

THE EFFECTS OF TIMBER HARVESTING AND PRESCRIBED FIRE ON INVASIVE PLANT DYNAMICS IN THE CENTRAL APPALACHIANS

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Abstract

Land managers throughout the central Appalachian region are using prescribed fire to restore table mountain pine (*Pinus pungens* Lamb.), pitch pine (*Pinus rigida* Mill.), and oak (*Quercus* spp. L.) forest communities. However, there is little knowledge of the relationship between prescribed fire and forest invasion by exotic plants. The objective of our study is to examine the relationships between prescribed fire and the abundance of exotic, invasive plants on three similar mountains representing a chronosequence of time since burning. Our sites are located in the Dry River Ranger District of the George Washington National Forest, WV. The mountains were burned at different times: Brushy Knob (BK) treated in 1992, Heavener Mountain (HM) treated in 2003, and Dunkle Knob (DK) treated in 2004. In addition, timber harvesting occurred at scattered locations on all the mountains during the 1970s and early 1980s. Each mountain was stratified by northeast and southwest aspects and lower and upper elevations for vegetation sampling beginning in 2003. Initial (2003) vegetation inventories of DK (pre-burn), BK and HM (post-burn) as well as personal observations indicate that exotic invasive plants such as *Ailanthus*

altissima (Mill.) Swingle) and garlic mustard (*Alliaria petiolata* (M. Bieb.) Cavara & Grande) were primarily restricted to areas where logging occurred (i.e. coves and lower slopes) and other disturbed areas such as firelines.

Following prescribed fire on DK (2004), mean percent cover of garlic mustard remained unchanged, possibly due to the fire missing a couple of plots where this species was inventoried in 2003. *Ailanthus* seedlings were inventoried in three out of the four sections, but only one (the northeast upper elevation section) showed a significant increase. However, field observations indicate that *Ailanthus* seedlings were not just restricted to burned areas on DK, hence the sampling design did not capture the true abundance of the propagules of this exotic tree. Field observations in 2004 also suggest an increase in number of *ailanthus* seedlings on HM, but not on BK. The preliminary results of this study support the need for monitoring problematic non-native species in prescribed burning programs. Additional research is also needed to test and improve sampling methods for documenting exotic invasive plant dynamics in response to fire and other disturbances.