

Using historical fire data to investigate patterns of biodiversity in southwestern Australia

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- Research questions**
1. How does fire history vary across the landscape?
 2. How does diversity and abundance of biota vary across the landscape?
 3. Can patterns of diversity and abundance of biota be attributed to patterns of fire history?

- Methods**
- To standardise the influence of time-since-fire on biotic diversity and abundance, we identified a contiguous study area of ~ 50 000 ha with the same fuel age (all burnt in 2002/03 fire season);
 - Contrasting fire histories (treatments) that we identified:
 1. Two consecutive short fire intervals (≤ 5 y) at some stage in last 34 years* ('short-short');
 2. Two consecutive long fire intervals (≥ 10 y) at some stage in last 34 years ('long-long');
 3. A moderate/mixed pattern of fire intervals over the last 34 years ('moderate/mixed');
 - We selected vegetation complexes from Mattiske & Havel (1998) mapping that occurred in each of these contrasting fire histories using data layers in a Geographic Information System;
 - In the field, we matched site characteristics and dominant over- and under-storey species to standardise plots within each vegetation complex across the range of fire history treatments.



Table 1. Number of plots in each vegetation complex for each fire regime

Fire regime	Vegetation complex			Total plots
	CA	COy1	COp1	
Short-short	4	4	0 [‡]	8
Moderate/mixed	7	4	3	14
Long-long	3	0 [‡]	5 [†]	8
Total plots	14	8	8	30

[†] For COp1 two of the five plots have a single fire interval of 30 years.
[‡] There were no areas within COy1 with a 'long-long' fire history, and no areas within COp1 with a 'short-short' fire history. A comparison of diversity and abundance data for the COy1 and COp1 'moderate/mixed' plots will determine if data from both vegetation complexes can be combined.

What data will we collect?



- Proposed outcomes**
- Knowledge of influence of contrasting fire regimes on diversity and abundance of biota in these ecosystems;
 - Guidelines for fire managers on appropriate fire regimes for conservation of biodiversity.

* 34 years was the extent of the most accurate fire history. The database contains information since 1953 for the study area; for other areas since 1937.