



Supporting Sustainable Management of Private Woodlands

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Selecting Trees to Retain During Thinning

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Thinning your woods is analogous to weeding your garden; you remove undesirable plants while providing more sunlight to the desired plants. In most northeastern woods, sunlight is the environmental variable that most limits tree growth. Trees that grow well are more competitive with their neighbors and better able to recover following stress events. Water and soil nutrients are important, but typically these don't limit growth. Providing adequate sunlight to a tree is also easier than trying to increase water or soil nutrients. Faster growing trees also typically produce more tangible outputs such as timber, fruits and nuts, and wood volume for firewood.

The process of thinning requires some amount of equipment and work. All equipment has safety considerations that warrant attention. Chainsaws are a common tool and necessitate the use of chainsaw chaps and protection for your head, ears, and eyes. The Game of Logging is a particularly useful training program before felling trees. Some owners will use herbicides to kill undesired trees. All herbicides (a type of pesticide) have labels with useful information about mixing ratios, timing of treatment, amount of product to use, and personal protective equipment.

Thinning is essentially an investment of sunlight in those trees and other plants that are retained (Figure 1). Because trees grow slowly and take years or decades to mature, the investment should be carefully planned to optimize the re-turn. Thinning also provides sunlight



Figure 1. Upper crown class trees, such as the deciduous hardwood on the right, have large crowns and are capable of responding favorably to increased sunlight. Misshapen crowns, such as the conifer on the left indicate a tree that has been competing for sunlight. Lower crown class trees are shorter than their neighbors.

to other plants that remain in the woods, and some, like interfering plants may also respond with increased growth or abundance. Be alert to all the plants that might benefit from the increased light (Figure 2).

There are two components to selecting desirable versus undesirable trees. First, consider the characteristics of certain species based on ownership objectives. If the identity of a tree is unknown, post a high quality picture of foliage, buds, and bark in the forum at www.CornellForestConnect.ning.com, contact a MFO volunteer, or review the tree identification webinars at www.youtube.com/Forest-Connect.

Most owners have an interest in healthy trees, and only trees growing in suitable soils maintain their health. Therefore, a common ownership objective would be to ensure that trees favored for retention during a thinning are suited to the soil conditions. The NRCS has their online Web Soil Survey that can be used to identify soils in the area of the thinning and lists of species that grow well on those soils. The county Soil and Water Conservation District can also provide assistance with soils. Other owner interests might include some combination of timber production, wildlife, or aesthetics. The US Forest Service Silvics Manual, available online, lists all our trees and their utility for various owner objectives. Thus, start by reviewing the tree species present in your woods, determine if they are suitable for your soils, and determine which have qualities that match your interests. See more in a blog about "Google Earth and Web Soil Survey" at <http://CornellForest-Connect.ning.com>"

The second component of the selection process, after identifying a tree species, or groups of species of interest to the owner, involves three aspects of the tree. These three aspects relate to the tree's ability to respond to the investment of light through a long potential life and with increased growth.

The Crown – The crown of the tree is the leafy portion. The leaves photosynthesize and produce the starches and sugars used by the tree for growth. The crown is one of the most important attributes of a tree to judge. The crown of a desirable tree will be in the upper crown class, a position of height equal to or greater than the tallest trees in its vicinity. An upper crown class tree will have a wide crown that is directly exposed to sunlight. Lower crown class trees tend to have smaller crowns, often tapered towards the top or flat topped, and indirectly receiving sunlight. With increased sunlight, upper crown class trees may grow three to eight times faster than lower crown class trees. The crown should not have evidence of dieback or



Figure 2. A weak fork often has a flared ridge below the fork. The flared ridge results from callus tissue the tree produces in response to stress on the wood tissue of the fork. The bigger the flared ridge, the greater and longer the stress. Wood decay, as seen in the cross section, often accompanies weak forks.



Figure 3. Insects such as sugar maple borer, and many decay fungi, cause deformities in stems that weaken the stem and increase its susceptibility to breaking during wind or ice storms. While these stems may last many years, trees eventually fail, and have competed with potentially better trees during that time.



Figure 4. Damage at the base of a tree from old logging or firewood harvesting activity, or other mechanical injuries, may support decay organisms in the stem or the roots. Roots are hidden, but an essential part of a healthy tree.

dead branches in the upper portions, and if foliage is present the foliage should be of normal color and form. Finally, crowns that are distinctly forked at a main branch, especially when the fork is subtended by a flared ridge, may be prone to breakage. Crown dieback, lower crown class trees, abnormal foliage development, and weak forks suggest trees that may have limited longevity and thus not good investments.

The Stem – The stem of the tree is often the focus of owners with a timber interest, and for good reason. However the stem of the tree, when viewed from a perspective of longevity, is limited mostly by conditions that might compromise the structural integrity of the tree (Figure 3). Stem cankers, insect activity, weak forks as described above, or damage from nearby falling trees are all examples of problems. These problems

might directly reduce the stem's structural integrity or contribute to its decline as a site of entry for decay organisms. Trees with multiple stems are often not as desirable as single stem trees, but other factors may warrant favoring a multiple stemmed tree.

The Roots – We can't see the roots, but we can look for activities that might indicate a compromised root system. A compromised root system is a predisposing stressing condition that would be compounded by subsequent stressors. Trees can usually manage single stressors, but multiple stressors often lead to significant reductions in growth or outright mortality. Indications that a root system might have been subjected to stress include scar tissue or a "cat face" at the ground level (Figure 4), a significantly flared butt of the stem, or a tree growing adjacent to a historic skid or tractor trail suggesting roots damaged by compaction. These historic wounds can be compartmentalized fairly well by some species such as sugar maple, but not well by species such as red maple, aspen, or beech. Compartmentalization slows the spread of decay into other parts of the tree.

Selecting acceptable trees worthy of an investment of sunlight will require some practice. Start with a written list of owner objectives, know what species are suited to your soils, and look for signs of healthy crowns, stems and roots. It is often more productive to focus on releasing desired trees from competition for sunlight than it is to cut all trees that lack desired qualities.

For additional information on woodland management go to:
www.ForestConnect.com & www.CornellForestConnect.ning.com



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