Quantifying the effectiveness of fuel management in modifying wildfire behaviour – recent examples from Western Australia and Victoria

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Abstract

Prescribed fire has been used extensively for fuel hazard management in the eucalypt forests of southern Australia since the 1960s. Implementation of prescribed fire programs has been closely linked with, and dependent upon, the development of burning guides for particular forest types through empirical field research. The effectiveness of prescribed fire programs in reducing the overall impact of wildfires has been examined using a variety of methods, and at a range of scales. At the local scale, case studies have proved useful in illustrating the effects of different fuel conditions on fire behaviour, the resulting impacts on natural resource values and fire suppression difficulty. Remote sensing is increasingly being used to monitor the effects of fuel management at the landscape scale with promising advances in the ability to detect fires under a dense forest canopy. Assessment of program effectiveness at the regional scale is generally based on statistical trends in fire occurrence and size. The effect of fuel conditions on fire behaviour has also been studied experimentally, most recently by Project Vesta. In this paper examples of these different approaches are presented, and the strengths and limitations of each discussed. Recent case studies from south-west Western Australia and the Victorian bushfires of Black Saturday 7 February 2009 are examined. Fuels management can have important benefits to fire suppression that are subtle and difficult to quantify, such as increasing the safety, efficiency and effectiveness of suppression strategies. In this situation the lack of fuel management decreases the probability of first attack success under increasing fire weather conditions. An integrated approach that draws on a broad range of information offers the best way of quantifying the effectiveness of fuels management programs.