

OPTIMISATION OF FUEL REDUCTION BURNING REGIMES: DETERMINING FIRE SIZE



Tina Bell¹ and Belinda Kenny²

¹ Faculty of Agriculture and Environment, University of Sydney, NSW ² Fire and Incident Management Section, NSW National Parks and Wildlife Service, NSW

OPTIMISING FUEL REDUCTION BURNING AT THE LANDSCAPE- OR CATCHMENT-SCALE REQUIRES KNOWLEDGE OF THE EFFECTS OF FIRE SIZE ON KEY VARIABLES – FUEL LOAD, VEGETATION AND CARBON AND WATER CYCLES. ALTHOUGH SOME HISTORICAL WORK AROUND THE EFFECTS OF FIRE SIZE ALREADY EXISTS, THIS PROJECT WILL ADDRESS THESE KEY ISSUES WITHIN A STATISTICALLY RIGOROUS FRAMEWORK USING MODERN ANALYTICAL CAPABILITIES.

BACKGROUND

Fuel reduction fires (FRFs) can vary in size across four orders of magnitude. Fuel reduction burning is often patchy as a result of fuel and climatic conditions and inherent landscape-related features such as topography and soils. A strong sampling design is required to capture this variation. In addition, it is becoming increasingly obvious that as wildfires become larger they become more intense and thus have greater influence on soils and vegetation. It is unknown if the same situation arises with FRFs. The relationships between burn size and soil, water, vegetation and fuel outcomes has yet to be quantified. Our ability to predict the effects of FRFs of different size across landscapes is currently negligible.

To design an *a priori* sampling scheme of FRFs with appropriate statistical power, it is important to define what a 'small' fire is compared to a 'big' fire. Logically, larger fires will need to be sampled at a different scale and frequency than smaller fires – but what range of burn area might we be talking about?

DATA COLLECTION AND PROCESSING

To determine historical fire size, land and fire management agencies in NSW, Victoria, South Australia, Western Australia and Tasmania were approached for access to data relating to fire size, location and timing for the last 10 years. Patterns in fire size and timing that will provide valuable information for our sampling design are already emerging.

EMERGING PATTERNS

Mean fire size for NSW, Tasmania and the ACT was approximately 350 ha regardless of the total number of planned or completed FRFs. Fuel reduction burning occurs in fewer months in Tasmania compared to NSW suggesting that the sampling period in the two states would be quite different. Fire size varies with location and purpose of the burn, generally increasing in size from asset protection to strategic to land management burns.

CAVEATS

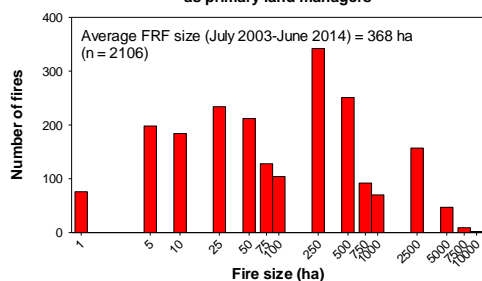
Each set of data comes with a number of caveats reflecting differences in the way information about FRF is captured and stored.

FRFs in NSW – The data depicted is only from the NSW National Parks and Wildlife Service. This agency has the most even spread of fire size, and contributes at least 50% of area of FRFs in NSW. FRFs conducted on Forests NSW tenure are clustered more in the mid range of fire sizes, while FRFs on other tenures, particularly private land, are skewed towards small fires.

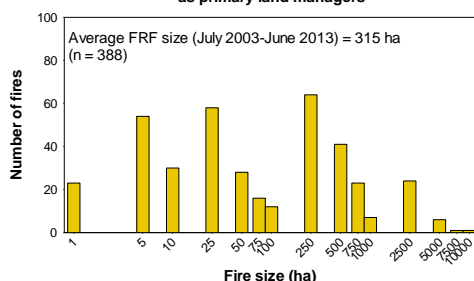
FRFs in the ACT – In the ACT there are many small burns (<100 ha) that are done for various reasons including high frequency FRFs in sites adjacent to houses and other assets. Alternative treatments are used to reduce fuel (e.g. mowing and cattle) especially close to the urban-rural interface. Some of the planned FRFs in the 2009-2013 period did not proceed due to adverse weather conditions caused by La Nina, threatened species or operational constraints and more or less fuel accumulation than expected.

FRFs in TASMANIA – The data provided is only for FRFs conducted by the Tasmanian Parks and Wildlife Service or Forestry Tasmania. Data is lacking for private land tenure.

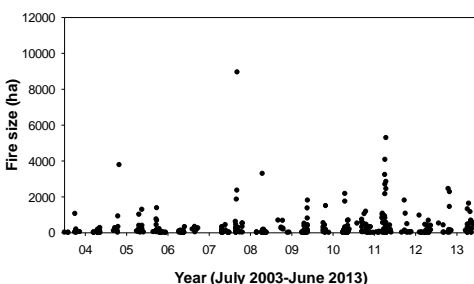
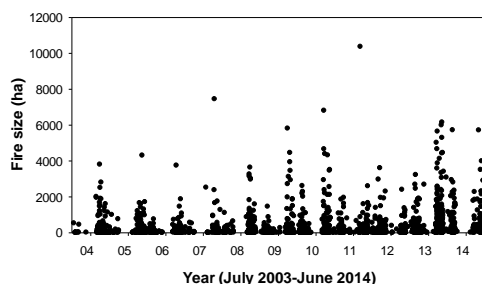
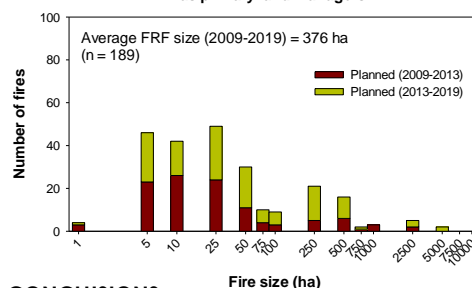
NSW National Parks and Wildlife Service as primary land managers



Tasmanian Parks and Wildlife Service or Forestry Tasmania as primary land managers



Department of Territory and Municipal Services ACT as primary land managers



CONCLUSIONS

A simple but important contribution from fire and land agencies during the early stages of our project will provide invaluable information for determining our sampling design. Our research can now be framed with the null hypothesis that: the size of FRFs (e.g. greater than 10 ha, less than 400 ha) will have no effect on environmental values or on their effectiveness in fuel reduction.

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