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# Variable retention harvesting in Victorian mountain ash forest

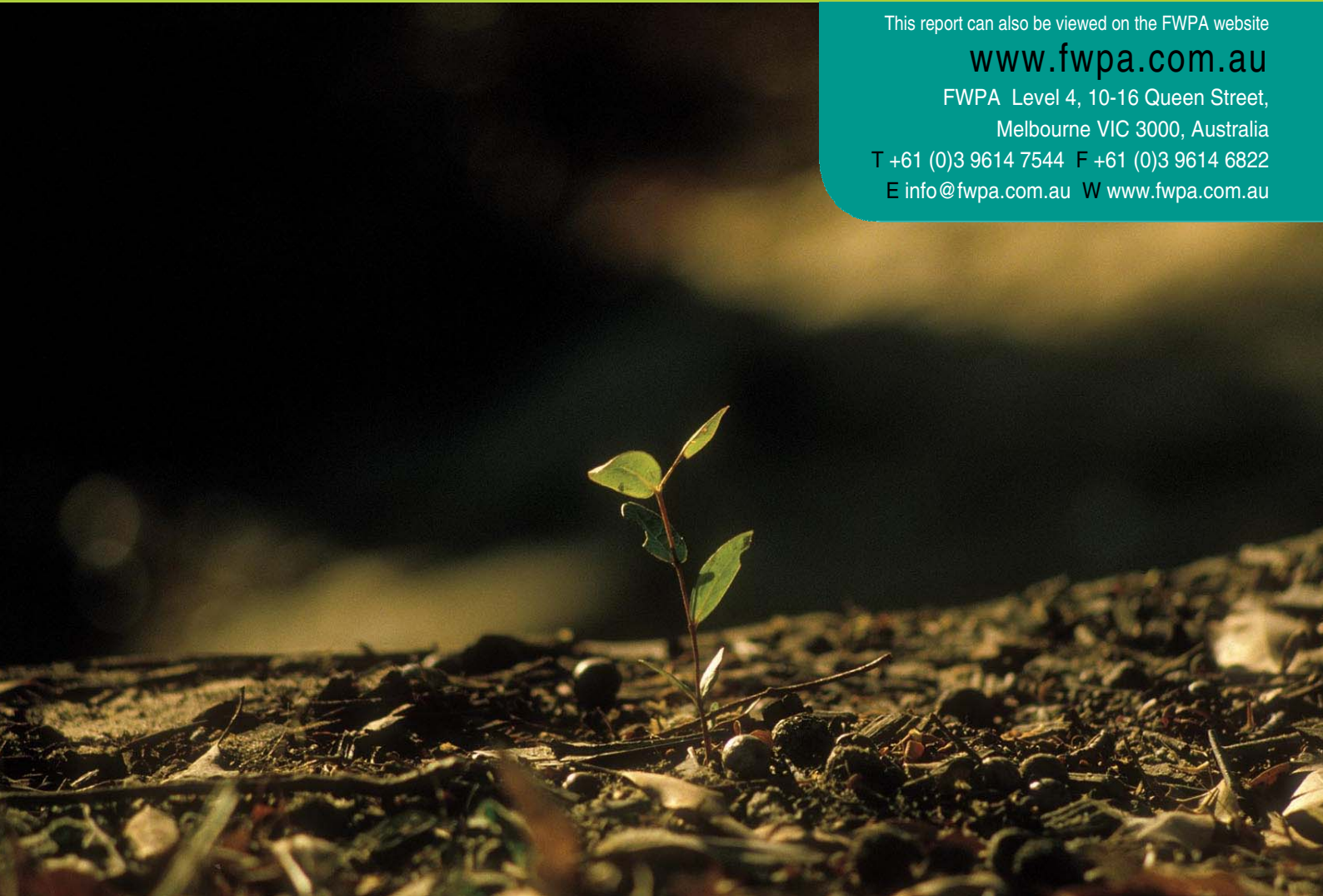
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# **Variable retention harvesting in Victorian mountain ash forest**

Prepared for

**Forest & Wood Products Australia**

by

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## Introduction

A major experiment examining the efficacy of the Variable Retention Harvesting System (VRHS) has been underway since late 2003. The study is focused on 1939 regrowth Mountain Ash (*Eucalyptus regnans*) forest in the Central Highlands of Victoria, south-eastern Australia. The experiment involves comparing biodiversity responses in traditionally logged (clearfelled) sites with coupes where islands of forest cover were retained (Lindenmayer, 2007). The key target response groups being quantified are birds, small terrestrial mammals and plants. These groups are surveyed before logging, after logging, after the application of regeneration burning, and then repeatedly once new stands of trees have become established in logged areas.

The VRHS experiment entails 24 coupes allocated to four experiment treatments in each of six blocks. The treatments are: **(1)** Traditional clearfell. **(2)** One retained island of 1.5 ha. **(3)** Three retained islands of 0.5 ha each. And, **(4)** No logging (1939 aged pseudo-coupe). The experiment will be fully implemented by late March 2009 – implementation was delayed by two years as a result of the accidental removal of islands. After this date the project will enter a phase of long-term monitoring and the longitudinal response of different biotic groups will be quantified over time. A major series of scientific papers will be published from the work, commencing in mid-2009 and these will further develop the points summarized in this overview report.

## General Summary

Several important insights have emerged from the work to date and these are briefly outlined below.

- VRHS is more difficult to implement than traditional clearfelling. However, the work to date has indicated that it is logistically feasible to implement VRHS in logged Mountain Ash forests. In particular, islands of 1.5 ha are more straight-forward to establish and maintain than multiple ones of 0.5 ha, especially during the regeneration burning phase of coupe preparation. It appears most appropriate to implement VRHS on flatter parts of the landscape. This is because these areas are likely to be the safest ones for forest workers. It is also likely that islands on flat coupes will be those most straight-forward to protect from regeneration burning. Thus, VRHS is appropriate for a subset of areas targeted for logging. Earlier work suggests that an appropriate target for the implementation of VRHS would be ~30% of coupes (Lindenmayer, 2007).
- There are substantial reductions in populations of small mammals and birds on logged sites immediately following harvesting of the area immediately adjacent to retained islands. This result was expected given the amount and spatial arrangement of forest habitat that is

removed as part of logging operations. However, small numbers of individuals of several species of birds as well as small mammals (Agile Antechinus and Bush Rat) persist permanently in the islands, not only directly after logging but also following the regeneration burn and the development of regenerated stands in the surrounding harvested area. Work conducted on mammal populations in small areas of retained forest elsewhere in south-eastern Australia suggest that residual animals in heavily disturbed areas may contribute to post-perturbation population recovery (Lindenmayer et al., 2005).

- Distinct changes in the bird assemblage have been observed within 2-3 years of the development of regenerated stands in the area surrounding the retained islands. These initial findings tentatively suggest that patterns of species richness may recover relatively quickly to pre-logging levels.
- Some components of the vegetation cover and plant species composition of the retained islands have undergone some deterioration following harvesting in the surrounding coupe. The extent of deterioration appears to be linked with the amount of scorch of the regeneration burn.
- A major project allied to the VRHS experiment has been a long-term monitoring program across 161 sites distributed widely throughout the Central Highlands of Victoria (Lindenmayer et al., 2003, unpublished data). Ongoing data collection on mammals and birds in that project will be important to assist in the interpretation of biotic responses to the various treatments in the VRHS experiment.
- Some groups of biota such as reptiles are too rare both in the treatment and the control coupes to enable sufficient data to be gathered to make useful inferences about their responses to VRHS.
- The experiment has been a substantial exercise to implement and has involved close collaboration between ANU researchers, DSE staff and logging contractors. The work provides a rare but nevertheless important example of true active adaptive management.

### **Future work**

Extensive data on birds, small terrestrial mammals and plants have been gathered from repeated surveys over the six years of intensive field work. These data will be analysed in detail commencing April 2009 and an extensive appraisal of biodiversity responses to VRHS will be completed at that time. In addition, a key aim will be to continue long-term monitoring of all 24 coupes in the experiment for at least a 10-20 year period beyond March 2009. This will be important to quantify

longer term responses and hence fully quantify the potential for the VRHS to integrate production and conservation values within multiple use Mountain Ash forests.

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