

Effectiveness of the dehesa system to prevent and fight against wildfires

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Abstract

The Spanish region of Extremadura has suffered at least four remarkable wildfires in summer 2022 and spring 2023. They have drawn the attention of the most important national media and have also generated currents of opinion on how to manage its environment. In this line, we have discussed the role of the largest land system in the region (dehesa) as tool to prevent and fight against wildfires. To do that, firstly, we have checked official statistics (GWIS) to estimate the percentage of wildfires happened in dehesas. And we confirmed that the class in which dehesa can be included (grass/shrubs) reached its maximum in 2013 with 34.3% of the total number of wildfires. Nonetheless, this value is usually less than 10%, shrublands are not exactly dehesas and the number of wildfires does not necessary mean important fires. Secondly, we have estimated the average volume of watering ponds that dehesa farms use to have to store surface water in summer for livestock drinking. For doing that, we have assessed the volume of water of representative watering ponds by using drones (equipped with LIDAR) and GNSS systems that generated accurate 3D models. We found a significant equation between the surface covered by water (observable from aerial images) and their total volume (accurately estimated by us): $y = 0.0009x^2 + 0.1219x - 13.186$; $r^2 = 0.9985$, where x is water surface expressed in m^2 and y is water volume expressed in m^3 . We conclude that dehesa system is an excellent tool for fire prevention since its statistics of burned area is still quite low. In addition, we suggest that livestock should be introduced in the public forests of Extremadura (183,000 ha of land surface) to create similar land systems. Regarding water storing, the average volume of watering ponds in dehesas is about 100 m^3 per pond. It could mean enough water and good visibility for helicopters that take about 1 m^3 in each action.

Keywords: livestock, watering ponds, water volume, land management, Extremadura

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