



# Woodland Owner Notes

## Producing Firewood from Your Woodlot

*A century ago wood supplied most of North Carolina's energy. That share dwindled to less than one percent as energy consumption increased but people switched to coal, oil, and natural gas (much of it used in production of electricity). In the 1970s, steep price increases for nonrenewable fossil fuels led to renewed interest in firewood for domestic heat.*

What does this mean for North Carolina's quarter-million woodlot owners? Up to a million households in the state consume a cord or more of firewood each winter. Energy experts predict a sustained level of home firewood use, as well as increasing competitive markets for "low value" wood for various chip products.

Many foresters are enthusiastic about the woodlot management opportunities created by firewood demand. The state remains two-thirds forested, and more than half of that forest is hardwood. One of the most discussed forest management problems in recent decades has concerned the abundance of small, poor quality hardwoods. Forest landowners have not had good markets for an increasing volume of "green junk" accumulating on their woodlots. Firewood cutting can help solve that problem.

Woodlot owners can benefit from firewood production in at least three ways:

1. Save fuel cost by burning firewood.
2. Generate income by selling firewood.
3. Improve timber quality, species composition, and growth rate by removing undesirable trees for firewood.

### Firewood and Forest Management

Firewood removal can contribute to timber production and other management objectives if the woodlot owner carefully decides when, where, and how to cut that firewood. Opportunities can be broadly grouped as they relate to conventional harvesting: "Following Timber Harvest," "Prior to Timber Harvest" or "Intermediate Stand Management."

### Following Timber Harvest

The best opportunities for firewood production are found immediately after the sale of merchantable timber. Crop trees have already been harvested, so they do not interfere with access or processing and they cannot be damaged or "underutilized." Limbs and tops, as well as residual trees, remain available for use as firewood. The landowner's plan for regenerating a stand not only can incorporate firewood removal, it can benefit from that removal.

On sites where pine has been harvested, reestablishment of pine is generally a good investment. Whether from natural regeneration or from planted seedlings, the establishment of pine reproduction is helped by controlling or reducing residual material. This

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frequently includes many standing hardwood trees. Chemical control of hardwood stumps as the trees are cut for firewood can reduce the competitive threat from resprouting.

Where regeneration of a hardwood stand is desired, in many cases it is a good practice to cut all standing trees. Those trees which remain after harvest are generally of low value because of stem defect, poor form or species. For the same reasons, they are not likely to develop into valuable crop trees. After felling all stems, the new stand can develop from seeds or sprouts, depending on the species, condition, and site. Stumps of small trees cut closely to the ground (lower than 6 inches) during the fall or winter provide the most vigorous sprouts. Regeneration from seeds may be obtained from the current year's crop on harvested or nearby standing trees, or it may come from the accumulation of previous years' crops already on the ground.

### Prior To Timber Harvest

Removing firewood from a mature timber stand prior to harvest requires more care than a post-harvest operation. Marketable "crop" trees which will be sold for timber at future harvests must be identified so they will not be damaged when other trees are removed. Trees to be removed for firewood include those with crooked, dead, partially rotten, diseased, and small stems as well as those of undesirable species. Although access throughout the stand is generally easier before harvest than after, available firewood volume can be much less, and its removal without damaging crop trees can be difficult. A well-done preharvest firewood cutting can reduce logging costs and enhance the appearance and perhaps the harvest value of the remaining stand.

### Intermediate Stand Management

Management of existing stands should include only those activities that protect, upgrade the quality or improve the growth rate of potential crop trees. Crop trees must be identified by their anticipated performance and merchantability which, in turn, depends on species, vigor, form, and quality as well as markets.

Desirable species vary with location and site quality but frequently include yellow-poplar, gum, ash, walnut, oak, and pine. Crop trees should have dominant or co-dominant crowns so they must be as tall as most of their neighbors. Trees with the longest, straightest stems and small branch diameters are excellent crop trees. Trees with insect, fire or mechanical damage, or small shoots sprouting from the limbs and trunk are not of high quality and may be removed for firewood.

Crop trees compete for space to grow. Proper distribution of crop trees depends primarily on the individual tree's size, but

distribution is also affected by species, age, and site quality (Table 1).

**Table 1. Approximate spacing for crop trees by diameter.**

Diameter of Crop Tree <sup>1</sup> (Inches)	Distance to Adjacent Crop Trees (Feet)	Approximate Optimum Number of Crop Trees (Per Acre)
6	10	300-500
8	13	200-300
10	16	125-200
12	20	100-125
14	24	70-100

A stand that has substantially fewer crop trees than indicated should be considered for harvest and regeneration. Poor cutting practices, grazing, fire, and mismanagement have created many such degraded, poor quality stands.

Stands which contain an adequate number of crop trees in addition to some cull trees can benefit from timber stand improvement (TSI) cutting. Large cull "wolf" trees, unmerchantable species, crooked and forked stems, fire scarred, damaged, diseased, and dying trees could be removed. Dead and decaying snags left standing can have considerable wildlife value. Smaller "understory" and "suppressed" trees may also be removed. While understory removal does not particularly benefit crop trees, it does use material that otherwise might not be utilized.

Some stands have so many trees with crowns in the main canopy that the growth rate of crop trees suffers. These stands should be thinned, paying attention not only to crop tree characteristics and protection, but also to crop tree spacing and distribution. The ultimate objective of such management is vigorous, uniform diameter growth of crop trees.

Most firewood thinning opportunities are found on sites which are moderate to good quality in stands between 20 and 60 years old. Such stands can supply half a cord per acre of firewood each year while simultaneously producing a valuable timber crop. Older stands may lack the vigor to respond to thinning. Younger stands should not be thinned because crop tree identification and response are uncertain. Thinned, very young hardwood stands are particularly vulnerable to damage from ice, snow, and wind. Also, releasing young hardwood trees frequently reduces quality because branches remain, or sometimes form, lower on the stems.

### Administering Firewood Removal

There are many ways to conduct firewood removal, ranging from the give-away of logging slash and residuals to the complete processing and sale of cut, split, and delivered

<sup>1</sup> Diameter of trunk 4 1/2 feet above the ground.

wood. Near metropolitan areas, firewood cutters may pay as much as \$10 per pick-up truck load for "firewood stumpage" (permission to cut and remove standing trees or material on the ground). The best method for conducting firewood removal depends upon accessibility and distance to market as well as the amount of time, interest, and energy available to the landowner.

Most landowners have found it necessary to control both access to, and the cutting of, firewood. Control may be exercised by issuing permits for specific dates and times or by distinctly marking the boundaries of areas where wood can be cut. County forestry offices and extension centers often maintain lists of firewood cutters, cutting areas, and local market information.

Administration of firewood sales can affect how well the woodlot owners' objectives are accomplished. Selling everything within a marked boundary is frequently effective in motivating a cutter to clean up an area. Sale of wood by the pick-up truck load may improve control, but can also discourage removal of small, rough, and hard-to-reach trees.

## **Safety**

Firewood cutting and any chain saw operation is extremely dangerous so it must be done with care. The cost of even a minor accident can more than offset any potential value or saving. Dead trees and "leaners" are particularly hazardous because they can break and fall unexpectedly while being

cut.. Consider leaving dead snags in the woods for their wildlife value rather than taking the high risk of felling them.

Chain saws are the major cause of accidents among professional loggers (who presumably understand the risks and know how to operate them safely). Firewood cutters should take appropriate precautions. The chain saw operating manual should be thoroughly read and understood before operating the saw. Learn safe techniques, use well-maintained equipment, wear appropriate clothing and protective gear, and avoid excessive fatigue.

If others are cutting firewood on your property, require them to work safely. Provide separation between cutters so they do not endanger each other, but do not allow anyone to work alone. It is always advisable to carry adequate liability insurance.

## **Summary**

Producing firewood from a woodlot can be an excellent forest management opportunity. Properly marked and administered, firewood cutting can produce immediate income while increasing the long-term value of the woodlot. However, cutting the wrong trees for firewood is as senseless as burning the furniture those trees could have produced. Ask a forester how firewood cutting could fit into your management plan and improve your woodlot.

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Published by

NORTH CAROLINA COOPERATIVE EXTENSION SERVICE