

EFFECTS OF FOREST MANAGEMENT ON SOIL SEEDBANK SPECIES COMPOSITION IN A MIXED-OAK FOREST IN SOUTHEASTERN OHIO

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Burning and thinning are common management practices in mixed-oak forests. The impacts of these practices on the soil seedbank have not been examined. This information is important to consider to evaluate the full impact of these treatments on plant community dynamics in the understory. Species composition of the soil seedbank was examined under four forest management treatments: thin, burn, thin followed by burning, and an untreated control. Sampling areas were located in Vinton County, Ohio, at Zaleski State Forest and the Raccoon Ecological Management Area. Both sites are part of the USDA's Fire and Fire Surrogate study. Thinning was conducted in the fall of 2000 and burns were conducted in the spring of 2001. Soil samples were collected in March 2004, 3 years following treatment. Samples were placed in the greenhouse and the emergence method was used to assess the species composition of seeds present in the soil. Seventy-one species were found in the soil seedbank. Ruderal and early successional species such as fireweed (*Erechtites hieraciifolia* (L.) Raf.), sedges (*Carex* spp.), and brambles (*Rubus* spp.) were the most commonly occurring species across all treatments. Multivariate analysis techniques revealed no grouping by stand management treatment. Log-linear analysis showed a treatment by functional group effect which, while not statistically significant ($P = 0.0872$), suggests possible biological significance. In different treatments there were different proportions of the various functional groups (grasses, perennial herbs, etc.). There seems to be no detectable difference in the species composition of the soil seedbank after short-term exposure to different forest management treatments, probably because the species that maintain a seedbank in the soil tend to be early successional. These species are not particularly sensitive to disturbance, but usually respond positively to disturbance. More disturbance-sensitive forest herb species tend not to maintain a soil seedbank, and thus did not register a response in this study. Studies examining above-ground species dynamics likely are sufficient to assess the impact of forest management on understory dynamics.

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