analysis of historical data to address this question. Records of success or failure of over 100 introductions of exotic bird species to Hawaii during the past 125 years permit calculations of how a species' risk of extinction depends on the number and morphological closeness of other species in the community — a role for competition is indicated in this case.

Section 3 discusses the problem of the appropriate choice of spatial and temporal scale in investigations of community ecology, and Section 4 contrasts equilibrium and non-equilibrium theories of community ecology. A recurring theme in these sections, and elsewhere in the book, is the importance of historical data. Paradoxically, although those who study modern communities regularly debate whether communities are at equilibrium, rarely have they consulted the fossil evidence. Margaret Davis emphasizes that on any time scale from a decade to 100,000 years climate does not fluctuate about a mean value, but exhibits long-term trends. Her data for forest trees, and those of Thomas Van Devender derived from plant and animal fossil remains in packrat middens in the Chihuahuan Desert, emphasize how communities have frequently become dismantled and reshuffled as species shift their geographical location differentially in response to changing climate.

The final sections deal with the variety of forces structuring communities and with the variety of kinds of community that exist. The message is that there is no single model to describe all communities — some are structured mainly by competition, some by predation, some by unpredictable disturbances and so on — but neither is every community unique. Thomas Schoener makes an initial assault on the problem of defining a minimum number of properties of organisms and environments that will enable us to say, for example, that for organisms of Type A, in environments of Type B, the dominant structuring force(s) will be of Type C (D, etc.). But there is still a long way to go.

Thirty years ago, a book about the multi-species level of ecological organization would probably have dealt almost exclusively with the flux of energy and nutrients between the environment and the community. More popular today is an approach to the understanding of multi-species assemblages based on knowledge of the dynamics of the constituent species populations. Indeed, the old distinction between population ecologist (a student of the abundance and distribution of individual species populations) and community ecologist seems to be fast breaking down. □

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Bird cake

John Andrews

The Sparrowhawk. By Ian Newton. *Poyser, Town Head House, Calton, Waterhouses, Staffordshire, UK/Buteo, PO Box 481, Vermillion, South Dakota 57069, USA:1986. Pp.396 + plates. £16, $35.*

IN THE battle being fought in many countries to protect rare or declining species, wildlife conservationists are often severely handicapped by lack of knowledge. What are the species' numbers and distribution? What are its requirements, and how can these be accommodated in a changing environment? Often the best we can do is to make an informed guess, always running the risk that error will harm the subject of our concern and weaken our modest influence still further. Against this background, Ian Newton's study of the sparrowhawk (*Accipiter nisus*) is valuable on two counts. First, it answers many of the questions relevant to the conservation of a bird much affected by human activities. Second, the research methodology and some of the conclusions may, with care, be applied to other accipiters and so advance research on them also.

Sparrowhawks breed in woods and forests across the Palearctic region from Ireland to Japan. In winter most of the boreal birds move south into the Middle East, India and south-east Asia. Close relatives occupy North America, Africa and southern Asia, the whole genus comprising about 50 species worldwide. Few escape the influence of mankind.

In Britain, progressive clearance reduced forest cover to 5 per cent of the land surface by the mid-nineteenth century, and accordingly restricted sparrowhawk distribution: then came the development of game preservation, and an era of intense persecution. Nonetheless, these evasive birds held on in small numbers, thinly but generally present over most of the country until, recently, organochlorine pesticides eliminated them from much of their range. Now, legal protection and, more importantly, changes in pheasant rearing methods have much reduced deliberate killing; afforestation has doubled the potential habitat and controls on organochlorines have permitted a rapid recovery in numbers over most of the country.

Newton, who is a senior ornithologist with the Natural Environmental Research Council, began his study of the species 14 years ago, selecting two areas of Scotland where he sought to trap and ring all individuals present and to find all their nests. From this basis he was able to explore the bird's ecology, making his own practical experiments to test hypotheses as the project developed and drawing on other researchers' findings. The work was complicated (but made more rewarding) by the fact that male sparrowhawks are half the weight of the females, so that they differ greatly in habitat usage, range of prey taken and response to factors such as weather and inter-specific competition (not to mention being killed by their own fair sex!).

Many individual birds were studied throughout their lives, enabling Newton to provide here a detailed account of the species' hunting and prey selection, dispersal and migration, breeding mortality and population trends, and of the human impact on their well-being. Much of the material has already appeared in journals, but, like a cake, the book's ingredients gain from being mixed and cooked by a skilful hand. The text is supplemented by crisp monochrome photographs and line drawings, while copious figures present results graphically with the supporting data set out in appendices. There is a good bibliography and an extensive, helpful index.

Ian Newton has a well-deserved reputation for sound research and for presenting his results in a carefully reasoned and readable manner. *The Sparrowhawk* is well up to expectations; it will be enjoyed by amateur ornithologists and professionals alike. □

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The sooty owl from Birds of Eucalypt Forests and Woodlands: Ecology, Conservation, Management. *Published by Surrey Beatty & Sons Pty, 43-45 Rickard Road, Chipping Norton, NSW 2170, Australia (A$47, US$43), it is based on the proceedings of a conference organized by the Royal Australasian Ornithologists Union.*