



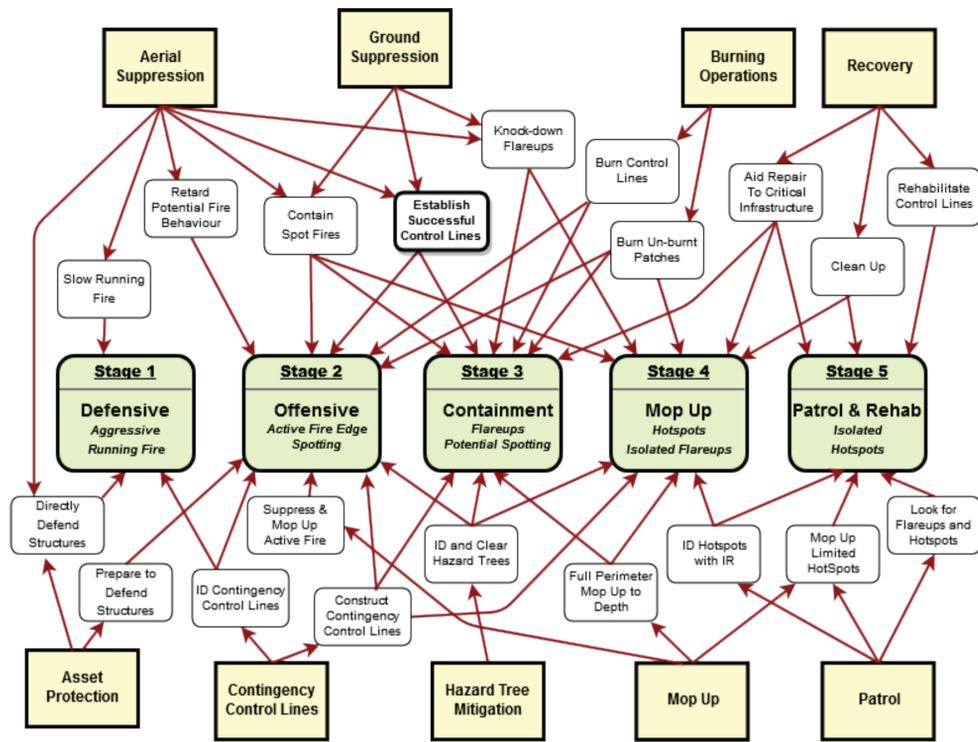
Large wildfire suppression in practice

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Aim Large-fire suppression is poorly understood even though large bushfires (over 500ha) account for a disproportionate amount of both hectares burned and suppression expenditure. Resource use extends beyond what has been established in the literature. The aim of this study was to classify suppression using the fire management agencies language and operational protocols as a guide, to answer a deceptively simple question: 'How are suppression resources being used on large wildfires?'



Results The figure (left) is a conceptual map of our findings. We identified 20 tasks (white boxes) by charting agency defined activities (yellow boxes) with our five suppression stages (green boxes – include descriptive fire behaviour). Existing literature focuses on the single task *Establish Successful Control Lines* (in bold). Defensive stage (1) fire behaviour is beyond the control capacity suppression resources. Resources make 'gains' on the fire in the *Offensive* stage (2) as emerging plans are executed. Post-hoc, the *Containment* stage (3) is the clearest to delineate with control lines along the sector perimeter. Some degree of Mop-up occurs in stages 2-5, but the focus of the *Mop-Up* stage (4) is complete perimeter mop-up to some depth (e.g. 30m). The fire interior smoulders in the *Patrol and Rehabilitation* stage (5) while isolated perimeter hotspots are extinguished and rehabilitation begins. The graphs below show resourcing for this multi-stage process. The line is the fire size and the bars are each days fireline ground crew. Multiple colours on a single day indicate that different sectors had different stages of containment.

Data & Methods Content analysis was used with three interconnected approaches: daily reconstructions of wildfire spread and suppression response, classification of suppression response in five progressive stages, and delineation of distinct fireline tasks within those stages. Data spanned 156 days and included linescans, GIS records, maps and 700+ Situation Reports and Shift Plans that describe planned and actual suppression efforts, strategies and the current fire situation.

Implications For suppression modelling to improve it needs to capture this complexity. This includes the development of resource requirements and production rates for all the identified tasks.

