

BROCKWAY, DALE G.¹, KENNETH W OUTCALT² and BECKY L. ESTES¹, ¹USDA Forest Service, Auburn, AL; ²USDA Forest Service, Athens, GA. Restoring southern pine forest ecosystems: Plant community response to mechanical midstory reduction and prescribed fire on sandhills at Fort Benning, Georgia.

Developed during periods of fire exclusion, dense midstory vegetation, that reduces understory plant diversity (competitive shading) and increases the risk of damaging Wildfire (fuel ladder from ground to canopy), has impeded restoration efforts to safely reintroduce prescribed burning in southern pine ecosystems. Our study evaluated the effects of midstory reduction on plant community structure, composition and diversity in forests treated by mechanical means alone and also when followed by prescribed fire during the winter, spring or summer. Mechanical treatment caused declines in overstory and midstory tree density (1220 to 258/ha) and basal area (31 to 18 m²/ha) and a corresponding increases in mean DBH (13 to 29 cm), with the largest reductions in *Pinus taeda*, *Liquidambar styraciflua*, *Quercus nigra* and *Q. hemisphaerica*. Despite declines in tree species richness (9 to 4) and diversity (1.32 to 0.84), increased evenness (0.72 to 0.85) indicated improved distribution equity among residuals. Understory tree cover declined 17% overall and cover increases of 9% were observed for shrubs & vines (*Smilax* and *Vitis* expansion) and grasses (*Chasmanthium* appearance). Forb cover increases were very modest, averaging < 4%. Understory plant diversity remained generally unchanged following treatment, with increases noted for species richness corresponding to declines in evenness. While not producing large initial growth increases in herbaceous plants, prescribed fire is needed following mechanical treatment to stimulate grasses and forbs and curtail redevelopment of the woody plant midstory.