

### Rockingham County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$45	\$80	\$95
	Medium	55	90	110
	High	75+	110+	135+
Hemlock	Low	40	80	95
	High	50	90	110
Red & White Oak	Medium	75	120	150
	High	125+	170+	200+
Pallet Stock		40	75	95

## Strafford County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low to Medium	\$37-63	\$67-93	\$87-115
	High	64-80	94-110	114-130
Hemlock	Low to Medium	20-40	50-70	70-90
	High	40-55	70-85	90-105
Red Oak	Low to Medium	40-70	70-100	90-120
	High	71-95	101-125	121-145
Other Hardwoods	Low to Medium	30-50	60-80	80-100
	High	50-65	80-95	100-115

## Sullivan County

Species	Quality	Stumpage	Roadside	Delivered
White Pine	Low	\$40-50	\$80-100	\$100-120
	Medium	55-60	95-110	115-130
	High	75-80	115-120	130-140
Hemlock	Medium	25-30	65-70	80-85
	High	35-35	75-80	95-110
Spruce	Medium	25-30	65-70	80-85
	High	30-35	75-80	95-110
Yellow Birch & Black Birch	Medium	50-70	110-125	130-160
	High	80-85	130-140	160-225
White Birch	Medium	50-55	100-105	120-150
	High	65-70	105-130	150-180
Sugar Maple	Medium	50-70	110-125	130-160
	High	80-85	125-140	160-225
Red Oak	Medium	60-70	120-125	140-180
	High	85-100	125-160	180-225
White Ash	Medium	50-70	110-130	130-170
	High	85-90	150-180	170-225
Red Maple	Medium	20-25	75-80	85-125
	High	35-40	80-100	125-140
Pallet		15-20	65-70	85-105
Other Hardwoods	Medium	15-20	65-70	85-100
	High	20-30	70-80	90-105

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

Species	Stumpage	Roadside	Mill Yard
Spruce and Fir	\$6.00-10.00	\$32.00-37.00	\$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
All Hardwood	5.00-8.00	24.00-30.00	42.00-46.00

\*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			
Rough			
Hardwood		at Consuming	\$16.50-20.00/Ton
Rough	\$5.00-8.00	Mill	
Random Length			13.50-15.00/Ton
Mixed Hardwood		at Concentration	11.00-12.50/Ton
Random Length Softwood		Yard	13.00+/Ton

**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	
	F.O.B. Sawmill Per Green Ton	Delivered to Pulp Mill Per Green Ton
Pine and Hemlock	\$12.00	\$19.00-27.00
Spruce and Fir	12.00-14.50	23.00-30.00
Hardwood (mixed)	10.00-13.00	18.00-23.00

<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**

	Spout Prices (including stumpage)	Delivered
Pulp quality: Hardwood	\$13.00±	Depending on distance
Softwood	13.00±	
Fuel quality: Mixed Species (Biomass)	\$10.00-13.00	\$13.00-22.00 New England markets

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

Species	Stumpage	Roadside	Delivered at Mill
	Boltwood Per Cord <sup>1</sup>		
White Birch	\$20.00-35.00	\$50.00-7.00	\$75.00-106.00 per cord
Beech	10.00-15.00		50.00-6.00 per cord
Sugar Maple and Ash	20.00-35.00		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	Length	Delivered
Red Pine	5½"	7' or Multiples	\$1.00-1.25 ea.
Pitch Pine			
White Pine			
Spruce			

### Railroad Crossties

Grade	Size	Rail-bearing Face	Prices paid for Green Mixed Hardwood <sup>1</sup> Ties			
			Loaded on R.R. Cars		Delivered by Truck to Nashua	
			each	per MBF	each	per MBF
3	(6" x 8" x 8'6")		\$6.50	\$191	\$7.15	\$210
4	(7" x 8" x 8'6")		8.15	205	8.80	222
5	(7" x 9" x 8'6")		9.20	206	9.85	221

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

(7" x 9")	9'-12' long	\$210 per MBF delivered.
(7" x 9")	13'-16' long	220 per MBF delivered.

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





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

Man with Chain Saw	\$10.00-12.00 per hour
Custom Sawing —	
Softwood	100.00+ per MBF or 100.00-120.00 per hour
Hardwood	120.00+ per MBF or 100.00-125.00 per hour
Planing	40.00+ per MBF
Resawing	30.00+ per MBF

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

Sawlogs: Local deliveries	\$16.50-25.00 per MBF
Distant deliveries	16.50 for the first 10 miles and 35¢ for each additional mile.
	OR
	30.00-35.00 per hour
Cordwood and Pulpwood:	75.00-100.00 per load.

\*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		Roadside	
	Single	Bundle	Single	Bundle
Pasture Run (unimproved)				
Balsam Fir	\$2.25-3.50		\$3.25-4.25	\$5.25-8.00
Spruce	2.00-3.00		3.00-3.75	4.00-7.00
Improved (but not sheared)				
Balsam	2.75-3.75		4.75-7.00	
Spruce	2.25-3.50		3.50-6.00	
Sheared				
Balsam	4.50-6.00		6.50-8.50 to \$1.00 per foot	
Spruce	3.75-5.25		5.00-7.00	
			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 — double face				
size 12"-14"	\$2.00-2.50 each, single face	50-75¢ less		

<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 XI. Retail Price Range of Single Christmas Trees**


---



---

**(Select and cut your own)**

Scotch Pine	
Balsam Fir	
White Spruce	\$10.00-15.00 or \$2.00-3.00 per lineal foot
Douglas Fir	
Norway Spruce	
Blue Spruce	

---

**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. Maple Syrup Prices Ranges for Fancy and A Grades at Producers**

<u>Maple Syrup</u>		<u>Maple Candies</u>	
	<u>Retail</u>		<u>Retail</u>
1 gallon	\$21.00	Sugar	1 lb. \$5.00
½ gallon	12.00	Creme	8 oz. 5.00
1 quart	7.00	Candy	½ lb. 4.25
1 pint	4.50		
½ pint	2.85		
<b>Store Prices</b>			
1 gallon	\$19.00-22.00		

No New Hampshire producers make wholesale maple sugar for sale.

### Rent Price Per Tap Hole

15-30 cents for sugar maples in the woods and not too easy to get to;  
up to 30 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, 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 of 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, 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 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 Diamters 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 or by the "short cord" also called "face cord" which is a pile of wood 8 feet long, 4 feet high and the length of the stick is less than 4 feet and is generally 12, 16, or 24 inches for stove and fireplace use.

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 160 to 170 cubic feet.

### Railroad Tie Volume Table

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

### 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
6"	25
7"	16
8"	12
9"	10
10"	8
11"	6
12"	5
14"	3
16"	2.5
18"	2
22"	1



## 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 x 2	1	1-1/3	1-2/3	2	2-1/3	2-2/3
1 x 3	1-1/2	2	2-1/2	3	3-1/2	4
1 x 4	2	2-2/3	3-1/2	4	4-2/3	5-1/3
1 x 5	2-1/2	3-1/3	4-1/6	5	5-5/6	5-2/3
1 x 6	3	4	5	6	7	8
1 x 7	3-1/2	4-2/3	5-5/6	7	8-1/6	9-1/3
1 x 8	4	5-1/3	6-2/3	8	9-1/3	10-2/3
1 x 10	5	6-2/3	8-1/3	10	11-2/3	13-1/3
1 x 12	6	8	10	12	14	16
1 1/4 x 4	2-1/2	3-1/3	4-1/6	5	5-5/6	6-2/3
1 1/4 x 6	3-3/4	5	6-1/4	7-1/2	8-3/4	10
1 1/4 x 8	5	6-2/3	8-1/3	10	11-2/3	13-1/3
1 1/2 x 4	3	4	5	6	7	8
1 1/2 x 6	4-1/2	6	7-1/2	9	10-1/2	12
1 1/2 x 8	6	8	10	12	14	16
2 x 4	4	5-1/3	6-2/3	8	9-1/3	10-2/3
2 x 6	6	8	10	12	14	16
2 x 8	8	10-2/3	11-1/3	16	18-2/3	21-1/3
2 x 10	10	13-1/3	16-2/3	20	23-1/3	26-2/3
2 x 12	12	16	20	24	28	32
2 1/2 x 12	15	20	25	30	35	40
3 x 6	9	12	15	18	21	24
3 x 8	12	16	20	24	28	32
3 x 10	15	20	25	30	35	40
3 x 12	18	24	30	36	42	48
4 x 4	8	10-2/3	13-1/3	16	18-2/3	21-1/2
6 x 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> Dry      Green	Nominal	<u>Minimum Dressed</u> 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	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

\*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		