THE USE OF FIRE AND THINNING TO PROMOTE OAK REGENERATION ON PRIVATE PROPERTY IN THE SOUTHERN CUMBERLAND PLATEAU

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Abstract—Oak regeneration and recruitment of oak seedlings into the sapling stage is a major goal for many land managers in the Southeastern United States. Over the past 7 years and on three sites, we have attempted to restore forest stands that were partially planted in loblolly pine (Pinus taeda) and eastern white pine (P. strobus) in the 1960s back to oak dominated stands. The primary objectives of this work were to examine the effectiveness of thinning and fire in the restoration of the native hardwood component, particularly with regard to our primary oak species (Quercus alba, Q. montana, Q. velutina, Q. coccinea), to integrate undergraduate students into the management process (inventory, tree marking, prescribed fire), to create long-term research sites for student projects, and to create habitat diversity in a matrix of closed upland forest. After basal area reductions ranging from 21-60 percent and three fires, oak seedling densities increased from pre-treatment densities that ranged from 2000–9000 seedlings per ha to 8000–54 000 per ha two growing seasons after the third fire. After the third fire, mean litter depths ranged from 0.4 to 1.2 cm, with no statistical differences for litter and O Horizon depth among the three sites (> 0.15). Browse of oak seedlings has been light with Vaccinium spp., Smilax spp., Sassafras albidum and Nyssa sylvatica the preferred species. We noted that logging technology and the resulting slash distribution greatly influenced the intensity and spread of the first fire at each site.