

ECOSYSTEM RESTORATION

Oak forests play a pivotal role in forest ecology and economics throughout the Central Hardwood Region. The sustainability of oak forests is threatened by widespread oak decline and regeneration failure. Oaks are mid-tolerant; moderate disturbance that alters forest floor light is required for seedlings to become dominant trees. Too much, or too little light allows more competitive tree species to replace oak. Oak regeneration failure is due to changes in disturbance regimes and resulting shifts in species composition. Regeneration problems are particularly pronounced on “high quality” sites having abundant moisture and nutrients. Differences in regeneration potential, competition, and site quality within and among physiographic regions make it difficult to develop general guidelines and techniques for oak ecosystem restoration.

The Upland Hardwood Ecology and Management RWU 4157 is working with many [collaborators and partners](#) to establish a new study (established 2008) that focuses on the ecosystem response to 3 recommended but not widely tested treatments that alter light and hardwood competition to enhance oak [regeneration](#), across a site quality gradient within and across 4 physiographic regions of the southern central hardwood region. We will examine the regeneration response of oak and other hardwood species, herbaceous plant diversity, and wildlife habitat features. In some locations we are also studying the response of bats, birds, small mammals, reptiles and amphibians to these oak regeneration treatments.

Complete study installations are located in [North Carolina](#), [Tennessee](#), [Arkansas](#), and [Missouri](#). Treatments are: (1) shelterwood, burn 3 years later; (2) midstory removal with herbicide, harvest after 11 years; (3) prescribed [fire](#) every 4 years, harvest after 11 years.

Results will allow us to develop guidelines for sustainable oak ecosystem restoration and management within the southern Central Hardwood Region, and help ensure that these forests continue to provide valuable economic and ecological services.

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