

Prescribing fire in eastern oak forests: is time running out?



Marc Abrams. *Northern Journal Applied Forestry* 22(3): 190-196. 2005

MANAGEMENT IMPLICATIONS

- Due to fire suppression many eastern oak ecosystems are becoming less flammable, less diverse, and less resilient habitats for people and wildlife
- The window for restoration management with prescribed fire may be closing due to the increasing dominance of mixed-mesophytic species in eastern deciduous forests
- Human ignitions were critical to the existence of historically frequent fire regimes and perpetuation of oak in eastern deciduous forests

Marc Abrams describes eastern U.S. oak forests as having undergone dramatic changes in structure and composition due to severe changes in disturbance regimes following European settlement. Citing studies which utilize lake and bog sediment cores, fire scars, and witness tree descriptions from early land surveys, Abrams reports that many eastern U.S. forests have changed from a pre-European settlement fire-dependent oak (*Quercus*) forest type to a mixed-mesophytic fire-excluding forest type.

Abrams suggests that the oak forests that settlers and early land surveyors encountered in the eastern U.S. were largely the product of American Indian burning practices. Later successional mixed-mesophytic species, such as red maple, sugar

maple, birch, beech, and black gum, were held at bay by periodic understory burning and restricted to fire-sheltered moist alcoves. Forest disturbances brought on by European settlement including extensive selective logging and associated devastating wildfires, chestnut blight, and subsequent fire suppression have allowed mixed-mesophytic species to advance and will eventually dominate the landscape (excluding the more xeric southwest corner of the eastern deciduous forest). The foliage of these species contain much less lignin than oak leaves and quickly decompose, rendering a much less flammable environment. Adding to these disturbance shifts is high deer population with intensive browsing that suppresses oak recruitment even more, thus further reducing flammable

oak leaf litter. Changes in forest composition and structure have resulted in a feedback loop creating a landscape that is less and less likely to carry fire. Abrams notes that this is in stark contrast to fire suppression effects in dry coniferous western U.S. forests where stand density and species composition changes have resulted in more fire-prone forests. Abrams warns that land managers in the eastern U.S. wanting to utilize prescribed burning as a restoration tool are facing a closing window of opportunity (Nowacki and Abrams 2008).



Photo by Neal Humke, L-A-D Foundation

Although restoration efforts are under way across eastern oak forests like the one pictured here at a rhyolite glade in Shannon County, Missouri, decades of fire suppression create a challenging environment for prescribed fire due to the increasing dominance of shade tolerant, mesophytic tree species.

FOR FURTHER READING

Nowacki, G. and M. Abrams. 2008. [The Demise of Fire and "Mesophication" of Forests in the Eastern United States. *BioScience*. 58\(2\):123-138.](#)