Ask A Professional

Peter Smallidge

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Landowner questions are addressed by foresters and other natural resources professionals. Landowners should be careful when interpreting answers and applying this general advice to their property because landowner objectives and property conditions will affect specific management options. When in doubt, check with your regional DEC office or other service providers. Landowners are also encouraged to be active participants in Cornell Cooperative Extension and NYFOA programs to gain additional, often site-specific, answers to questions. To submit a question, email to Peter Smallidge at pjs23@cornell.edu with an explicit mention of "Ask a Professional." Additional reading on various topics is available at www.forestconnect.info

Growing Volume and Value on the Best Trees

Question:
I want to manage my woods for the future production of high quality timber. What do I need to do to make sure I'm growing the most value and volume on my best trees?

Answer:
Sawtimber from private woodlands can provide significant opportunity for income to the owner. As with most endeavors, there is a right and wrong way to approach sawtimber production. Growing and harvesting your sawtimber needs to be coupled, ultimately, with appropriate efforts to ensure the successful regeneration of the next forest of equally high value trees. A number of additional resources are listed at the end of this article.

Volume and value have a connection. Volume is the amount of wood in the tree, and for sawtimber is measured as the number of board feet. Value is how much each tree is worth, and is influenced by numerous factors including the volume per acre, species, distance from road, accessibility, and more. Hardwoods tend to have more value per tree than conifers, but a well-managed conifer stand can have significantly more volume per acre. On average, hardwood management will typically produce more value than softwood management. On an average acre, most of the value of hardwood sawtimber will occur in 50 to 75 of the best trees.

An assessment of your woodlot will identify the areas to initiate management activities. Contact a state agency forester or hire a consulting forester to help identify those areas (called stands), and to delineate them on a map. If you already have a stewardship plan, a stand map is likely included. A stand is a management unit that might be a few to many acres in size. Within a stand, rather than among stands, there is greater similarity in terms of the mixture of species, soil characteristics, tree ages and tree size structure. Tree size structure is determined from measuring tree diameter 4.5' above ground, known as diameter at breast height or dbh. Some stands may be mature, and you could work with your forester to begin the regeneration process. The regeneration process is a separate discussion, but note that sustainable management requires more than cutting the large valuable trees and hoping that other trees of good future value will dominate the site.

There are at least four characteristics of stands you should prioritize as you begin managing for high value sawtimber. First, align your stand map with a soils map and consider which stands occur on soils that have high, medium or low productivity. The most productive soils will produce the best results from management. Second, select stands where the dominant tree species are suited to the soil, and the species are of high value. Most species grow well on productive soils, but not all species grow well on less productive soils. When a species grows on an appropriate soil the tree will attain its best growth and be less vulnerable to the effects of insects and disease. Third, select stands that have enough trees per acre, foresters call this "stocking", to force the trees to compete for sunlight. Competition for sunlight in trees less than 5 to 8 inches dbh will help train the trees for straight stems and will promote self-pruning of side

This picture shows a two-stem fork (top and bottom lobes) and the callus tissue overgrowth (left and right lobes) trying to compensate for a splitting stem. Trees with weak forks, such as shown here, should not be favored for future sawtimber growth. These will eventually split, leaving behind a low-value stem and potentially damaging a nearby higher value stem in the process.

Chainsaw girdling of trees, such as was almost completed in the picture, needs to completely connect the cuts. Girdling allows for quick control of competing unfavorable trees, but leaves behind trees that will eventually fall. Be judicious about if, when and where you girdle.

branches. Manual pruning is costly and often not profitable on larger trees or when lower branches exceed 1 inch in diameter. Finally, stands that have the largest average dbh of desired trees will more quickly reach maturity, and thus provide the fastest return on your management investment.

Once you have assigned a priority of order to each stand, you can begin to improve tree volume and value. Value per acre is optimized by concentrating growth (i.e., volume) on the best trees. In most woodlots, growth is limited because trees compete with adjacent trees for sunlight. Increasing growth, and thus value, may require you to cut or kill (e.g., girdle) less favorable trees so that the best trees can thrive. Work with your forester to determine which stands are overstocked and thus have trees competing for sunlight.

Favorable trees, those onto which you want to concentrate growth, include those species that have good local markets and value, are matched to the soil, have a limited numbers of stem defects, and have a good crown. Stem defects include branch knots, seams, rotten spots, damage from past equipment injuries, etc. Stems with fewer external defects will typically have fewer internal defects. This grading of standing trees as timber will require considerable practice, but will help ensure you concentrate growth on the best trees. Favorable trees should have a large and healthy crown of foliage to respond to the increase in sunlight.

Once you have determined which stands are over-stocked, you can begin to thin the stand for improved tree growth. Thinning is a process which emphasizes the growth of the current trees, and is not a process to regenerate the forest. Forest regeneration is a separate and distinct activity. There are two strategies that might be used to spatially arrange the cutting of trees in a stand. First, if you have a fairly large number of favorable trees per acre you may want to thin to a residual stocking level. With this strategy the cutting is distributed more or less uniformly throughout the stand. Alternatively, if you have few favorable trees per acre you can be more efficient by using a tree-centered strategy known as crop tree management. With crop tree management the cutting occurs only to release the favored (i.e., retained) crop trees from competition. The specifics of these two options are more involved than can be covered here, but are discussed in a webinar listed below in the *Resources* section.

Whether you use the residual stocking or crop tree strategy to thin, focus your efforts on trees with crowns that occur in the upper canopy. Upper canopy trees are as tall as or taller than neighboring trees. Lower canopy trees have limited access to sunlight, have small and often flat-topped crowns, and have proven themselves as runts and losers. The growth response of upper canopy trees will be 3 to 8 times greater than the growth response of lower canopy trees.

As mentioned previously, thinning involves reducing the competition for sunlight between favored and unfavored adjacent trees. The unfavored trees can be cut or killed standing. Cutting trees requires special skills that are best learned through an educational program known as the *Game of Logging*. Killing standing trees can be completed by girdling. Girdling disconnects the foliage of the crown from the roots. Girdling is either mechanical or chemical, but in all situations leaves a dead standing tree in the woods that might be a hazard to you, family members or loggers. Be judicious in your decision to girdle trees. The cutting and killing part of the sawtimber management process is where you have the greatest opportunity to improve or degrade the value and quality of your stand.

Although specifics will vary with soil

continued on page 19

Growing your best high quality timber often involves cutting or killing unfavorable trees that compete with favorable trees for sunlight. The black cherry with blue paint is a desirable species, but has stem qualities making it inferior to its unmarked adjacent black cherry. Photo: Jerry Michael).

conditions, you will want to delay harvesting your best trees until the average stand dbh of the dominant trees is about 18 inches. Your forester can help initiate the regeneration process as the stand grows and matures to its optimal, average dbh.

Some stands will have large numbers of unfavored trees that do not compete with favored trees for sunlight. It is not necessary to cut or kill all unfavored trees. In fact, if you cut too many trees, you will allow too much sunlight to the forest floor and trigger an understory response. The species in the understory may be desirable or undesirable. There may be value in cutting or killing some additional non-competitive unfavored trees to limit seed sources, but talk through the options with your forester.

If the trees you plan to cut have sufficient size and value in local markets, the thinning treatment could be commercial. Commercial thinning involves a logger who buys the marked trees from the owner, cuts the marked trees, and extracts them from the woods with no or minimal damage to the residual trees. Work with a forester and have a contract if you undertake a commercial thinning. The financial return to the owner might be quite small per acre, but the gain is in having someone else do the work to your standards. If the unfavored trees don't have value, you will either need to hire someone to do the work, or complete the work yourself. Be cautious about allowing a well-intentioned neighbor or relative "help" you thin as they collect firewood. Someone who lacks adequate skill, equipment, training, or awareness can cause numerous problems and do significant damage to what would have been your future sawtimber trees.

Once you have identified stand boundaries, prioritized stands for treatment, selected trees to favor, and thinned stands to concentrate growth on the best trees you can wait for the wood to accumulate. You might consider entering the NYFOA/ForestConnect *Timber Growing Contest* where owners mark, measure and follow the growth of trees as a way to better understand volume and value growth of trees.

Thinning to release favored stems, such as this 14 inch dbh red oak will result in slash or debris from the crowns of the cut trees. This slash can be left in the woods to slowly decompose for nutrients and as habitat for a variety of wildlife.

Resources

Publications at *www.ForestConnect.info*

- Glossary of woodlot terms
- How to scale and grade hardwood standing timber (Univ. Arkansas)
- Tree Value: A Basis for Woodland Management (1981 Conservation Circular)

Webinars recorded and stored at www.Youtube.com/ForestConnect

- July 2008, Jim Finley, Growing Quality Hardwoods
- February 2012, Dave Jackson, Forest Vegetation Management Using Herbicides
- March 2013, Peter Smallidge, Thinning to Improve Forest Growth and Health
- February 2014, Peter Smallidge, Are You Growing Your Best Timber (see also rules for the timber contest at *www.timbercontest.com*).

Educational events calendar at *www.CornellForestConnect.ning.com*

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