



# Sustainable Forestry VERSUS Diameter Limit Cutting

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**F**orest ownership carries an opportunity to practice sustainable forestry. In this sense, *sustainable* means managing the forest in such a way that it provides a continuous output of products and services, without causing lasting harm or affecting forest productivity (Schuler and McGill, 2006). *Diameter limit cutting*, as described here, generally is counter to sustainable forestry.

## **Diameter Limit Cutting Defined**

Diameter limit cutting is the practice of harvesting all merchantable trees above a specified diameter (for instance 16 inches and larger in diameter). This practice is a form of

*high-grading*. In forestry, “high-grading is the removal of the most commercially valuable trees (high-grade trees), often leaving a residual stand composed of trees of poor condition or species composition” (Helms, 1998).

With diameter limit cutting (DLC), timber diameter is measured either at 4.5 feet above ground level (referred to as ‘diameter at breast height’ or DBH) or at stump height. The diameter is normally selected based on tradition, financial needs, tree species, the cost of harvesting, ease of implementation, and local sawmill demand. In most cases, however, DLC does not remove undesirable species, culls, or poor-grade trees that fall within the specified diameter limit. Nor does DLC harvest the smaller unacceptable trees with diameters below the specified diameter limit.

Such trees have little investment value and should be thinned to promote stand improvement. What DLC does do is sacrifice immature, desirable crop trees before they reach economic maturity – trees, which if allowed to grow, could develop into high-quality, top-value timber desired by the hardwood industry.

## Why does DLC Happen? The Pros and Cons

Diameter limit cutting occurs for the following four reasons:

**High Initial Revenues** – Diameter limit cutting liquidates more timber assets up-front and improves current revenue, but largely neglects future timber sale income. Merchantable hardwood timber broadly falls into three categories, including pulpwood (6 – 11.9 inches DBH), small sawtimber (12-17.9 inches DBH), and large sawtimber (18 or more inches DBH). Market value generally increases as timber size increases, yet DLC often removes small sawtimber. Although small sawtimber can be sold with DLC to increase current income, such timber often is financially immature. If left to grow, particularly if good quality, small sawtimber can gain substantial value as an investment.

**Ease of Application** – When harvests are in the planning stage and parameters are being set, diameter limit cutting is simple to understand. Cutting specifications and terms are easily settled upon. Landowners and their loggers must agree on the property boundary, size, and species of trees to be harvested, and the price per unit. Once these are set, cutting begins. Professional foresters are normally not involved in planning the timber harvest – i.e., evaluating the stand and its regeneration prospects, prescribing a properly marked harvest, and ensuring that sustainable forestry is being practiced.

**Value System** – Diameter limit cutting is a common alternative to clearcutting. Timber stands are often in poor condition due to previous mismanagement. In such cases, an accepted practice is to harvest all trees in an effort to regenerate a more desirable stand. This is clearcutting, and for some, clearcutting is undesirable due to ownership values and alternative objectives, such as recreation and aesthetics. Diameter limit cutting often becomes the default to clearcutting in these cases.

**Tradition** – Diameter limit cutting has endured through time. It is perpetuated with a common misconception that smaller trees left as residuals are younger, and that harvesting the larger (assumed to be older) trees will provide the smaller (assumed to be younger) ones room to grow. In many cases, the smaller trees are the same (or nearly the same) age as their larger counterparts (Clatterbuck, 2004). With each successive diameter limit cut, the ability of a forest to ‘earn its keep’ is diminished. Slow-growing, poor-quality residual trees rarely become future champions.

## Forest Management Options Following Diameter Limit Cutting

Landowners and forest practitioners are regularly faced with decisions on how to manage timber stands once ‘the damage has been done,’ i.e., forest stands have undergone DLC (or many occurrences of DLC). Proper forest management is highly dependent upon the availability of acceptable growing stock (AGS) within the stand. Here AGS refers to trees meeting specified objectives of species, quality, vigor, and value. As outlined in *Treatments for Improving Degraded Hardwood Stands*

(Clatterbuck, 2006) [http://trace.tennessee.edu/utk\\_agexfores/26/](http://trace.tennessee.edu/utk_agexfores/26/), two options exist for degraded stands: rehabilitation or regeneration.

Where sufficient acceptable growing stock exists, stands can be *rehabilitated* (improved) via sanitation harvesting, crop tree release, or pre-commercial timber stand improvement. With these practices, undesirable trees are either harvested or deadened in an effort to create adequate growing space for the desirable (AGS) trees. If a market cannot be located for the undesirable trees, they can be deadened by girdling and/or with herbicide treatment. Cost-share assistance is sometimes available from both the state and federal governments to offset investments in deadening undesirable trees.

Alternatively, when the growing stock is so poor that stand continuation is not economically viable (a decision that should involve assessment by a professional forester), stand *regeneration* is the preferred option. Regeneration is the act of starting (or reproducing) a new forest, and can occur in a variety of ways which include clearcutting, patch openings (small clearcuts), shelterwood, or planting. With these techniques, new seedlings are released, invade, or are planted to occupy growing space, eventually becoming a viable stand. Southern hardwood forests are difficult to sustain with continuous partial harvesting. Doing so favors the reproduction of shade-tolerant species, generally viewed as less desirable. Regeneration of many of the more desired species (oaks, tulip poplar) requires that at some point, a heavier, stand initiating harvest is needed – thereby allowing adequate sunlight to reach the forest floor and encourage seedling development.

## Closing Remarks

Diameter limit cutting has been practiced for generations, is simple to implement, and can provide favorable short-term financial returns. However, DLC usually leaves a degraded forest. This runs counter to sustainable forestry. With DLC, trees with highest current value are harvested, leaving slow growing and/or poor quality trees behind. Stand growth, yield, and future timber sale incomes are compromised.

This article creates awareness of the problems of DLC with intent to reduce the implementation of this practice. Before a commercial timber harvest is conducted, landowners are advised to first seek assistance from a professional forester. With the forester’s knowledge, a plan can be developed that will not only avoid DLC, but reverse the deleterious effects. ♣

### References

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