MANAGING COMPOSITION OF PIEDMONT FORESTS WITH PRESCRIBED FIRE

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Poster Summary

Native Americans used frequent burning of forests in the South's Piedmont to maintain pine-dominated stands, to favor oak regeneration over other hardwoods, and to keep understories open. From 1950 to 1990, fire occurred rarely in the region, resulting in a gradual replacement of pines with hardwoods. More recently, however, prescribed burning has been used much more extensively to restore open pine stands for key species such as the red-cockaded woodpecker (Picoides borealis). Burning maintains open pine forests and also reduces fuel-loading and the likelihood of damaging wildfires.

The silvicultural effects of burning at different frequencies and in different seasons, especially in stands that have a significant hardwood component and very little herbaceous understory, are less well understood. To determine the effect of prescribed burning regime on overstory and understory composition, in 1987 we established a series of plots on the Hitchiti Experimental Forest in central Georgia.

The study was within a representative stand of naturally regenerated loblolly pine (Pinus taeda L.) aged 80 years or older. Our randomized block design was based on initial overstory basal area, and we looked at six different treatments: dormant season burns every 2 years with headfires, dormant season burns every 3 years with headfires, dormant season burns every 3 years with backfires, growing season burns every 3 years with headfires, growing season burns every 6 years with headfires, and an unburned control. Each plot was about 2 acres, and there were four replications of each treatment.

Prior to treatment, plots were dominated by loblolly pine with a significant midstory of hardwoods. Since treatment, control plots have changed very little, although there has been some natural thinning of saplings. None of the treatments has reduced midstory hardwoods, although it appears the 2-year dormant burns are keeping them in check. The growing season burns have reduced the density of hardwood saplings and increased the density of seedlings. Saplings have been nearly eliminated by dormant season prescribed burns on a 2-year cycle. The density of small shrub stems, however, was greatly increased by dormant season burns. Herbaceous cover decreases in the season immediately following burning but then quickly recovers. The dormant season headfires have been most successful in increasing herbaceous cover.

It is apparent that even infrequent burns greatly reduce the understory hardwood component, thereby curtailing succession and maintaining an open, pine-dominated stand. However, none of the treatments we studied was successful in reducing midstory hardwoods, and this suggests that mechanical or chemical treatments may be necessary to restore or maintain stands used by red-cockaded woodpecker. An herbaceous-dominated ground cover did result from the frequent dormant season headfires even where there were significant midstory hardwoods. Therefore, managers who want some midstory and overstory hardwoods for wildlife and aesthetic reasons can maintain these while still providing significant woody browe and herbaceous species in the understory. Without fire, the hardwood stems will increase in all layers, just as they did in the unburned controls. Thus, the choice of allowing conversion to mostly hardwoods, maintaining pines and hardwoods, or fostering mostly pines becomes a management decision, because all these forest types can be maintained in a dynamic stable state using appropriate silvicultural practices.

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