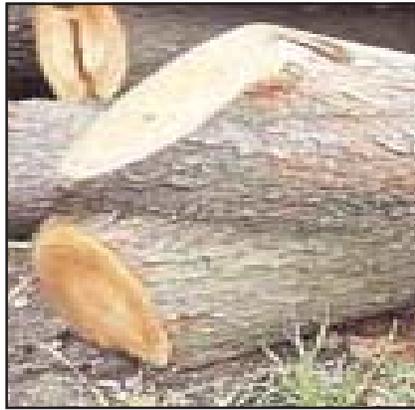


Forks in trees often develop attractive grain patterns which are desirable characteristics for various products. These photos are examples of crotchwood.



Generally, the mills using street trees are not typical high-production operations. They are smaller in size and may have different markets and product lines compared to standard production-oriented sawmills.

The keys to marketing street tree logs are:

1. Locating local sawmills,
2. Working with mills to learn sawlog requirements,
3. Making sure the merchantable sawlogs are free of metal and other foreign material,
4. Storing sawlogs until a salable quantity is accumulated, and
5. Being flexible and persistent enough to try this concept.

III. PRODUCTS & SPECIFICATIONS

Street trees that are at least 12 inches in diameter at breast height (4.5 feet from the ground) and have a log of at least six feet in length have sawlog potential. Normally, the most valuable part of the tree is the first eight to sixteen feet closest to the ground.

This butt log is being processed into firewood. If sold as a sawlog, the net return would include time and labor savings, as well as income which could be returned to the street tree management budget.



This is where the greatest volume of wood is located. It is also where the most valuable wood is found. The first log cut closest to the ground is called the butt log.

A sawmill's raw material requirements are directly influenced by its markets. Consequently, the demand and price for your potential sawlogs depends on this relationship. Knowing what a sawmill requires is an important first step for successfully merchandising sawlogs. Listed below are *general sawlog specifications* which should assist you in determining what a sawmill requires. These are *general specifications* and could vary drastically in your local area.

For example, persimmon is listed as "fair" in species desirability because most sawmills do not have a high demand for these sawlogs. However, in Tennessee there is a large market for persimmon, which centers around its use in manufacturing golf club heads. This drives up the price and demand for persimmon in that region. Similar examples exist for other species such as Osage-orange and mulberry. You must keep in mind that special markets dictate higher values for particular species, depending on local market conditions.

A. General Sawlog Specifications

General Species Desirability:

- Best:** Walnut, Butternut, Ash, Oaks (except Pin Oak), Cherry, Paulownia
- Good:** Maples, Elms, most Fruitwoods, Basswood, Sycamore, Cedar, Poplar
- Fair:** White Pine and other softwoods, Mulberry, Osage-orange, Persimmon, Beech
- Poor:** Gum, Ailanthus, Pin Oak

General Size Requirements:

- Best:** 16" or larger diameter at small end of log
8' or longer in length
- Good:** 14" or larger diameter at small end of log
8' or longer in length
- Fair:** 12" or larger diameter at small end of log
6' or longer in length
(Note: Logs should be generally sound, i.e. relatively free of rot, decay, and holes).
- Poor:** Small in length and diameter; or large in length and diameter with many knots, branches, holes, rot, or cracks; or with large or numerous metal objects.

Depending on local market conditions, special markets may dictate higher values for particular species of sawlogs.

These specifications were designed for municipalities in New Jersey. Specifications could vary drastically, depending on the part of the country you are in.

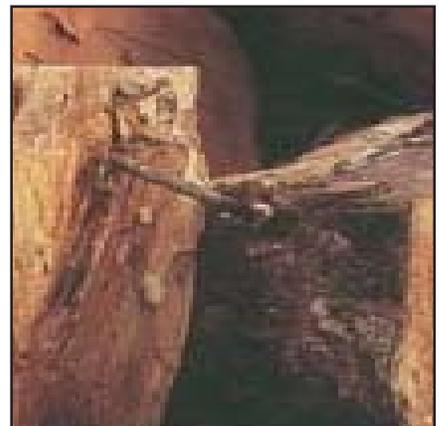
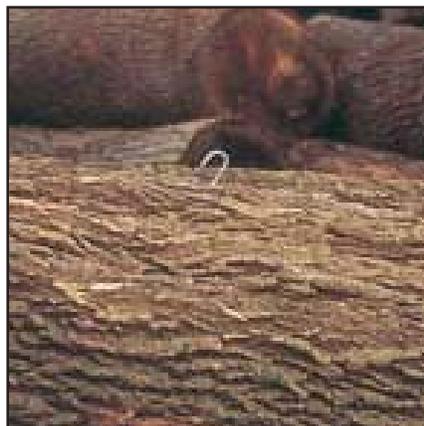
Metal and other foreign material in street tree sawlogs must be removed or the log should not be sold as a sawlog.

As depicted in these pictures, metal found in street trees comes in all shapes and sizes.

The problem of metal in street tree logs can be overcome by scanning the logs with a metal detector and removing any metal that is found.

B. Metal and Other Foreign Material in Street Trees

One of the primary reasons why demand for street tree sawlogs has been low in the past is because of metal and other foreign material sometimes found in the logs. The reputation of these logs having metal in them (i.e., nails, wire, spikes, or even car parts) is common among sawmillers.



Metal can become a serious problem during log sawing because it dulls and/or damages saw blades and sawmill equipment. It can also be a safety hazard for workers in a mill because of flying debris when a blade hits large metal objects.

The best way to correct this problem is to scan logs for metal before they go through the sawing process. Standard metal detectors are normally adequate. When metal is discovered, it must be removed. If large quantities of metal are detected in a log, it should not be sold as a sawlog. If a metal-laden log is shipped as part of a load to a sawmill, it will probably be the last load you ever sell to that particular mill.



Following a thorough visual inspection of the sawlog, use a metal detector to carefully scan for metal hidden within the log.

Normally, most metal is located within the first four to six feet of a street tree. This is the section of the tree which people use for hanging signs and securing fencing for yards or pastures. This is also the section that children like to pound nails into. Consequently, butt logs need to be screened more carefully than logs which come from higher up in the tree.

Typical metal detection techniques include a visual inspection of the log surface for metal objects like wire and protruding nails, as well as any discoloration which normally appears as a black/blue stain on the end of the log. Following a thorough visual inspection, a careful scan with a metal detector is needed.

Typical metal detection techniques include a visual inspection and scanning of logs with a metal detector.



The discoloration on the end of this log indicates the presence of metal near the stained area.

When metal is seen or detected, appropriate steps are needed to remove it. If metal is located at the end of the log, that part can be sawn off (Illustration 1). If metal is detected toward the middle of the log near the surface, then the section containing the metal can be removed (Illustration 2). Caution is needed to avoid injury. See Appendix A for chainsaw safety procedures. If you do not feel comfortable removing the metal, then mark the area with paint and let the log buyer know it contains metal.

Illustration 1: Remove the end section of the log which contains metal. You do not want to remove too much "good" wood beyond the metal, yet at the same time, you do not want to hit the metal with the chainsaw. If you are uncomfortable removing the metal, let your log buyer show you how.

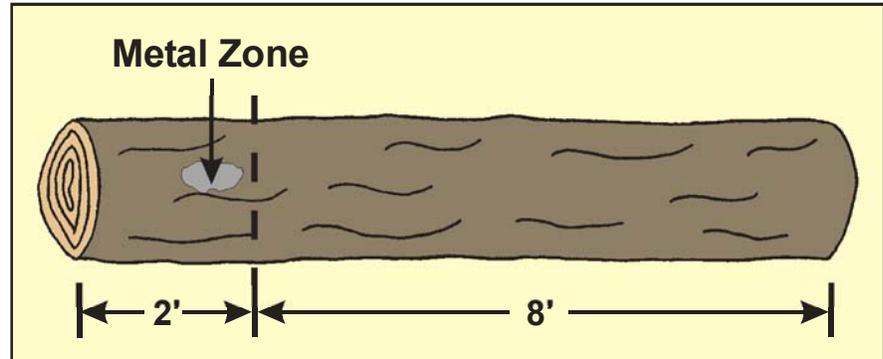
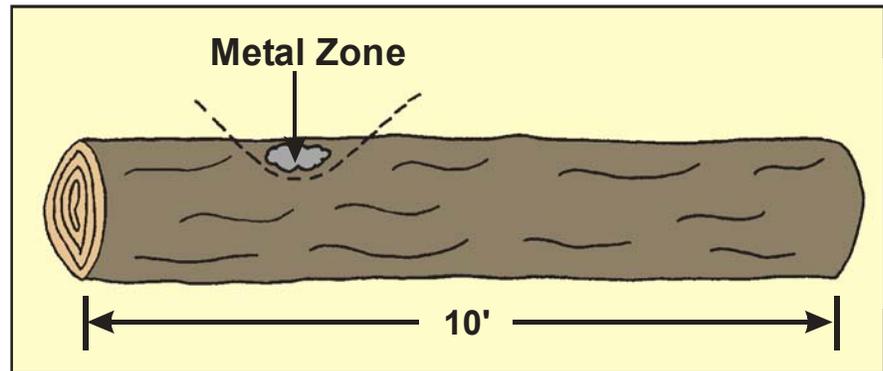


Illustration 2: Remove metal in this area provided that it is not too deep in the log. If metal is located in the first several inches of the log, removal of it will not affect the volume or quality of lumber produced from the log because this section is usually cut off in the sawing process.



Depending on where the metal is located and how deep it is in the log, a determination must be made as to whether it is worth removing (Illustration 3). If it isn't, the log should be classified unusable as a merchantable sawlog. It may be best, for the first couple of sales, to discuss these marginal logs with the log buyer.

Metal detectors vary in size, cost, and capability. Some detectors not only tell you where the metal is, but also its depth. If a municipality wants to test the sawlog market initially, a metal detector could be borrowed for log scanning.

After several successful sawlog sales, a metal detector could be purchased specifically for scanning logs. Basic metal detectors range in price from \$250 to \$500.

Safety comes first. To avoid injury, use extreme caution when removing metal.

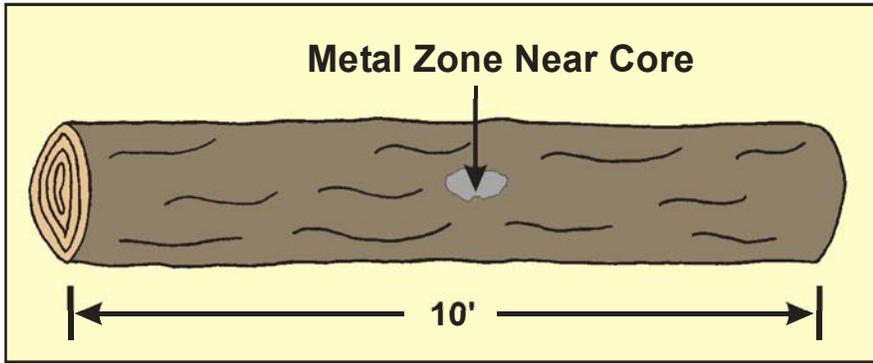


Illustration 3: When metal is located near the core of the log, removing it would drastically reduce the volume of lumber that could be sawn from the log. Leaving it could cause considerable damage to sawmill equipment. These types of logs having metal should be clearly marked (see below) and discussed with the log buyer or processed into firewood.

Listed below are some metal detector manufacturers that can be contacted for specific details:

Fisher Research Laboratory
 200 W. Willmott Road
 Los Banos, CA 92635-5501
 Phone: 209-826-3292
 FAX: 209-826-0416
 Email: info@fisherlab.com
 Web site: www.fisherlab.com

Tectron Metal Detectors
 23621 Ridge Route Dr. Suite A
 Laguna Hills, CA 92653
 Phone: 949-855-9867 or 866-Tectron
 FAX: 949-855-4903
 Email: solutions@tectron.net
 Web site: www.tectron.net

Garrett Metal Detectors
 1881 West State Street
 Garland, Texas 75042-6797
 Phone: 972-494-6151
 FAX: 972-494-1881
 Email: sales@garrett.com
 Web site: www.garrett.com

Tesoro Electronics
 715 White Spar Road
 Prescott, AZ 86303
 Phone: 928-771-@FSNOTES2646
 Email: info@tesoro.com
 Web site: www.tesoro.com/

Metal Detectors, Inc.
 P.O. Box 26440
 Eugene, OR 97402
 Phone: 541-345-7454
 FAX: 541-345-7971
 Email: sales@metaldetectorsinc.com
 Web site: www.metaldetectorsinc.com

White's Electronics
 1011 Pleasant Valley Road
 Sweet Home, OR 97386
 Phone: 800-547-6911 or 541-367-6121
 FAX: 541-367-6629
 Web site: www.whiteselectronics.com

RENS Metal Detectors
 150 East B Avenue
 P.O. Box 368
 Drain, OR 97435
 Phone: 541-836-3500
 FAX: 541-836-3580
 Email: rens@laceyharmer.com
 Web site: www.laceyharmer.com

Inclusion in this list does not constitute an endorsement of the company or nor is exclusion intended to reflect adversely upon the reputation of a company.

Other foreign material which is sometimes found in street tree logs is cement and car parts. Any non-wood material within a log poses serious problems to sawmill operators and equipment in the sawmilling process; therefore, every precaution needs to be taken to ensure that sawlogs are free of foreign materials. This effort alone could make or break the concept of a municipality merchandising logs to a sawmill.



The metal object in this log has been clearly marked to indicate its presence.



Metal detectors like the one in this photo can be purchased from many retail outlets.

Once a working relationship has been established with a sawmill and the mill manager realizes that you are taking steps to locate and remove metal and other foreign material from your logs, the mill should then become a consistent outlet for your merchantable sawlogs.

C. Proper Log Manufacturing*

In order to maximize the dollar value of street tree sawlogs, it is imperative that they are properly manufactured. The definition of "properly manufactured logs" depends on the requirements specified by the sawmill. However, the following list provides some general guidelines for proper log manufacturing. See Appendix B for additional illustrated information.

1. Safety always comes first.
2. Follow the sawmill's log specifications correctly.
3. Keep log ends straight.
4. Cut logs for highest quality. Group defects when possible, preferably near the ends of the logs manufactured.
5. Leave trim allowance on all logs in accordance with the sawmill's specifications. Normally, trim allowance is an additional 2", or in other words, a 10' log is actually 10' 2" in length.
6. Trim limbs close to the log.
7. If the base of a tree is hollow, taking a short log first may make the next log higher in quality. If a large hole is present at the base of the tree, cutting a long log would result in a loss of quality, footage, and money.
8. Standard log lengths are 8', 10', 12', 14', & 16' for softwoods and both even and odd lengths between 8' and 16' for hardwoods.
9. After a few logs are cut, have the log buyer from the sawmill come to check your logs and show you the mill's method of determining volume.

**Properly manufactured logs
are the key to maximizing the
value of logs from street tree
removals.**

*Source: More Money for Your Logs When Properly Cut, by W.G. Stump, USDA Forest Service, NA S&PF, Upper Darby, PA.

D. Log Quantities and Volume Determination

The sawmill will normally require a certain quantity of logs before a log truck is sent to your yard to pick them up. A standard log truck can legally transport about 2,500 to 3,500 board feet of logs measured by the International 1/4 Inch Log Scale Rule. One board foot is a piece of wood that is 12" wide by 12" long by 1" thick.

International 1/4 Inch Log Scale Rule is one of several log scales used in the United States to estimate the amount of lumber on a board foot basis which can be sawn from logs. To determine what log scale is used in your area, contact a local sawmill. For the purpose of this publication, we have assumed it is the International 1/4 Inch Log Scale Rule.



Sawlog volumes can easily be determined using a scaling stick.

The easiest way to estimate board foot volumes of logs is to measure them with a scaling stick. Although scaling logs might sound complicated, it is quite easy.

In order to scale logs, you need to know several things. They are:

1. Inside bark diameter of small end of log,
2. Length of log to nearest foot, and
3. Estimated amount of non-solid wood in logs (i.e. rot, decay, crookedness, etc.).

A scaling stick is a tool that enables you to determine the board foot volume of a log. It lists volumes based on the inside bark diameter of the small end of the log and its length. Thus, if a log measures 18 inches in diameter at the small end and it is 12 feet in length, you can refer to the scaling stick to determine that the board foot volume of the log is 170 board feet.

Knowing sawlog volumes will assist you in determining when you have a salable quantity of sawlogs.

When scaling a log, you need to measure the inside bark diameter of the small end and its overall length. You must also determine the approximate percent of volume loss that will result from decay, sweep, holes, etc.



If a scaling stick is not available, volume can still be determined by referring to a log volume table.

See table below for details.

International 1/4 Inch Log Scale Table*

Small end Diameter (Inches)	Length of Log (feet)					
	6	8	10	12	14	16
	Contents in Board Feet					
6	5	10	10	15	15	20
7	10	10	15	20	25	30
8	10	15	20	25	35	40
9	15	20	30	35	45	50
10	20	30	35	45	55	65
11	25	35	45	55	70	80
12	30	45	55	70	85	95
13	40	55	70	85	100	115
14	45	65	80	100	115	135
15	55	75	95	115	135	160
16	60	85	110	130	155	180
17	70	95	125	150	180	205
18	80	110	140	170	200	230
19	90	125	155	190	225	260
20	100	135	175	210	250	290
21	115	155	195	235	280	320
22	125	170	215	260	305	355
23	140	185	235	285	335	390
24	150	205	255	310	370	425
25	165	220	280	340	400	460
26	180	240	305	370	435	500
27	195	260	330	400	470	540
28	210	280	355	430	510	585
29	225	305	385	465	545	630
30	245	325	410	495	585	675

Note: The diameter to be used is the inside bark diameter of the small end of the log.

*Source: Reference Handbook for Foresters, USDA Forest Service, NA S&PF, NA-FR-15, Sept. 1989.

Both the scaling stick and table volumes assume that the log is solid and has no defects. If defects are present or if a section of the log is missing, a volume reduction is necessary. To estimate this reduction, ask the log buyer to explain how to estimate volume reductions or refer to the USDA Forest Service publication, Grading Hardwood Logs for Standard Lumber. This publication describes the process of log grading, log scaling, and methods for determining scaling reductions. Copies may be obtained by contacting the Forest Service at the address below:

USDA Forest Service
1720 Peachtree Road, NW
Atlanta, GA 30309
Phone: 404-347-7206
FAX: 404-347-2776
Web site: www.southernregion.fs.fed.us

Remember, you will not be measuring logs as accurately as a sawmill. The purpose of your log scaling is to give you an idea of how much log volume you have.

Log scaling sticks and tally sheets (forms for recording log volumes) can be purchased from the following companies:

Ben Meadows Company
P.O. Box 5277
Janesville, WI 53547-5277
Phone: 800-241-6401
FAX: 800-628-2068
Email: mail@benmeadows.com
Web site: www.benmeadows.com

Forestry Suppliers, Inc.
205 W. Rankin Street
P.O. Box 8397
Jackson, MS 39284-8397
Phone: 800-647-5368
FAX: 800-543-4203
Email: fsi@forestry-suppliers.com
Web site: www.forestry-suppliers.com

If you know the approximate board foot volume of logs your sawmill's truck can handle, you can better determine when you have a truck load of logs ready for pick up.

E. Storage Requirements

As stated earlier, in order for a sawmill to pick up a load of sawlogs, the mill will need a predetermined quantity of logs. This quantity will depend on the size of the truck. Therefore, the sawmill will give you an estimated volume figure that their log truck can legally handle. For example, if a sawmill's truck can safely transport about 3,000 board feet (bf) of oak logs at one time, and one 18" x 12' log is 170 bf, then about 18 oak logs of this size would be the approximate load for this truck.

Maximum load limits are based on weight. Consequently, the quantity of logs shipped on a log truck will vary depending on the species mix, moisture content, log size, etc. For example, red oak logs are heavier than basswood; therefore, fewer red oak logs of the same size can be transported as the same size basswood logs.

The storage area at this municipal yard is relatively small, yet there is enough room to store a truck load of logs.



Keep in mind that you will need a storage area for the logs somewhere in the municipality. Depending on topography, one-fourth

acre of flat land could be sufficient, provided that a log truck can easily park next to the logs.

Adequate log storage space is critical to successfully market your sawlog material. Here, sawlogs were stored by the municipality until enough logs were accumulated for a truck load.



F. Log Loading and Unloading Safety Procedures

Safety should always be the number one priority when dealing with heavy, movable materials such as logs. The Occupational Safety and Health Administration (OSHA) has regulations pertaining to safety in logging operations. Within these regulations, log loading and unloading procedures are identified. Consult Appendix A for a listing of the logging operation safety procedures.