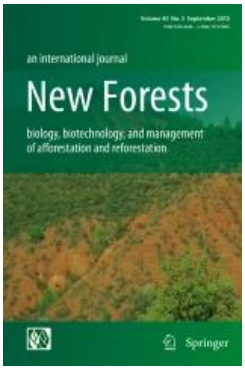
Climate and local factors influence Eucalyptus globulus establishment after off-season fires



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Abstract

Eucalyptus globulus Labill. is one of the most widely planted hardwood species worldwide. This species occupies a quarter of the country's forested area in Portugal, so there is a growing concern about its post-fire dispersal. Although it is generally recognised that fire promotes E. globulus natural regeneration and that precipitation and topography influence recruitment, little is known about the role of post-fire conditions on the establishment of the species following off-season fires. We examine how post-fire conditions affect E. globulus natural regeneration and invasive potential. Sapling establishment was assessed in plantations and under old and large isolated eucalyptus trees (seed-trees) following two off-season fire events (2017 June and October fires). Abiotic and biotic local factors affected differently sapling establishment in plantations and under seed-trees. In plantations, sapling cover was more influenced by tree-related traits (age and height), whereas the conditions beneath seed-trees mitigated the impact of harsh conditions on saplings. In both cases, post-fire climatic conditions constrained natural regeneration, with less impact under seed-trees, reinforcing their importance in establishment success. Thus, isolated seed-trees should be considered while managing the species' unplanned spread.