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Abstract

In a climate change scenario, the climatic dynamics in the study area is favouring the forest expansion due to the gradual increase of temperatures and overall to the maintenance of precipitation. However, there are some important nuances, the significant decrease in precipitation in the form of snow and a shorter duration of the cold season. The aim of our research is to analyse the development and the historical background of the natural deciduous forests to set measures for their sustainable conservation. These forests were intensively exploited since ancestral times. Now, socioeconomic globalization has brought about strong changes in rural areas. The decrease in open spaces due to rural depopulation has led to a natural expansion of forests and has affected the environment, biodiversity, and landscape. The landscape homogenization means diminution of open habitats (crops, grasslands, and scrublands), difficulty in the maintenance of agropastoral activities, and increasing risk of wildfires due to decrease in fragmentation. As well, from the biological viewpoint, an increase in forest species and core habitat specialists is expected to the detriment of open-habitat and ecotone species. Some authors have made known generalized losses in habitat suitability compared to current conditions in all kinds of deciduous forests in Spain, although with certain exceptions as: i) forests of Fagus sylvatica L. (likelihood 25%-50%) and Quercus robur L. (likelihood 75%-100%) in the Oro-Cantabrian biogeographic subprovince; ii) Quercus petraea (Matt.) Liebl. formations in the Cantabrian Atlantic subprovince (likelihood 25%-50%). Betula celtiberica Rothm. & Vasc. would suffer the largest losses of habitat suitability under all climate change scenarios. The vulnerability analysis carried out have confirmed the deciduous formations least affected by climate change in the future will be the Oro-Cantabrian forests, while the Pyrenean and Oro-Iberian communities are the most vulnerable. The sustainability of our forests within the study area mainly depends on the maintenance of traditional activities: extensive agropastoral exploitation and forest rational management. Extensive grazing, allowing a suitable number of livestock and avoiding their concentration in small areas, prevents soil erosion and vegetation impoverishment, increases mosaic diversity, and maintains open-habitat patches. Selective cutting appears to be an environmentally integrated and viable economic activity that reduces wildfires by promoting landscape fragmentation. To guarantee the sustainability of these activities, measures such as clear cutting and prescribed burning to create open habitats, improvement of forest access, increment of public awareness about mountainous areas, and agri-environmental measures need to be adopted.