

ASSESSMENT OF OAK DECLINE IN MISSOURI, ARKANSAS, AND OKLAHOMA

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Since 1999, widespread and locally severe oak decline and mortality have occurred throughout the Ozark Highlands of Missouri and Arkansas and the Ouachita Mountains of Arkansas and Oklahoma. Aerial reconnaissance indicates that over 400,000 acres throughout the region have been severely damaged. A unique contributing factor in the decline is an outbreak of the red oak borer (*Enaphalodes rufulus*) (Haldeman) (Coleoptera:Cerambycidae). Despite the magnitude of the decline, estimates of the problem that are based on field surveys have been lacking. In 2002 and 2003, approximately 250 field plots were established throughout Missouri, Arkansas, and Oklahoma to quantify the distribution and severity of oak decline. The project is a collaborative effort among the U.S. Forest Service North Central Research Station, the Southern Research Station, the University of Missouri, and the University of Arkansas-Monticello. Data were collected from overstory, understory, and regeneration plots in high risk and low risk forests. High risk areas were defined as having a high basal area of species in the red oak group, while low risk forests had a low basal area of red oak. Preliminary results indicate that red oak had the highest importance values on high risk plots while shortleaf pine (*Pinus echinata* L.) was the most important species on low risk plots. Fifty percent of red oak density and 53 percent of red oak basal area were dead/dying on high risk plots. In contrast, 20 percent of red oak density and 20 percent of red oak basal area were dead/dying on low risk plots. Red oak mortality was not related to tree size on either high risk or low risk plots. Sapling and seedling regeneration on high risk plots was dominated by shade tolerant species such as red maple (*Acer rubrum* L.), blackgum (*Nyssa sylvatica* Marsh.), and flowering dogwood (*Cornus florida* L.). In areas with high levels of mortality, decline-accelerated changes in species composition away from red oak-dominated forests appear to be occurring.

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