# 118

## Determining the effect of repeated burning over 50 years in sub-tropical forests of south-east Queensland

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Frequent low intensity burning in forests is commonly used by land managers in south-east Queensland to reduce fuel biomass and the associated risk of wildfire damage. Frequent fuel reduction burning is particularly prevalent in the rural-urban interface zone, where dry eucalypt forests are in close proximity to residential zones. Frequent burning is also commonly used by the grazing industry to stimulate pasture growth and remove woody shrubs that compete with herbaceous species for nutrients and water. However, predicting the long-term consequences of frequent repeated burning is difficult, given the relative shortage of long-term manipulative fire experiments in Australia.

One group of long-term manipulative fire experiments in Australia is situated in south east Queensland. The Department of Primary Industries and Fisheries manages a series of long-term fire frequency experiments that were established from 1951 - 1973 in three ecosystems: dry spotted gum-ironbark forest, wet blackbutt forest and wallum heath. Originally established for examining the effect of prescribed burning frequency on growth, survival and regeneration of commercial tree species, these experiments have evolved to address a number of relevant issues to fire management in sub-tropical Australia. Specifically, studies have focused on determining the impact of fire frequency on soil processes and nutrient dynamics, fuel accumulation, tree population dynamics, plant composition and faunal assemblages.

The majority of the studies reviewed examined the response of taxa or soil processes to fire frequency, rather than deducing the causal processes. Despite this, a number of interesting results have given insight into potential mechanisms and have highlighted differences in soil processes and tree population responses to fire frequency among the habitat types. Fire frequencies represented by the experiments represent short inter-fire intervals (1 - 5 years), and reflect the current forestry practices at establishment for fuel reduction purposes. However, the shorter fire intervals have direct application to graziers and local councils that undertake frequent burning for either fuel reduction or pasture improvement. This review highlights the key results from these experiments, the knowledge gaps, the limitations and the future challenges to achieve greater understanding of long-term fire effects.

***Managing fire in modified landscapes***