

# 10 Desert complex environments

*Christopher Dickman, Glenda Wardle, Jeff Foulkes  
and Nicki de Preu*

## SUMMARY

Desert complex environments cover much of inland Australia and are defined here as areas that are dominated by hummock grassland. These vast areas are repositories of biotic diversity and contain richer communities of lizards, small mammals and some insects than any other of the world's deserts. Long-term monitoring plots in different parts of the desert complex biome show that plants and animals typically go through 'boom' and 'bust' cycles in their numbers and distributions, and that these spectacular events are driven primarily by heavy rainfall events and intervening droughts. Heavy rains increase the cover of hummock grass and stimulate the flowering and seeding of this and many other desert plants. The surge in plant growth is exploited by seed-eating and herbivorous native mammals and birds, while insect-eaters track and exploit increases in invertebrate populations. Irruptions of many species are short lived, lasting only 1–2 years, and fade as resources decline when conditions begin to dry. Dry vegetation can provide the fuel for extensive wildfires that remove ground-level vegetation and shelter for small native animals, which then may be vulnerable to predation from both native predators and introduced feral cats (*Felis catus*) and Red Foxes (*Vulpes vulpes*). Our

networks of desert plots allow us to monitor changes in the presence of different species over time, confirm the habitats, foods and other resources that native species need to persist, and identify places in the landscape that serve as refugia during times of drought. They also allow us to quantify the effects of wildfires, introduced predators and overgrazing, and provide insights about how the desert complex biome might best be managed. Like most terrestrial environments, the deserts face the looming spectre of climate change. The long-term plot networks described here tell us how the biota currently responds to extreme climatic events. Also, and most crucially, they provide an ever-more valuable baseline to test and refine our ideas in future about climate change and its effects on the unique inland biota.

## INTRODUCTION

In this chapter we introduce the desert complex environments that occupy much of inland Australia and describe some of the processes that maintain and drive changes in their biodiversity. In doing this, we emphasise the critical contribution that long-term plots have made to our knowledge and understanding. The desert complex environments are among the