

## **Ecological Effects of Fire on *Xerophyllum asphodeloides*, a Rare Appalachian Lily**

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Fire's role as a biotic disturbance agent in Appalachian forests has been historically understudied. We performed a fire/canopy removal field experiment to determine the impact of these factors on survival and reproduction of turkeybeard (*Xerophyllum asphodeloides*), a rare lily associated with Appalachian mixed pine-oak forests. Turkeybeard is endangered or rare in portions of its range and is in the U.S. Center for Plant Conservation's National Endangered Plant Collection. It is also thought to be fire-dependent; yet, there has been no experimentally validated ecological linkage to fire. An immense flowering response to our treatments occurred in the second and third post-manipulation years. Mixed-model ANCOVA analyses yielded a significant positive effect of fire on both the numbers of fertilized flowers and seeds. A significant positive effect of canopy removal on these variables was also found. Total number of flowers per inflorescence did not differ between control and treated plants. Inflorescences from another nearby undisturbed, shaded population showed virtually no fertilization or seed production. Many plants exhibited a cost of reproduction by partial vegetative dieback, but little complete mortality occurred. This suggests that fire is important for turkeybeard conservation, and also has implications for the study of disturbance regimes in Appalachian forests.

## **A Shelterwood-burn Technique for Regenerating Productive Upland Oak Sites**

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Regenerating oak stands on productive upland sites is widely recognized by foresters as a major problem in hardwood management. Recent research indicates that oak regeneration is a more resilient sprouter following surface fires than its primary competitors on these sites if burning occurs 3 to 5 years after a partial overstory harvest. This combination of cutting followed by fire (the shelterwood - burn technique) mimics natural disturbances that have occurred in eastern North America for millennia and appears to be a viable approach to regenerating oaks on productive upland sites. This poster presents silvicultural guidelines for applying the shelterwood - burn technique on appropriate sites and discusses its benefits for private landowners and resource professionals.