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I International Conference on Research for Sustainable Development in Mountain Regions

Book of Abstracts

INSTITUTO POLITÉCNICO DE BRAGANÇA
Centro de Investigação de Montanha
Embrapa
United Nations Educational, Scientific and Cultural Organization · UNESCO Chair in Sustainable Mountain Development
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ADVID Cluster dos Vinhos da Região do Douro Douro Region Wine Cluster

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Assessment of fire hazard regulation ecosystem service in a mountain area in northeastern Portugal

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The fire hazard regulation ecosystem service (ES) is the capacity of ecosystems and landscapes to maintain the frequency and intensity of fire events. Assessing how ecosystems and landscapes regulate fire hazard is of utmost importance to avoid or mitigate negative environmental and socioeconomic impacts as well as to understand the benefits that human societies can obtain and their value. This study aimed to understand how landscape change affects fire behavior at the landscape level and to understand how these changes in fire impact human communities, i.e., what is the role of the landscape structure in the provision of the fire hazard regulation ES and what is the value of this service. This allows the identification of trends in present landscapes that can be used in future planning and management. The study was conducted in the Sabor River's upper basin in northeastern Portugal. The assessment was based on fire behavior modeling in the study area under five landscape scenarios (1990, 2006 and three future alternative landscapes). Modeling was conducted with BFOLDS (Fire Regime Model, v2.0). Simulations ran under extreme weather conditions, from thirty ignition points randomly located. The valuation assessment was based in the potential effects of fire on timber, firewood and mushrooms production, based on the relationship between average burned area and the economic value of ES. Between 1990 and 2006 the simulated average burned area increased while the average fire intensity decreased over time. Regarding the three alternative scenarios, the forest expansion scenario showed, on average, larger and more intense fires when compared with the rural abandonment and the shrubland expansion scenarios, as well as with previous dates. The potential losses in ES in monetary units followed the trends observed for fire behavior. In spite of this, the forest expansion scenario shows the highest supply and value of ES.

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