

ASSESSING SPECIES VARIATION WITHIN FOREST COVER TYPES DELINEATED
USING COLOR-INFRARED AERIAL PHOTOGRAPHS

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Abstract: Color-infrared aerial photographs are widely used to aid in the classification and inventory of large forested tracts. Areas of similar photographic color and texture are delineated and a limited number of categories (or groups of areas with similar features) are identified. The forest cover type, and sometimes the average timber volume, of each group is then determined by "ground-truthing" randomly selected representative areas. This technique provides a quick, cost-effective method of forest cover typing and forest inventory across large landscapes. However, there is potential for significant variation in species composition within each classified group. This variation is often ignored; therefore, classifications made using this technique may be too general to be of much value in forest management.

The purpose of this study was to determine what degree of variability can be expected in Appalachian hardwood stands classified using the technique described. Color-infrared aerial photographs of the 3,100-ha West Virginia University Forest were scanned, allowing digital rendition of each photograph. Obvious landmarks on each photo were located in the field and the geographic location of each landmark was determined using a Trimble GeoExplorer GPS unit and base station. Arc/Info software was then used to create a computerized photo mosaic of the Forest. Major differences in tree cover, expressed as variations in color and texture, were identified through supervised classification. Contiguous areas of similar features (stands) were delineated and a small number of general groups were identified. The SAF forest cover type of each categorized group was determined through field inventory of randomly selected stands in each group. All of the stands in the three most prevalent categories were then intensively inventoried to ascertain variation in species composition within these categories. The outcome was an estimation of the range of ground conditions that appear on an aerial photograph as a single forest cover type. It is anticipated that the results of this study will aid in the refinement of this commonly used technique of delineating forest cover types across large landscapes.

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