Facilitating a Dialogue About Diameter-Limit Cutting

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Why a Conference About Diameter-limit Cutting?

Before embarking on an exploration of the specifics of diameter-limit cutting, we would be well served to ask ourselves, "Why is this topic important?" The answer to that question requires us to consider silviculture. Silviculture is "the art and science of controlling the establishment, growth, composition, health and quality of forests and woodlands to meet diverse needs and values on a sustainable basis" (Helms 1998). This definition highlights two critical features of silvicultural treatments: focus on residual stand condition and a long-term perspective.

Diameter-limit cutting means removing all merchantable trees larger than a specified diameter at breast height (Helms 1998). In practice, this usually involves the use of a fixed, or inflexible, diameter threshold, above which merchantable trees are harvested with retention of unmerchantable timber and without tending in the smaller size classes. Unlike silviculture, the focus of diameter-limit cutting is on what is removed, i.e. the largest and most valuable timber. A related practice is high grading, or removing the most commercially valuable trees from a stand. High grading is a more general term and encompasses diameter-limit cutting as commonly applied. Both practices are commodity driven: trees are selected for harvest based on an overriding interest in short-term revenue while bypassing the desirable features (focus on the residual and the long-term) of silviculture.

If the benefits of silviculture are acknowledged, why are commodity-driven harvests so common? An historical perspective provides some clues. Forestry, as a profession, became established in the Northeast in the late 1870s when the USDA Division of Forestry was formed, followed by state forestry commissions and forest societies in the 1880s and 1890s (Fernow 1913). Early reports of forestry practice, such as those by Austin Cary (1894) recounted the harvest of only the largest and best trees. In fact, diameter-limit cutting was recommended at the time as a means of preserving growing stock (Cary 1907, Murphy 1917). With no markets for anything but high-value trees, large trees were selectively removed under the guise of selection silviculture. See Pinchot (1905) or Westveld (1949) for examples.

Some foresters raised concerns about diameter-limit cutting as early as the 1900s. Murphy (1917) reported that diameter-limit cutting was common in the spruce regions, but warned that failure to improve the smaller size classes or retain thrifty trees of large sizes would prevent sufficient yield to make cuts periodically. Later research led Blum and Filip (1963) and Roach (1974) to question the sustainability of structure and growth in diameter-limit cut stands. Seymour et al. (1986) expressed concern about "short-sighted, financially motivated cutting," and encouraged wider application of silviculture. More recently, Kenefic et al. (2005) and Nyland (2005) concluded that repeated diameter-limit cutting reduced stand quality, value and long-term yields. Alternative silvicultural treatments were suggested (Kenefic and Nyland 2005).

Diameter-limit cutting is an integral part of our forest history in the Northeast, resulting in millions of acres of cutover lands. Many second-growth stands now contain poor quality stems, less valuable species, and variable stocking and crown cover as a result of past harvesting practices (Nyland 1992). At the dawn of the 21st century, Irland (1999) concluded that cutting in the Northeast generally was depleting stand quality and value far more than improving it.

Partial cuts focusing on extracting value continue to be widespread (Seymour 2005). Long-standing use of diameter-limit cutting has been little mitigated by findings from research about the benefits of silviculture. The short-term financial benefits of cutting only the

largest trees are compelling. This raises a number of questions: What historical factors shaped the widespread application of these cutting practices and discouraged silvicultural treatments? What are the long-term impacts of diameter-limit removals on the region's forests? What are the economic and genetic implications? What are the ethical obligations of foresters considering diameter-limit cutting? And, perhaps most important, can we effectively rehabilitate the cutover forests of our region?

The papers presented in this report reflect the content of a two-day conference for forestry practitioners, researchers, policy makers, and landowners at the University of Massachusetts on May 23-24, 2005. We hope that this presentation of the conference papers will help to sustain a dialogue about diameter-limit cutting in the Northeast and increase interest in opting for silviculture instead.

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