

# GROWTH OF VOLUNTEER TREES ON PRE-SMCRA, UNRECLAIMED SURFACE MINED LANDS IN WEST VIRGINIA<sup>1</sup>

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**Abstract.** Surface mining in West Virginia has disturbed large tracts of forested land. In the 1930 to 1960s, reclamation generally involved replanting of trees on mined sites, but revegetation practices gradually evolved into seeding of forages for erosion control as federal and state laws were enacted in the 1970s. Reforestation of mined lands has recently become an important issue and both federal and state regulatory agencies are returning to forestry as a preferred post-mining land use. This study evaluated tree species recruitment and growth on three, pre-SMCRA, surface mined areas that were not transplanted with trees. Three transects of 150 m at each site extended across three positions: 1) the flat top after coal removal, 2) the outslope down from the flat top where soil and weathered rock materials had been pushed down the hill, and 3) the undisturbed forest. Tree canopy cover and herbaceous cover were determined at 1.5-m intervals along the transect line, and tree density and diameter at breast height were measured for each species located in a plot 2.3 m wide along the transect line. Soil samples were taken to a depth of 25 cm at 15-m intervals along transects. Soils in all positions generally had loam textures, and soil pH ranged from 4.6 to 6.0 on undisturbed and outslope positions to 6.1 to 6.6 on flat tops. Soils were noticeably thinner and denser on flat tops than in other positions. Undisturbed forests averaged 85% canopy cover and were dominated by tuliptree (*Liriodendron tulipifera* L.), red maple (*Acer rubrum* L.), and sugar maple (*Acer saccharum* Marsh.), with minor contributions from red oak (*Quercus rubrum* L.), black gum (*Nyssa sylvatica* Marsh.), sourwood (*Oxydendron arboretum* (L) DC), sassafras (*Sassafras variifolium* (Nutt. Nees), and hickory (*Carya spp.*). Outslopes had primarily red maple, black birch, tuliptree, sourwood, and black locust (*Robinia pseudo-acacia* L.). Flat areas were dominated by herbaceous cover with red maple and black locust being the dominant trees. Areas seeded with herbaceous plants showed low numbers and cover by trees, while areas not seeded with herbaceous plants were almost as heavily covered by trees as undisturbed areas. New guidelines are being developed to aid survival and growth of mid to late-successional trees on newly-reclaimed sites. These include less compaction of soil materials and seeding less aggressive forage species where trees will be planted.

**Additional Key Words:** forestry, mining, reclamation, succession

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