

BOOK REVIEWS

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COSMOPOLITAN FOREST BIRD ECOLOGY

Biogeography and Ecology of Forest Bird Communities.—A. Keast [ed.]. 1990. SPB Academic Publishing bv, The Hague. 410 pp. \$110 (cloth). ISBN 90-5103-047-9.

Studies of birds have played a prominent role in the growth of community ecology. In recent years, however, interest in avian community ecology has lost some momentum to other systems that are seemingly more amenable to experimental analysis. Thus, I received this book enthusiastically and hoped to gain new insights into the nature and study of bird communities. Conceived at the 1986 International Ornithological Congress, the book is appropriately worldwide in scope with 25 authors contributing 28 chapters in English (several authors, especially Keast and Blondel, contributed two or more chapters). Holarctic forests and communities are emphasized, but all major biogeographic realms are covered. The book is loosely organized into three sections: the forests themselves, selected forest bird communities (with emphasis on long-term studies), and chapters on specialized topics.

Three chapters provide an introduction to forest ecology. Although general in scope, this section provides a good backdrop for other chapters that deal exclusively with birds. Shugart defines forest simply as an area where trees form a closed canopy and then gives a brief account of different forest types at all latitudes. Shugart emphasizes the dynamic nature of forest ecosystems stemming from disturbance (operating at evolutionary and ecological time scales) and biological processes operating at diverse spatial scales. Clearly, habitat for forest birds is an ever changing mosaic. Hallé and the late A. H. Gentry provide chapters on tropical forests. Gentry's chapter is brief, but gives an effective account of the structural and taxonomic complexity of many tropical forests. Gentry and Hallé discuss this complexity vis. bird communities, and both consider the myriad coevolutionary links between birds and plants in the tropics. I was disappointed that this theme was not amplified in later chapters regarding the possibly critical role that birds may have, as seed dispersers and pollinators, in forest regeneration and succession.

The chapters on bird communities are diverse in their scope and approach. For example, certain authors (e.g., Tomiałojć and Wesolowski) emphasized ecological themes and organized their chapters around their own data; others (e.g., Keast) were more synthetic and biogeographical in approach and compared bird communities in selected faunal realms. Nearly all the chapters are descriptive and, while frequently advocated, few experiments are considered in detail. Nonetheless, I believe a "modern" perspective is taken by many authors because the effects of scale and landscape pro-

cesses, disturbance, and historical events (recent and distant) are frequently discussed.

In their chapter on northern coniferous forests, Haila and the late Olli Järvinen consider Old and New World bird communities at high latitudes. Unfortunately, bird communities of high elevation forests (in, for example, the western U.S.) are not considered. The authors clearly depict the modern taiga as changing throughout the Pleistocene and subject to frequent natural disturbance by fire. Although relatively few bird species inhabit these forests, usually 50–65, the communities are highly dynamic because resources are patchy in distribution and many species need to exploit several different habitats during the breeding season.

I was fascinated by Tomiałojć and Wesolowski's chapter on primeval temperate forest bird communities in Poland. Since 1975, the authors have studied avian populations in the Białowieża forest, a 1,250 km² undisturbed tract. Key data from this study offer insight into the ecology of bird communities where man's influence is minimal. Contrary to expectations, breeding densities, even those of cavity nesters, are generally much lower than those in younger, smaller European forests. Nest predation is high ($\approx 70\%$) owing to the high diversity of predators. This observation has important implications regarding the evolutionary importance of nest predation to the development of avian life histories. Finally, populations do fluctuate, but there is no evidence of density compensation among ecologically similar species. One unanswered question: how "natural" is the apparent long term *absence* of disturbance?

The interplay of historical (especially anthropogenic) and ecological factors on avian populations and communities is effectively illustrated in chapters by Blondel on Mediterranean birds and by Holmes on New England's deciduous forest communities. Blondel reports extensive human impact and describes the importance of successional changes in habitat structure. Blondel also reconstructs the avifauna's Pleistocene biogeographical history and discusses life history evolution on islands. Interestingly, despite the presence of numerous islands and peninsulas, few species are endemic to the region. Also contrary to predictions of theory, clutch size is lower on the islands, but survival rates are not high. Holmes reports that temporal changes in local densities and community structure stem largely from annual fluctuations in food abundance. This finding is based on observational and experimental studies. Species turnover associated with secondary succession drives longer term trends.

Complexity and great species richness are common themes in the three chapters on continental tropical bird communities. Nonetheless, the communities considered in detail appear to have different ecological conditions. In a general review on the Neotropics and Palearctic, Karr summarizes several patterns that appear common to most communities (e.g., high spe-

cies packing, numerous guilds, diverse food resources). Karr then discusses how tropical communities can differ, especially the extent of seasonality and movements of birds, and provides case histories from his long-term research in central Panama. Robinson et al. discuss the lowland forests in western Amazonia and portray an impressive web of complexity rooted in diverse habitats, successional changes, and specialized foraging. This chapter makes for an interesting comparison with that by Ralph on communities in Hawaii where specialization is common, but species richness is low. Robinson and his colleagues are convincing in their plea for large reserves if Amazonian communities are to be preserved.

Paleotropical bird communities in Gabon's rainforest are considered by Brosset. This chapter contains more information on reproductive ecology than the other chapters on the tropics. Contrary to popular belief, resources are not constantly available for tropical birds and there appears to be severe crunch periods during which birds will even forego breeding.

The chapters on specific subjects cover succession (Helle and Mönkkönen), paleotropical migrants (Lack and Wells in separate chapters), forest fragmentation (Robinson and Wilcove—temperate, Bierregarrd—tropical), resource ecology (Holmes), biogeographic history (Blondel), bird-forest interactions (Karr), and the annual cycle of forest birds (Keast). Nearly all these chapters comprised brief, but informative, literature reviews. An organizational flaw of the book is that these chapters complete the text; they should be read first with the case histories following. Karr's chapter in particular would serve as a suitable overall introduction to the book. Blondel's chapter on biogeographic origins of forest birds makes insightful use of refuge theory,

but would have been more effective if alternative biogeographic models of diversification were discussed in greater detail. The chapters on paleotropical migrants will be of keen interest to those studying the ecology and conservation of neotropical migrants. Chapters on Palearctic-African migrants (Lack) and on those in Southeast Asia (Wells) are included. Holmes provides a balanced critique of our understanding of food exploitation by forest birds and urges more rigorous, focused studies with experiments whenever possible. Bierregarrd's report on the Minimum Critical Size of Ecosystems Project left me anxious for more analyses of this unique experimental study. The discussion of antbirds using corridors to travel among fragments was especially interesting. In light of current controversies over corridors in maintaining biodiversity, data from this project deserve thorough scrutiny.

Who will find this book useful? As a library reference, the book is valuable because of its scope. I strongly recommend several chapters to North American students of avian community and population ecology who want to broaden their perspective. Data and issues relevant to the conservation of forest birds are in virtually every chapter. I do not believe that this book, alone, will support a course or seminar on avian community ecology. (Also, its cost is forbidding to most student budgets.) Typographical errors are frequent and the subject index is telegraphic. Nonetheless, Allen Keast and his colleagues deserve commendation for their planning and organization of this book. Similarly cosmopolitan texts on avian communities in other ecosystems such as grasslands are needed.—JEFFREY D. BRAUN, Illinois Natural History Survey, 607 East Peabody Drive, Champaign, IL 61820.