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Decision Support System for Effective Fuel Management

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Abstract

Fuel management is currently a hot topic to overcome the large fuel loads that are present in Portuguese rural areas. Fuel management planning is complex as it must consider several socioecological needs and priorities within the area of interest, as well as limitations to perform the necessary actions. In this sense, Decision Support Systems (DSSs) may be useful tools to implement fuel management over large areas. Fuel Management DSSs are not as developed as Wildfire DSSs, since they are usually incorporated as a module of the Wildfire DSSs (Mavsar et al., 2013; Pacheco et al., 2015; Sakellariou et al., 2017). The most developed and sound Fuel Management DSSs is the 2017 North-American web-based application "Interagency Fuels Treatment Decision Support System – IFTDSS" (Drury et al., 2016; Wheeler et al., 2010). However, to our knowledge, there is no comprehensive Fuel Management DSS developed for Europe. The DSS for fuel management here proposed (PREVAIL DSS-FM), addresses research gaps found within the project PREVAIL, and it is intended to be a roadmap to help forest and fire managers by providing a clear and easy-to-apply methodology for planning fuel management activities in a particular area of interest. The area of interest is analysed as a holistic system where existing planning, management and stakeholders' perspectives are considered and integrated with landscape needs. The methodology defined is suitable for all territories and conditions and is based on a set of rules and dependent on stakeholder engagement. It is structured into three fundamental and sequential stages and inherent questions, as follows: (1) the need for fuel management: is there a need for fuel management? (2) the diagnostic for fuel management: where to treat? and (3) the actions for fuel management: how and when to treat? The roadmap of the PREVAIL DSS-FM was tested for an area within the Municipality of Cascais, Portugal, through a focus group carried out with the relevant stakeholders of the Municipality. Results showed that thorough socioeconomic analyses should be performed within the preparation steps. It was also pinpointed the need to identify who will intervene in the territory to ensure that fuel management is carried out by entities that will be able to maintain periodic interventions. Finally, stakeholder's selection should be strengthened by including population from the settlements within the area of interest into the discussions, in order to achieve a better integration and acceptability of the planned actions.

Keywords: PREVAIL project; DSS; Fuel management

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