

EVALUATING 15 YEARS OF EXPERIMENTAL MANAGEMENT TREATMENTS IN SOUTHERN APPALACHIAN FORESTS OF NORTH CAROLINA

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Forests of Southern Appalachia have experienced the widespread loss of oaks, which are increasingly replaced by other species. To understand if management actions could halt or reverse this change (among other problems), a group of researchers and land managers installed a site replication of the Fire and Fire Surrogate Study at the Green River Game Lands (GRGL) in western North Carolina in 2001. The GRGL study implemented three experimental treatments replicated across three spatial blocks: mechanical felling of small stems, particularly the ericaceous understory (mech), prescribed fire (fire), a combination (mech + fire), and untreated controls (control). We evaluated forest attributes after 15 years of continually applied treatments. We found that basal area increased in control and mech, was unchanged in fire, and decreased in mech + fire. Decreases in basal area in mech + fire were driven by overstory tree mortality, which was correlated with loss of duff depth. Saplings were most abundant in mech + fire and were dominated by maples and oaks. Comparing the two, oak saplings were more abundant in plots where basal area decreased, though maple saplings were unaffected by changes to basal area. Taken together, these results indicate that mech + fire may be the best strategy of those tested to facilitate oak dominance in the sapling layer, but creating those conditions likely requires the mortality of overstory trees, including oaks.

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