

LONG-TERM STAND DEVELOPMENT IN UNEVEN-AGED NORTHERN HARDWOODS UNDER SELECTION SYSTEM MANAGEMENT

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Uneven-aged silviculture has become more desirable for landowners interested in maintaining continuous forest cover while providing benefits such as timber production and wildlife habitat. Beginning in 1973, Ralph D. Nyland of SUNY-ESF established permanent plots in several uneven-aged northern hardwood stands undergoing partial cutting treatments at the Cuyler Hill State Forest in Cortland County, NY and at the Huntington Wildlife Forest in Hamilton County, NY. These plots were used to document changes in stand structure and patterns of regeneration.

The development of diameter distributions in uneven-aged stands indicates the likelihood of obtaining sustained yields over multiple entries. Diameters of tagged trees on permanent plots were collected prior to cutting and at 3 - 5 year intervals after treatment. The diameter distributions in stands receiving single-tree selection method cuts have retained the classic reverse-j shape, which is thought to resemble sustainable structures. However, other stands receiving partial cuts resembling diameter-limit cutting have developed an excess of pole-sized trees, with slower growth into the sawtimber classes.

These stands have also been used to evaluate the development of understory beech, which is a significant interfering plant to more desirable regeneration such as sugar maple. Bohn and Nyland (2003) evaluated the change in understory beech importance ten years after partial cutting. Species importance was assessed using an index value incorporating both abundance and heights of stems. We found that understory beech increased in importance on plots when initially established at moderate to high levels before cutting, and did not typically increase in importance where not previously established.

Currently, the stands are being used to evaluate changes in spatial variability of trees and the effects on volume production resulting from selection system and diameter-limit cutting practices. Stem maps in 2-acre areas in four stands were created to assess both point pattern of residual trees and plot-level variation in basal area. Preliminary results suggest that selection system silviculture results in a more uniform spacing of sawtimber-sized trees. Tending in pole and sapling classes during selection system management reduces localized competition but does not affect the overall spatial pattern of the stand.

Literature Cited

Bohn, K.K.; Nyland, R.D. 2003. **Forecasting development of understory American beech after partial cutting in uneven-aged northern hardwood stands.** *Forest Ecology and Management*. 180: 453-461.