Genetics and the Extinction of Species — DNA and the Conservation of Biodiversity. Laura F. Landweber and Andrew P. Dobson (eds). Princeton University Press, Princeton, NJ. 1999. Pp. 189. Price £12.50, paperback. ISBN 0 691 00971 6.

The issue of species extinction is arguably the most emotive factor in conservation, yet being difficult to observe in nature, it is not well understood. The importance of genetic processes in extinction is controversial; demographic stochasticity generally holds favour as the most likely cause with most conservation biologists. However, some recent papers have produced evidence that inbreeding depression may well play a key role in population extinction (Saccheri *et al*., 1998). It is therefore timely to have a book exploring the relationship between genetics and the extinction of species. The book contains eight chapters each contributed by different authors and the coverage reflects their expertise, producing a mixture of case studies and process-based approaches.

The first chapter is ideal as an introduction, comprehensively explaining extinction risks in general, discussing the effects of small population size and then turning to the genetic issues within conservation. Chapter 2 covers plant genetics and argues that, although loss of genetic diversity may not be an ultimate cause of extinction, knowledge of the distribution of genetic diversity can help identify priority populations for conservation. The short section on loss of self-incompatibility was rather confusing and in need of more detail. Chapter 3 discusses the theories behind preserving genetic diversity (where this is defined as heterozygosity, although perhaps a treatment of the different measures of variation would have been appropriate here) in captivity. Kathryn Rodriguez-Clark also points out that emphasis is placed on determining whether breeding practices retain heterozygosity rather than exploring whether, having achieved that, the necessary adaptive variation is retained to enable individuals to be successfully returned to the wild. Indeed, it might have been interesting to mention the work by Milligan *et al*. (1994).

In Chapter 4, easy to read and informative, Bill Amos reveals some fundamental misconceptions and clarifies what we can and cannot infer from genetic variability data. He also brings to light the issue of publication bias; we rarely read papers describing lack of variation that may occur in some species for reasons other than population decline. The section of this chapter on measuring genetic distance focused purely on microsatellites. Although well explained and necessary, since so many studies are turning to this marker system, an entire chapter could easily have been devoted to this type of issue. The inclusion of Chapter 5 was pleasantly unpredictable and treated population growth rates through time, thus providing a source of information about population dynamic history over a large time-scale that could be extremely useful for conservation biologists.

Chapter 6 is a fascinating account of the impact of the introduction of avian malaria on endemic Hawaiian birds. The authors explore how new molecular techniques can help identify resistant individuals during captive breeding to overcome this threat. Continuing the theme of Hawaiian birds in Chapter 7, Freed explains how genetics reflects specialization and resistance to disease and explains why some species of honeycreepers have become extinct whilst others have survived. Chapter 8 covered a range of topics regarding the use of DNA from 'ancient' sources and its retrospective content was well positioned at the end of the book. The description of contamination processes was fascinating; although it was unclear whether this was theory or supported by experiment. It was also pleasing to see a small section on the use of conservation forensics whereby DNA can be used to locate the origin of illegal elephant products, for example, to help enforce poaching laws, and that the issue of authentication was given the importance it deserves.

Despite the title, we felt that the emphasis often drifted from extinction and turned to conservation; the two are inextricably linked, but the processes involved are quite different. The chapters contain a stimulating diversity of topics but there are some obvious omissions, such as the important topics of hybridization and introgression. Overall, we certainly recommend this book as a useful addition to discussion on a growing topic and as very good value for money.

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