The effectiveness of wildlife habitat strips in maintaining mature forest carabid beetle assemblages

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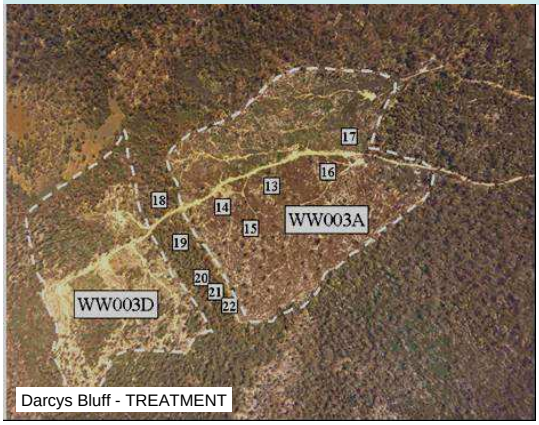
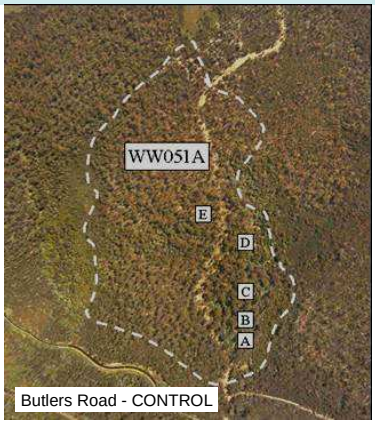
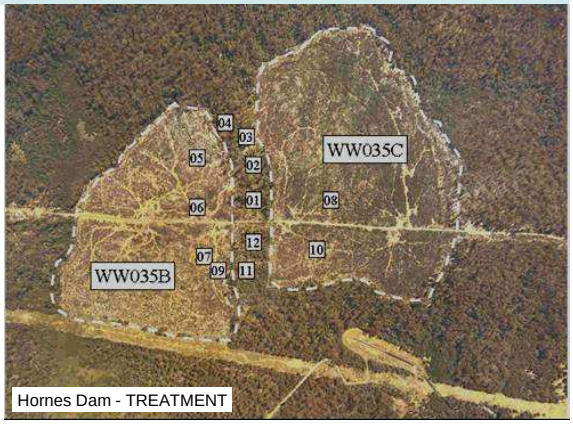
A long-term research project in wet eucalypt forest at Tarraleah, in Tasmania's central highlands, aims to assess the effectiveness of wildlife habitat strips (WHS) in maintaining the fauna of intact mature native forest. This poster reports on a 'before-after-control-impact' study of carabid beetles.



Darcys Bluff - TREATMENT



Butlers Road - CONTROL



Hornes Dam - TREATMENT

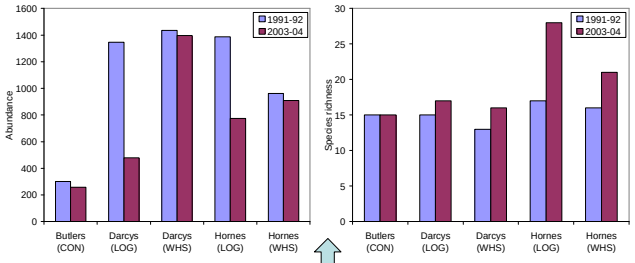
Methods: Beetles were sampled monthly using arrays of six pitfall traps at the 27 locations shown in the aerial photos (above), five at a control (mature forest) site and 22 split between two treatment sites. Sampling was carried out continuously for a full year (1991-1992) before any logging activity. It was repeated in the same locations eleven years later (2003-04), which was five to six years after logging and the concurrent establishment of the two WHS. Total sampling effort was 8888 pitfall trap samples.

	Control	WHS		Logged	
	Butlers Road	Hornes Dam	Darcys Bluff	Hornes Dam	Darcys Bluff
Sloaneana tasmaniae			↓↓	↓↓	↓↓
Rhabdotus reflexus			↑↑	↓↓	↓↓
Promecoderus longus				↓↓	↓↓
Notonomus politulus	↓	↓↓	↑		↓↓
Mecyclothorax ambiguus				↑↑	↑
Promecoderus brunnicornis					
Lestignathus cursor				↓↓	↓
Stichonotus leai			↓	↓↓	↓↓
Percosoma carenoides					↓↓
Simodontus australis		↓		↑↑	↑↑

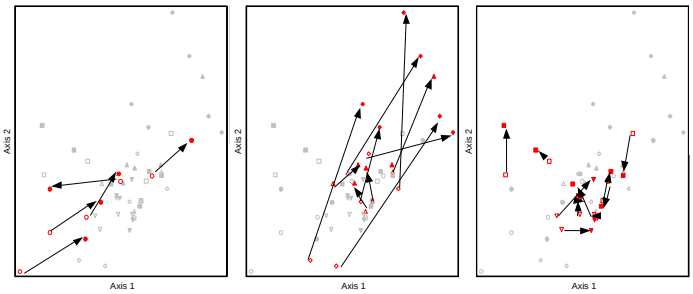
Results - 1
In total, 9244 carabid beetles were recorded during this study, comprising 39 species.

The table (left) shows the abundance trends between the two sampling periods for the ten commonest species (others were too infrequent for this analysis). Double arrows denote a higher level of confidence in a trend's statistical significance.

Most changes occurred in the logged areas, and these changes were consistent between the two study sites. Two species decreased in the control area but increased in the WHS and logged areas. Several species showed changes in the WHS, but none showed a consistent trend between the two study sites.



Results - 2
These two charts (above) show how carabid beetle abundance (left) and species richness (right) varied between the two sample periods and among the three sites and three treatments. For abundance, control and WHS areas showed little change over time, while logged areas showed a dramatic decrease. For species richness, the control area remained unchanged; WHS and logged areas showed increased species richness, with the biggest increase being in one of the logged areas. Most of the species contributing to these increases were open-country or early successional species.



Control Logged WHS

Results - 3
These three plots (above) show the same NMS ordination output, derived from an analysis of the entire data-set. They differ only inasmuch as each highlights (in red) the sampling locations representing a single treatment only, as indicated. Arrows point from the 'before' position of a sampling location (open symbols) to its 'after' position (filled symbols). The plots indicate that the composition of the carabid beetle fauna changed in most sampling locations. In the logged areas the change was dramatic. Overall, the change in the WHS areas was slight, and no greater than in the control area.

Conclusion: In this study, the WHS largely maintained the carabid beetle fauna of mature native forest in a production forest landscape dominated by younger forest age-classes. It remains to be seen whether these WHS can act as sources for recolonisation of surrounding regenerating forest as it matures, and whether they can maintain their structural and functional integrity over longer timeframes.

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