

Vegetation recovery in slash pile scars following restoration of an Ozark woodland

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Abstract

Restoration practices often include the use of slash pile burns as a method of removing excess woody debris. In the restoration of an Ozark woodland, slash pile burns were used to eliminate woody debris produced by honeysuckle removal and tree thinning. Slash pile burns create an area of localized disturbance with altered microenvironmental conditions that can delay vegetation recovery. In order to gain insight into the microenvironment of these slash pile burn scars and whether they pose a barrier to native vegetation recovery, a field experiment and lab experiment were conducted with six native woodland herbaceous species. These experiments were used to determine which native species are best able to colonize burn scars and to distinguish the relative role biotic and abiotic changes play in altering the microenvironment of the burn scar. In the first growing season, soil nutrients and pH increased while soil organic matter and soil compaction decreased in burn scars compared to controls. Soil moisture varied more and declined across the growing season in burn pile scars compared to the controls. In general, native species tended to establish better in unburned control areas, and only one species showed enhanced germination in burn pile scars. In a greenhouse study, a majority of species exhibited greater biomass gain in control soil compared to burn pile scar soil. Further, half of the species exhibited greater biomass in nonsterilized soil compared to sterilized soil, suggesting positive soil-feedbacks are important in the restoration of native species in degraded woodlands. Our results suggest that, despite lower overall establishment rates in burn pile scars, native species can establish in them the first growing season. When restoring vegetation to burn pile scars, native woodland grasses have an advantage over composites and legumes due to their higher establishment rates in the field and their seeds require less pretreatment.