



Abstract

Is Native Forest an Alternative to Prevent Wildfire in the WUI in Central Portugal? [†]

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The expansion of the 2017 megafires in Portugal was observed to be locally halted by native broadleaf forest patches. Here, we present spatial simulation scenarios of fire behavior to assess whether native broadleaf forest cover mitigates fire spread during extreme wildfire conditions in wildland–urban interface (WUI) areas around industrial zones (IZs).

Our particular objective was to ascertain whether these forests could be an alternative land use in the 100 m management buffer around industries (mandatory management buffer, as per Portuguese Decree Law n° 82/2021). To this end, we combined a series of fire-behavior variables and used real-world data from the 2017 fires [1] to try to reproduce, through spatial modelling, those same fires in the broadleaved forest Mata da Margarça and in the IZs: Oliveira do Hospital, Mira, and Tocha, located in the center of Portugal. Subsequently, we adopted the same fuel model and canopy cover (81–100%) from Mata da Margarça to create alternative fire-behavior scenarios in 100 m and 500 m management ranges around IZs. Thus, we were able to assess whether a hypothetical conversion to native forest that has greater canopy cover would prevent fire from propagating into the IZs. All simulations were carried out within a 5 km buffer from the IZs to capture fire dynamics.

Our results suggest that broadleaved forest cover can reduce fire line intensity and rate of spread around IZs up to 20 and 8 times, respectively, on average. This reduction is more drastic as the surrounding area covered by broadleaves increases from 100 m to 500 m. Our results support the need to discuss forest management in Portugal to efficiently prevent intense fires in the WUI, encouraging the restoration of native forests and wider green fuel breaks.

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