3 Our capacity to tell an Australian ecological story

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SUMMARY

This chapter investigates the combined power of the long-term environmental monitoring studies, which are documented in the following data chapters (5 to 13), to inform on environmental change at a national scale. That is, to tell an Australian ecological story. We compare the locations of the core studies included in this volume against nationally consistent environmental classifications that are regularly used by Commonwealth and state government agencies to make management and policy decisions. Our chapter highlights areas where we have good spatial coverage of environmental monitoring and also areas where there are insufficient monitoring sites to appropriately inform decision making. We find that the most habitable and/or productive areas, in terms of climate, are those most intensively sampled (see Box 3.1). Conversely, the majority of the vast arid areas of the continent are most poorly sampled. This finding is not surprising, given the proximity of research institutions to the most habitable and agriculturally productive areas, and the logistical challenges faced when accessing arid Australia. However, under-sampled areas, and the vegetation communities that dominate them, constitute the major proportion of our country and we encourage sustained future investment in long-term research in these areas to maximise our capacity to tell a more accurate Australian ecological story.

INTRODUCTION

Australia contains some of the oldest and most-weathered landscapes (Gale 1992; Twidale 1997), and the most nutrient-poor soils in the world (Orians and Milewski 2007; Morton *et al*. 2011). Yet, it is also one of the world's most mega-diverse countries (Mittermeier *et al*. 1997). Over the millions of years of isolation (Byrne *et al*. 2008), Australian flora and fauna have evolved adaptations to high temperature (Hoffman and Parsons 1997), variable water availability (Byrne *et al*. 2008; Nimmo *et al*. 2012) and frequent fires (Bowman 1999; Bradstock *et al*. 2012). Australia's highly variable climate supports a broad range of globally significant ecosystems (Braithwaite 1990), ranging from tropical to temperate and from arid to alpine environments (Stern *et al*. 2000).

To manage these unique resources, we need to understand the key components of ecosystems, their distribution, and the key drivers of ecosystem function and change, both natural and human. This book