

## Future options for fire behaviour modelling and fire danger rating in New Zealand

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For over a decade bushfire research in New Zealand has focussed on developing a national fire danger rating system and fire behaviour prediction models. The approach taken has been to implement and adapt the Canadian Forest Fire Danger Rating System to the NZ fire environment through empirical data collected from experimental fires and wildfires. Although research findings have directly contributed to improved fire management practices and increased community and firefighter safety, there are still significant gaps in the knowledge of fire behaviour in NZ fuel types. Current research is focussing on development of fire behaviour models for fuel types not included in the Canadian system. In particular, fire behaviour modelling in shrub fuels is a priority for bushfire research in NZ, given the significant proportion of bushfires occurring in these fuels. However, development of shrub fire behaviour models has highlighted the need to re-examine some of the fundamental principles guiding the NZ approach to fire behaviour modelling and fire danger rating. The NZ Fire Danger Rating System closely links fire behaviour prediction and fire danger rating, in contrast to other countries where the two systems are separated. This approach can create difficulties in distinguishing appropriate spatial and temporal fire danger levels versus site-specific fire behaviour predictions. Other issues concern the selection of appropriate model parameters, and the application of empirically-based systems in fuels different from those where observations were made. This paper reviews these fundamental issues, presents alternatives and options for fire behaviour modelling and fire danger rating, and emphasises the importance of research outputs meeting the needs of fire management.

***Managing bushfire in a changing climate***