

Research in the Wildfire Chronosequence Project

Turner, P.A.M¹., Grove, S.J²., and Airey, C.M².

¹School of Plant Science, University of Tasmania; ²Forestry Tasmania.

The Wildfire Chronosequence Project is a collaborative project between Forestry Tasmania and the University of Tasmania, with funding from the Bushfire CRC. Using a set of twelve permanent reference plots situated along a chronosequence in wet eucalypt forest of southern Tasmania, the project aims to investigate successional changes in forest structure. There is a particular focus on how a single catastrophic wildfire affects structural diversity, physical processes (eg. biomass accumulation, and nutrient cycling) and succession of biodiversity in wet eucalypt forest over a time-scale measured in decades or centuries. This research aims to inform forestry and conservation by contributing to the development of better ways of managing structural complexity and fire-dependent biodiversity in the landscape.



© J.P. Frahm

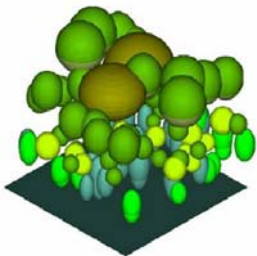


Fig. 1. Canopy model from Scanlan (2007). South facing wildfire plot, burnt in 1934, southeast isometric view. • *Acacia dealbata*, • *Atherosperma moschatum*, • *Eucalyptus obliqua*, • *Eucalyptus obliqua* (senescent), • *Nematolepis squamea*, • *Nothofagus cunninghamii*.



© Forestry Tasmania

Completed research

Cryptogamic diversity on coarse woody debris.

Browning, B. (2006). Honours thesis, University of Tasmania, Hobart.

This study investigated temporal change in bryophyte communities on coarse woody debris. Species diversity changed significantly with forest age.

Successional patterns of terrestrial bryophytes along a wildfire chronosequence in the wet eucalypt forests of southern Tasmania.

Hodge D., Pharo, E.J., Dalton, P.J., Turner P.A.M. (2006.) (submitted to *Tasforests*).

This study found significant change in composition with increasing stand age. However, with the exclusion of younger forests these differences were less distinct.

A methodology for modelling canopy structure. An exploratory analysis in the tall wet eucalypt forests of southern Tasmania.

Scanlan I. (2007) . Honours thesis, Australian National University, Canberra.

This methodology resulted in the creation of a spatial model of canopy structure using field data (genus, dbh and stem position) (Fig. 1). The methodology will be used as a means to 'ground-truth' remotely sensed data (such as LiDAR), and to hence map and monitor forest structure at the landscape level.

Variation in coarse woody debris attributes in Tasmanian tall wet Eucalyptus obliqua (L'Herit.) forests and implications for its monitoring.

Sohn J.A. (2007). Unpublished Hons. Albert-Ludwig Universität, Freiburg, Germany.

Using the detected patterns of CWD attributes, the study recommended that 'based on subplot (0.01 ha) level analyses, a 50 m X 50 m plot size was adequate for capturing the local range of CWD volume and decay class diversity'. This result is important for future monitoring and detection of CWD in a production forest landscape.

Stand-replacing wildfires? The incidence of multi-aged and even-aged Eucalyptus regnans and E. obliqua forests in southern Tasmania.

Turner P.A.M., Balmer, J. and Kirkpatrick, J.B. (2008). Submitted to *Forest Ecology and Management*.

An analysis of a large research plot data set from southern Tasmanian forest found over half the stands studied were multi-aged. The research found that modifications of forestry regimes and efforts to prevent frequent landscape-scale fires in wet eucalypt forests could help to maintain the existence of these biodiverse multi-aged forests in the landscape.



© J.P. Frahm

© J.P. Frahm



© Forestry Tasmania



© Forestry Tasmania



© Forestry Tasmania

Current research

Using macrofungal diversity as a tool in sustainable forestry management with special reference to the ectomycorrhizal species on soil and wood-inhabiting species on coarse woody debris.

Gates, G. PhD. Candidate. 2005 – 2008. University of Tasmania, Hobart

This study is currently being written up. One finding is that each of the studied four plots has a distinct macrofungal assemblage, which is largely attributed to strong relationships with associated vascular plants, and hence to some extent with stand age.

Exploring stand structure in Tasmanian wet eucalypt forests

Scanlan, I. PhD. Candidate, 2008 – 2011. Australian National University, Canberra.

This study will explore potential associations between on ground measurements or overstorey and understorey components with LiDAR.



© Forestry Tasmania



© DPIW

Future research

Beetles

Long-term responses of litter-dwelling beetle assemblages to wildfire and comparisons with forest harvesting

Bats

Long-term responses of bats to wildfire and comparisons with forest harvesting

Want to be part of this?

Further collaborative research with individuals/agencies and associated with the Wildfire Chronosequence Project is encouraged. If you are interested, go to the project web-site http://www.warra.com/warra/research_proj_FTicon.htm and select the Wildfire Chronosequence benchmark project.