From hectares to tailor-made solutions to prescribed burning

Hamish Clarke[1,2,4], Matthias Boer[2], Trent Penman[3,4], Owen Price[1], Brett Cirulis[3], Ross Bradstock[1]

[1] Centre for Environmental Risk Management of Bushfires, University of Wollongong, NSW [2] Hawkesbury Institute for the Environment, Western Sydney University, NSW [3] School of Ecosystem and Forest Sciences, University of Melbourne, VIC, [4] Bushfire and Natural Hazards CRC, VIC

Rising public and professional expectations require a greater, more transparent understanding of the trade-offs involved in the management of landscape fire and prescribed burning. This project provides a quantitative trajectory of risk reduction for multiple values in response to differing prescribed burning strategies.

IS THERE A ONE SIZE FITS ALL SOLUTION ACROSS MULTIPLE REGIONS AND ASSETS?

Utilising a project methodology drawing on fire behaviour simulations, impact analysis, cost estimation and Bayesian decision networks, we investigate whether there is an optimum management strategy that is robust to changing landscapes and asset types.

Based on 13 case study landscapes (see Figure 2), we analysed the similarity of the most cost effective solution in terms of risk mitigation for life loss, property loss, powerline damage and environmental assets (Figure 1).
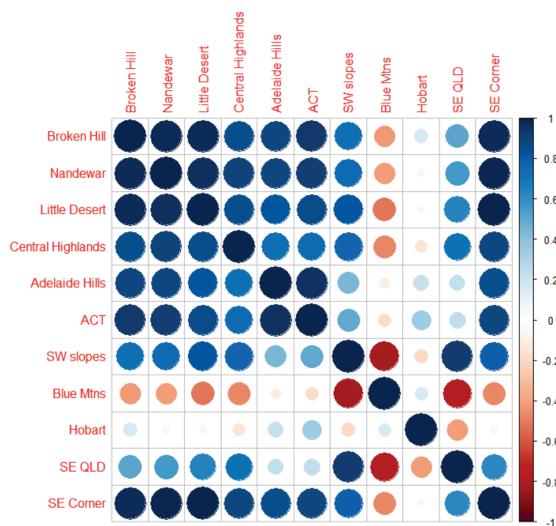

Figure 1: Correlations between standardized values for most cost effective prescribed burning solutions across 13 case study landscapes. Blue = similar solution, red = contrary solution, size and intensity of maker = strength of similarity between solutions

END USER STATEMENT – FELIPE AIRES, NSW NPWS

"It's expected that this project will trigger a significant change in the way fire management agencies deliver their hazard reduction programs and proposed fuel management activities. The project will support agencies to make more robust evidence-based decisions and tailor their burning programs to optimize risk reduction and cost-benefits according to their needs."

NEXT STEPS

The project team had a successful end user workshop in Sydney in March 2019 and is now focused on delivering:

- Modelling of climate change effects on risks to multiple values
- Analyses of the cost-effectiveness of differing prescribed
- Development of the first prototype of the Prescribed Fire Atlas (see Figure 2).
- Analysis of environmental predictors and similarity between case study landscape results to allow interpolation of results across entire region
- National workshop to promulgate the Prescribed Fire Atlas to end users and guide its implementation
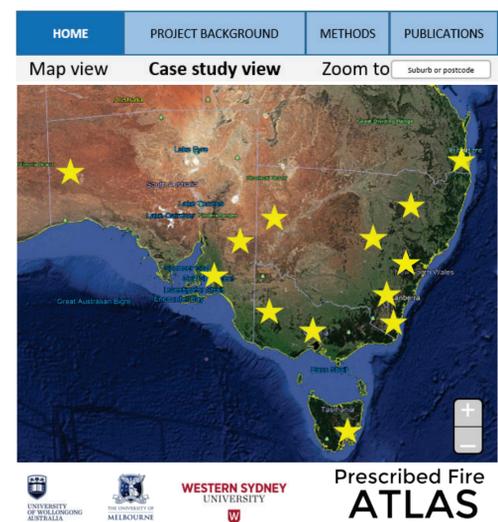
Figure 2: Conceptual sketch of the Prescribed Fire Atlas user interface

PRESCRIBED FIRE ATLAS

The Prescribed Fire Atlas is a tool for end users to explore, query and use outputs of the project. It will be used to guide the implementation of 'tailor-made' prescribed burning strategies to suit the biophysical, climatic and human context of all bioregions across southern Australia.

Project outputs cover a range of treatment strategies, management values and analyses e.g. risk, trade-offs, cost effectiveness. Project output is at the landscape-scale (~200,000 ha) and draws on 13 case study locations across southern Australia.