

IMPACTS OF REPEATED PRESCRIBED FIRES ON FUELS IN A CENTRAL APPALACHIAN HARDWOOD FOREST

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Throughout the central hardwood forest region, managers are increasingly using fire to attain various management objectives, including the promotion of oak regeneration, forest thinning, and fuel reduction. In the Daniel Boone National Forest in Kentucky, managers have used fire as a management tool in upland oak forests for more than 10 years. Funding for prescribed burning often comes with the justification that burning will reduce fuels and help prevent future unplanned fires. We examined fuel changes following one and two prescribed fires in spring. Fuel mass was sampled before the introduction of fire, after a single prescribed fire, after leaffall following one fire, and after two prescribed fires. Concerns about the potential for increased soil erosion following repeated fire prompted sampling of mineral soil exposure after the second prescribed fire. This study demonstrated that one and two prescribed fires decreased leaf litter, which was replaced in mass but not fuel continuity during leaffall. A single prescribed fire significantly decreased 10-h woody fuels, which were replenished the next leaffall in concurrence with leaf litter. Repeated prescribed fire significantly increased 1-h woody fuels. The duff layer decreased on burned treatments following a single fire, and decreased further after a second fire. After one burn, duff depth decreased more on subxeric landscape positions than on submesic positions. Mineral soil exposure also increased with number of fires. It was highest on subxeric and intermediate plots after one burn and higher on submesic plots after two burns. Subxeric plots showed a strong correlation between mineral soil exposure and litter consumed. Fuel consumption, duff depth, and mineral soil exposure varied with landscape position. On sites with steep slopes, repeated fire could lead to increased erosion due to exposed mineral soil. Common encounters with turkeys and their scratching has stimulated questions about their possible affinity for recently burned areas as a contributing cause for increased soil exposure.

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