# Contents

Foreword iii  
Preface vii  

1 **Introduction**  
   Lives and assets at risk 3  
   Fire regimes and risks to ecological processes and biodiversity 5  

2 **Bushfires in Australia**  
   An overall view 9  
   Bushfires in the southern forests 12  

3 **The nature of fire**  
   Sources of ignition 19  
   Fuels in the forest 19  
   Forest Fire Danger Index 26  
   Colour plates 21  

4 **Ecology, fire and the Australian biota**  
   Ecology: some dominant themes 33  
   Fire and the Australian biota 37  

5 **Fire and ecological processes**  
   Introduction 41  
   Fire and carbon 42  
   Fire and nutrients 48  
   Fire and water 56  
   Concluding remarks – carbon, water and nutrients 60  

6 **Fire and climate change**  
   Introduction 61  
   Future climates and fire weather 62  
   Changes in climate, forest productivity and fuels 64
Changing climates and plant adaptations 67
Changes in climate: fire and carbon budgets 68
Summary 69

7 Fighting fire with fire: I. Why fuel-reduction burning? Does it achieve its aims? 71
Testing the hypothesis: ‘Fuel-reduction burning decreases intensity and rate of spread of subsequent bushfires’ 72
Are we approaching a scientific consensus on fuel-reduction burning? 83
Summary 84
Appendix: Contrasting approaches: Western Australia versus New South Wales and the Australian Capital Territory 85

8 Fighting fire with fire: II. Fuel-reduction burning and diversity 91
The nature of research on fire regimes and diversity in southern forests 92
Planning fuel-reduction burning for diversity outcomes 97
Variability of fuel-reduction burns 98
Conclusion 99
Appendix: Ecological effects of repeated low-intensity fire in mixed eucalypt foothill forest in south-eastern Australia 102

9 Concluding comments: fuel reduction is essential for effective fire management in Australia 107
10 key points: the case for fuel-reduction burning 107
10 key reasons (or excuses) for inadequate programs of fuel-reduction burning 110
Education and research 116

Endnotes 121
References 125
Index 141