

13 Tall eucalypt forests

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SUMMARY

Tall eucalypt forests are iconic ecosystems renowned for the great height, high biomass and rapid growth rates of the trees that constitute them. These forests are highly valued for their biodiversity, timber production and social values. In the past, these values have been threatened by land clearing for agriculture, but now the most threatening processes come from unsustainable timber harvesting practices and changes in the fire regimes that characterise these forests. Tall eucalypt forests have been the focus of many research initiatives largely focused on understanding disturbance ecology and the impacts of timber harvesting on a range of forest values. The four core studies presented here reveal trends in fungi, birds, arboreal marsupials, vascular plants, invertebrates and tree growth in tall eucalypt forests and the way that various silvicultural treatments, fire events and climate drivers influence these trends (see Box 13.1). An analysis of tree growth from over 1000 permanent inventory plots distributed across Australia indicated that tree growth in tall eucalypt forests is related to a range of climatic variables. Predictive models based on these relationships infer a decrease in tree growth under various climate change scenarios. Plot networks in the Mountain Ash and Alpine Ash forests of Victoria revealed highly idiosyncratic

temporal changes in populations of arboreal marsupials and birds, particularly after the 2009 wildfires. Long-term monitoring of birds, fungi, beetles and vascular plants in harvested and unharvested forest plots have informed forest management practices in the forests of southern Tasmania and south-western Australia. All of the plot networks presented in this chapter have been important in documenting trends beyond those which the plot networks were originally designed to detect. However, despite well over 25 years of dedicated research in these systems, the trends identified represent a preliminary understanding of environmental change in these ecosystems that operate on temporal scales of months to centuries. As such, ongoing monitoring of current plot networks and the establishment of well-designed new plot networks in tall eucalypt forests is imperative to properly inform sustainable forest management.

INTRODUCTION

The focus of this chapter is on tall eucalypt forests and what networks of long-term plots within these forests have revealed about environmental change and biodiversity in this ecosystem. The quality and volume of timber in tall eucalypt forests is central to Australia's native forest timber industry. These iconic forests