

UNDERSTORY RESPONSE TO DISTURBANCE: AN INVESTIGATION OF PRESCRIBED BURNING AND UNDERSTORY THINNING TREATMENTS

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ABSTRACT.—Lack of disturbance in the Central Hardwood Region has caused a decrease in abundance of shade-intolerant species, such as oaks (*Quercus* spp.) and hickories (*Carya* spp.), in the forest understory, while shade-tolerant species have proliferated. The goal of this research is to determine how two disturbances, prescribed fire and mechanical understory removal, affect woody species regeneration, as well as herbaceous species diversity. A randomized complete block design was developed to test the effect of prescribed burning, mechanical removal of understory shrubs and trees, the combination of burning and removal, and no treatment. Preliminary analysis indicates that all treatments have little effect on herbaceous species diversity; however, prescribed burning affected the composition of woody species seedlings. While fire top-killed most seedlings, regardless of shade tolerance, shade-intolerant species responded by resprouting. Combined with a reduction in the number of shade-tolerant species, burning produced greater equitability among tolerant and intolerant species seedlings. Removal treatments had no effect on the number of seedlings, but increased the level of photosynthetically active radiation (PAR) reaching the forest floor, which is essential for the growth of shade-intolerant species. The combination treatment provides both greater equitability among species, and higher levels of PAR. Further data collection and analysis are necessary to determine if growth and equitability are sustained over time.

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Citation to proceedings: Van Sambeek, J.W.; Dawson, J.O.; Ponder, F., Jr.; Loewenstein, E.F.; Fralish, J.S., eds. 2003. Proceedings, 13th Central Hardwood Forest conference; 2002 April 1-3; Urbana, IL. Gen. Tech. Rep. NC-234. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 565 p. [Abstract from poster presentation].