

Assessment of environment, land management, and spatial variables on recent changes in Montado land cover in southern Portugal

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Abstract:

Montado decline has been reported since the end of the nineteenth century in southern Portugal and increased markedly during the 1980s. Consensual reports in the literature suggest that this decline is due to a number of factors, such as environmental constraints, forest diseases, inappropriate management, and socioeconomic issues. An assessment on the pattern of montado distribution was conducted to reveal how the extent of land management, environmental variables, and spatial factors contributed to montado area loss in southern Portugal from 1990 to 2006. A total of 14 independent variables, presumably related to montado loss, were grouped into three sets: environmental variables, land management variables, and spatial variables. From 1990 to 2006, approximately 90,054 ha disappeared in the *montado area* with an estimated annual regression rate of 0.14 % year⁻¹. Variation partitioning showed that the land management model accounted for the highest percentage of explained variance (51.8 %), followed by spatial factors (44.6 %) and environmental factors (35.5 %). These results indicate that most variance in the large-scale distribution of recent montado loss is due to land management, either alone or in combination with environmental and spatial factors. The full GAM model showed that different livestock grazing is one of the most important variables affecting montado loss. This suggests that optimum carrying capacity should decrease to 0.18–0.60 LU ha⁻¹ for livestock grazing in montado under current ecological conditions in southern Portugal. This study also showed that land abandonment, wildfire, and agricultural practices (to promote pastures, crops or fallow lands) were three significant variables influencing montado loss.

Keywords

Landscape change; Livestock grazing intensity; Montado/dehesa; Mediterranean ;*Quercus* spp.; Spatial distribution

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