Concept Plan SP 2023-004

Quantifying fuel dynamics in southwest WA forests

BCS Fire Science

Project Core Team

X X **Supervising Scientist** Jennifer Hollis
Data Custodian Jennifer Hollis

Project status as of Aug. 10, 2023, 2:01 p.m.

X X New project, pending concept plan approval

Document endorsements and approvals as of Aug. 10, 2023, 2:01 p.m.

X X
Project Team required
Program Leader required
Directorate required

Quantifying fuel dynamics in southwest WA forests

Program

BCS Fire Science

Departmental Service

Service 7: Research and Conservation Partnerships

Background

Quantifying and understanding fuel dynamics is an essential part of forest management and fire management planning. Fuel characteristics are a primary predictor of fire spread and behaviour but are also paramount to forecasting fire danger, smoke plume development, emissions and fire effects. Spatial maps of fuel characteristics are increasingly being relied upon to support national fire management tools (e.g. AFDRS, SPARK, AQFx) as well as for government carbon accounting (e.g. FullCAM). DBCA Fire Management Services rely heavily on accurate fuel characteristic data for managing fuel hazard across southwest forests as well as being responsible for providing the data to support the national systems.

Aims

1. Establish improved accumulation models for fuel strata in southwest jarrah forests against time since fire, fire severity and jarrah forest type;
2. Assess fuel treatment effectiveness of mitigation methods using new methods, tools and knowledge;
3. Improve field-based assessment method and sampling protocol for fuel characterisation;
4. Collaborate on development of lidar/satellite/point cloud based methods for assessment of fuel characteristics;
5. Improve understanding of key drivers of woody fuel consumption and the linkages with carbon accounting, smoke plume development and emissions;
6. Improve spatial mapping of fuel characteristics and classification; and
7. Develop a Digital Fire Behaviour Database to represent recent and historical case studies to learn from, inform and evaluate predictive tools.

Expected outcome

0-5 years

In the short term the project will focus on establishing an efficient, comprehensive methodology and building a fuel and fire behaviour database to improve understanding of fuel dynamics in southwest forests.

5-10 years

The fuel and fire behaviour database will be used to increase accuracy of spatial fuel datasets in WA for better bushfire spread and behaviour prediction, prescribed burn planning, smoke modelling and fire danger and hazard determination. Improved understanding of fuel dynamics will directly increase the accuracy of national and departmental fire management tools and systems that rely on it.

The project will advance our understanding of fuel treatment effectiveness providing a solid scientific foundation to continue to inform DBCA fuel hazard mitigation operations.

Strategic context

This project will support integrated fire management to protect communities and natural values, informed by the best available scientific information and knowledge of fire dynamics. Through this project BCS will be able to better support Fire Management Services by providing the best scientific information and evidence-based guidance on fire risk and fire management effectiveness. It will also ensure scientific information is available for development of a carbon economy.

Expected collaborations

Internal:

1. DBCA Fire Management Services Branch: *Murray Mitchel, Stefan de Haan, Tony Smith, Ryan Butler, Chris Rumenos*
2. BC&S Remote Sensing & Spatial Analysis: *Paul Rampant*
3. BC&S Fire Science: *Val Densmore, Ian Radford*
4. Forest Management Branch: *Martin Rayner*

External:

1. CSIRO Marine and Atmosphere: *Fabienne Reisen*
2. Bureau of Meteorology: *Michelle Strack, Paul Fox-Hughes*
3. UNSW: *Ryan Tangney (ARC Grant, DBCA industry partner).*
4. CSIRO Bushfire Dynamic and Applications/ Data 61: *Miguel Cruz, Richard Hurley*
5. AFAC/ CFS: *Simeon Telfer*
6. Volunteer: *Lachie McCaw, Jim Gould*
7. DFES: *Agnes Kristina, Jackson Parker, Shaun Malloy*

Proposed period of the project

Feb. 16, 2023 – Feb. 16, 2033

Staff time allocation

to | X | X | X |

Role	Year 1	Year 2	Year 3
Scientist	0.45	0.45	0.45
Technical	2.25	1.25	0.85
Volunteer	0.1	0.1	0.1
Collaborator	1.85	1.85	1.85

Indicative operating budget

to | X | X | X |

Source	Year 1	Year 2	Year 3
Consolidated Funds (DBCA)	$21,700$27,300		$23,600
External Funding	$204,679 (DRF)$95,417 (DRF)		$50,499 (DRF)