Book reviews

Edited by D. Jones

BIRDS OF SOUTHWESTERN AUSTRALIA: AN ATLAS OF CHANGES IN DISTRIBUTION AND ABUNDANCE OF THE WHEATBELT FAUNA

by Denis Saunders and John Ingram

1995. Surrey Beatty & Sons, Chipping Norton, NSW. Pp 296, colour photographs, 19, b&w photographs, 10, many maps, graphs, tabulations and an index. 298 x 210 mm. $39.95.

Any book describing the distribution and abundance of an animal group at a particular time in a particular place is a welcome addition to the biological references of Australia. Saunders and Ingram have taken the records of birds seen by observers in the central wheatbelt of Western Australia, collected between May 1987 and December 1990, as the basis for their study. They have added to them observations from other parts of south-western Australia. The combined collection has then been compared with published records from ten localities in south-western Australia, collected between 1900 and 1937. These comparisons are made in the maps and accompanying text that are the bulk of the book, dealing with 210 species of birds, including three introduced species.

The records of the 187 observers (1987–90) are the results of a community-based survey of the avifauna of the central wheatbelt conducted by the CSIRO Division of Wildlife and Ecology. For each species the authors have given a percentage occurrence score to the 1900–37 records and a similar score for each of the four years of the survey. By comparing these scores they assess the status of the populations of the species as increasing, stable or declining. In the concluding chapters of the book they analyse the correlations of the status of each species with its habitat preference, its diet and its nesting requirements. Finally they make recommendations about modifying the landscape, most of which is farmland, for the benefit of the bird, stressing that such modification will often benefit other aspects of farm management. These chapters are full of fashionable phrases and conventional wisdom, but are nonetheless a serious attempt to bring to the attention of land managers in the area possibilities of land management that take into account more than the bank balances of the current farming community.

It is easy to raise criticisms of the methodology of the 1987–90 study — that no attempt was made to standardise methods of searching, that species were treated as equivalent even though some were cryptic and some conspicuous, that all observers were not equally competent, that no method of analysis was employed that equalised the intensity with which different areas were covered — but the area covered was large and the human population sparse. The authors acknowledge some of the shortcomings of the survey, but stress its overall value, as a snapshot in time, and I agree with them. It is far better than no record and provides a reasonable basis for comparison with the past.

I am less happy with the numerical data. It would be dangerous to use these data in isolation from the texts. Statements about the status of some species conflict with the numerical data. For example it is said of the Pink Cockatoo 'The range of the Pink Cockatoo is declining'. Its scores (per cent of observers recording species) are given as 1900–37: 0; 1987–90: 12, 63, 6.0, 4.8. The statement about the declining status of this species is not based solely on the numerical data but rather on an interpretation of the published accounts of its status over the years. The strength of the book lies in these reviews of the literature, drawing together diverse sources to provide a fragmented, but valuable, account of the changes in the distribution and abundance of birds in the Western Australian wheatbelt over the twentieth century.

The maps are useful indications of the pattern of distribution of the birds, but the uneven coverage means that it is hard to make reliable comparisons across species, yet this is precisely what the authors do in their concluding chapters.

For many species a comprehensive list of dietary items is given, but without comment indicating the main diet in the WA Wheatbelt. I am reminded of the statement in the Raven diet section of the *Handbook of the Birds of Europe, the Middle East and North Africa* where the list includes, without comment, '... horse Equus, human Homo, fish (Pisces) ...' It would be interesting to know the importance of Homo in the staple diet of the Raven. Equally it would be useful to know the important components of the diet of the wheatbelt birds. Table 1, on which the conclusions are ultimately based, lumps all insects and invertebrates as 'invertebrates'. It is hard to see why so much space is given to listing the food items for most, but not all, species when the detail is not used. Another unsatisfactory aspect of the text is the descriptions of the sites of nests, especially for the waterbirds. Many species that habitually nest over water, even in the wheatbelt, are described as nesting 'on the ground', for example the Black Swan, the Pink-eared Duck, Dusky Moorhen and Swamphen. This

is a convenient approximation when constructing Table 1 (where only the grebes and Whiskered Tern are allowed to nest over water!), but conceals real differences of habitat selection between, for example, quails and rails. In many respects the species texts are useful précis of the birds' biology, but the inconsistancies of treatment mean that they cannot replace other reference books for this purpose.

Agriculture is an important industry; it provides our food. The status of bird populations is an important element of nature conservation. Somehow the priorities of both must be harmonised. Clearly the production of food requires the destruction of native vegetation, just as the preservation of birds requires the setting aside of nature reserves. This book describes a decline in distribution and abundance of birds that is an inevitable consequence of agricultural development. No one will question that. The book would have made a real contribution to the assessment of the conservation status of the birds if it told us, even for familiar species, how well populations are surviving over the twentieth century in nature reserves. That is where many of them will have to live if they are to survive at all. Regrettably it provides us with little information on this point. It mentions some losses, for example the Mallee Fowl, the Southern Scrub-robin, Crested Shrike-tit and Yellow-plumed Honeyeater, but not species where populations have survived in reserves.

Despite some shortcomings this book will prove an interesting record of the distribution of many bird species in the wheatbelt between 1987 and 1990. It will be a useful addition to public libraries and to the reference libraries of educational institutions.

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POLYGYNY AND SEXUAL SELECTION IN RED-WINGED BLACKBIRDS
by William A. Searcy & Ken Yasukawa

1995, Princeton University Press. Pp. 312, no photographs, some line drawings, paperback 235 x 155 mm. Price US$30.00.

After more than 1000 scientific papers published on Red-winged Blackbirds *Agelaius phoeniceus*, one of the most wide-spread and well studied birds in North America, surely we know everything there is to know about them. Not true. In what must have been a mammoth task, William Searcy and Ken Yasukawa have synthesised all information into one highly readable volume. In compiling *Polygyny and Sexual Selection in Red-winged Blackbirds*, they have made the diversity of information on this species easily available both to newcomers, and to those like myself who have found it difficult to keep track of the various approaches and often contradictory results put forward by various researchers in time and space. The authors provide a rallying point by asking, over 10 concise chapters, first why red-winged blackbirds are socially polygynous (chapters 2-6) and second, what are the consequences of polygyny, especially in terms of sexual selection (chapters 7-9). They show that even after many years of a major research program, there will always remain big unanswered questions in field biology.

The first thing I appreciated about the book was that although a single species account, it is by no means an account of a single set of researchers working in one location. Red-winged Blackbirds occur over a huge geographical range, behave differently in each, and have been worked on by different combinations of a large number of researchers. For example, in evaluating whether females suffer a cost of sharing a single male with other females (polygyny), the authors had to first examine how much females get out of their male in terms of parental care. It turns out that males in the eastern states of the USA provision young to some extent whereas those in the western states do not, although the reasons for this are not made clear. In either case though, the low level (0-17%) of such 'non-shareable' parental care means that female Red-wings do not have as much to lose as say females in many monogamous species where males often contribute half the care. This is just one example of how the authors have had to consider a variety of data in coming to conclusions that are general for the species. On the one hand this was frustrating as so many of the conclusions were made 'on balance' (e.g. three studies in favour, one against) but on the other hand the breadth of consideration was very convincing when a positive statement could be made. The authors also showed a clear preference for studies using experimental rather than descriptive techniques.

'On balance', the authors settle on a model of social polygyny in which females do the choosing. That is, they choose where to settle and, as a consequence, with whom to mate. There is no significant cost in choosing a male who is already mated, nor is there a direct benefit to polygyny *per se*. In such a scenario some polyg-

yny could occur by chance through random settlement, but in the case of the Red-wings, the females actively choose good territories with good nesting sites, and benefit from lower predation due to the presence of other nesting females. In building this scenario, the authors first trace the natural history of Red-wings, emphasising parental care, territoriality, female reproductive success and female choice as the important building blocks. They then test multiple alternative hypotheses relying especially on removal experiments to investigate the costs and benefits of polygyny to females. For example, a number of experiments have indicated that although settled females are aggressive to new females, their presence does not discourage further settlement on that territory. There is also strong evidence that settlement is influenced by specific attributes of the territory such as habitat type, vegetation type and density, food abundance and availability of elevated perches for vigilance. In contrast, there is little indication that females choose males for any other attribute beyond the quality of their territory.

With this 'no cost, no benefit' model in place, the authors proceed to their treatise of the consequences of polygyny in this species. They emphasise the difference between sexual selection in progress, and those traits that evolved as a consequence of past sexual selection. Although the high degree of variation in male mating success would appear to produce a strong opportunity for sexual selection, there is surprisingly little evidence that males with particular traits do better. Likely contenders such as song repertoire and epaulet size fail to make any difference; only body size provides a weak trend with larger males doing better. The authors spend considerable effort attempting to explain why sexual selection in progress is so weak. Assuming that differences in harem size are due to territory quality, the authors propose a 'lottery' model whereby males acquire their territories with a large degree of luck, such as being in the right place at the right time when a vacancy occurs. Once in place they are then difficult to dislodge. Thus, the differences in mating success would effectively be randomised, at least to some extent.

With current sexual selection apparently so weak, what about those traits that evolved in the past? The males' red and yellow epaulets proved easy to manipulate experimentally; those with artificially blackened epaulets have a greatly increased chance of losing their territories. Similarly, muted males are more likely to lose their territories, with some suggestion that song repertoires were also shaped by sexual selection. Body size is not so easy to manipulate though, and the authors rely on cross-species comparative tests to back their statement that size dimorphism is strongly correlated with the opportunity for sexual selection. Interestingly, the authors have trouble in supporting the seemingly obvious hypothesis that aggression is itself a sexually selected trait, although it is clear that territory defense is of paramount importance.

Finally, the authors look at what it means for the females to live in such close proximity, spending considerable time on whether they are territorial within the larger territory of their male. They are aggressive toward other residents, especially close to their own nests, but their use of space does not accord with strict territoriality. Females also have epaulets but these do not appear to function as a social signal. Instead, they have evolved complicated song repertoires with various elements directed at other females and at their own males.

All of these components and others unfold to tell the story of polygyny in Red-winged Blackbirds. Their mating system is of great interest as most birds are, at least socially, monogamous, and Red-wings provide a very practical system for field studies into why they differ. The authors fail to find support for many potentially exciting ideas, and the number of negative results does seem a bit frustrating at times. But I do think the book is a good demonstration of the scientific process at work in a long term and well-worked system in behavioural ecology. I recommend the book for any with an academic interest in mating systems and sexual selection, and also to anyone a bit separate from these fields who wants an efficient way to catch up on years of accumulating Red-wing literature. I also think this book would make a worthwhile addition to the reading list of any course in behavioural ecology and ornithology.

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