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

C. Ken Smith, Ellie Fowler, Nate Wilson, Nicole Nunley, and Victoria Schnaufer

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 (*P-value* > 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.

Author information: C. Ken Smith, Professor, Ellie Fowler, Undergraduate Student, Department of Earth and Environmental Systems, The University of the South, Sewanee, TN, 37383; Nate Wilson, Forest Manager, Office of Environmental Stewardship and Sustainability, The University of the South, Sewanee, TN, 37383; Nicole Nunley, Field Coordinator and GIS Specialist, Department of Earth and Environmental Systems, The University of the South, Sewanee, TN, 37383; and Victoria Schnaufer, Undergraduate Student, Department of Earth and Environmental Systems, The University of the South, Sewanee, TN, 37383.

Citation for proceedings: Clark, Stacy L.; Schweitzer, Callie J., eds. 2019. Oak symposium: sustaining oak forests in the 21st century through science-based management. e-Gen. Tech. Rep. SRS-237. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 192 p.