

ESTABLISHMENT OF OAKS AFTER WILDFIRE DEPENDS ON FIRE INTENSITY

Jennifer Franklin and Matthew Aldrovandi

There is abundant evidence that fire is important in the maintenance of oak species in hardwood forests of the Eastern United States, and prescribed fire is commonly used as a tool to promote oak regeneration. Many of the oak species that occur in the region have traits that are characteristic of fire-adapted species, such as thick bark and the ability to produce sprouts from the root collar. Although the effects of fire on oak establishment have been studied for decades, research findings are often contradictory, likely due the wide range of variables involved. We measured oak establishment in the Great Smoky Mountains National Park in 2018, approximately 20 months after a wildfire, and again in 2022. Ten plots covered a range of fire severity from very low to very high, and these were compared to eight unburned controls in nearby areas. The majority of oaks present were northern red oak (*Quercus rubra*), chestnut oak (*Q. prinus*), and black oak (*Q. velutina*). Establishment in the areas burned at a low or moderate severity was primarily from seed, though oaks established from both seed and sprouts in severely burned areas. In 2022, oak density and recruitment into the 1-m height class was greater in all burned areas than in unburned control plots. Thus at lower fire severities oaks are likely to suffer minimal injury and act as seed sources in the following years, and their ability to produce fast growing sprouts upon the death of the main stem is beneficial in establishment after severe fires.