

CAUSES OF A SEEDLING RECRUITMENT ADVANTAGE FOR AN ENCROACHING OAK OVER A HISTORICALLY DOMINANT OAK IN A FIRE-RESTORED OPEN OAK WOODLAND

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The lack of natural oak regeneration within forests is one of the most pressing conservation issues facing oak-dominated ecosystems in eastern North America. Although the restoration of suitable fire regimes appears to favor oaks over fire-sensitive mesophytes in many cases, differences in the effects of fire restoration on different species of oak have not received nearly as much attention. In particular, greater sapling recruitment of historically lowland *Quercus alba* compared to that of the historically upland and dominant *Q. stellata* in response to fire restoration may be related to differences in seedling establishment. We investigated species differences in seedling emergence, survival, and vigor over two growing seasons (fall 2020 to fall 2022) in a restored oak woodland in northern Mississippi. Seedling survival and vigor were greater in *Q. alba* than in *Q. stellata*. Both species had significantly lower performance in patches dominated by the invasive *Microstegium vimineum* than in those dominated by native species. Neighboring vegetation and litter removal significantly increased seedling survival in both species, but its effect was no greater in patches dominated by *M. vimineum* than in those dominated by native species, a result consistent with the existence of legacy effects of *M. vimineum*. Altogether, our findings suggest that higher seedling establishment in *Q. alba* than in *Q. stellata* may contribute to the lower regeneration rates of the historically dominant *Q. stellata* compared to encroaching *Q. alba* in fire-maintained woodlands. Negative effects of an invasive grass, *M. vimineum*, may further complicate restoration efforts.

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