IDENTIFICATION OF CANOPY STRATA IN ALLEGHENY HARDWOOD STANDS

David W. McGill[1], Stephen B. Jones[1], and Christopher A. Nowak[2]

Abstract: Allegheny hardwood stands typically develop vertical canopy layers, or strata, due to differential species-specific growth rates and tolerance to shade. Across the Allegheny Plateau, black cherry dominates the main canopy, while sugar maple, American beech, and red maple are relegated to subcanopy strata.

Stratification of Allegheny hardwoods is critical in forest management. For example, diameter-limit cutting of the larger and more valuable black cherry results in a residual stand that consists of sugar maple and beech, compromising the economic potential of the site. In addition, because these stands are stratified by species, where each stratum usually consists of not more than two species, the number and arrangement of the strata influence the diversity of and the regeneration potential in these stands.

This study compares several methods used to identify and characterize individual canopy strata, canopy profiles depicting tree silhouettes along horizontal transects, histograms showing the frequency of trees by diameter or height classes, and structural contour charts expressing the distribution of trees by both height and diameter classes. Structural contour charts represent a novel approach to depicting and evaluating canopy strata.

[1]School of Forest Resources, The Pennsylvania State University, University Park, PA 16802.

[2]USDA Forest Service, Northeastern Forest Experiment Station, Forestry Sciences Laboratory, P.O. Box 928, Warren, PA 16365.