



EDITED BY ROBERT M. ZINK

*The following critiques express the opinions of the individual evaluators regarding the strengths, weaknesses, and value of the books they review. As such, the appraisals are subjective assessments and do not necessarily reflect the opinions of the editors or any official policy of the American Ornithologists' Union.*

*The Auk* 113(3):726–727, 1996

**Woodpeckers: An Identification Guide to the Woodpeckers of the World.**—Hans Winkler, David A. Christie, and David Nurney. 1995. Houghton Mifflin Company, New York. 406 pp., 64 color plates. ISBN 0-395-72043-5. Cloth, \$40.00.—Woodpeckers are some of the true eccentrics of the bird world, generally eschewing the more popular and trendier habitats and instead lurking on the backsides of trees, tapping away quietly and solitarily in search of grubs. Of course, there are a lot of grubs out there and a lot of tree backsides on which to tap, so it is not surprising that the Picidae is one of the more successful avian families, with 214 species distributed worldwide except for poor, depauperate Australia (which has to make do instead with taxa such as megapodes and lyrebirds). This volume is the second in recent years to focus exclusively on woodpeckers of the world. It consists of three parts: an introduction to woodpecker biology; color plates illustrating virtually every known species and morphologically distinct form of woodpecker, piculet, and wryneck; and a comprehensive set of species accounts summarizing current knowledge about each species.

The authors generally follow the taxonomy of Sibley and Monroe (*Distribution and Taxonomy of Birds of the World*, 1990), but major differences between their treatment and previous work by Short (*Woodpeckers of the World*, 1982) and others are carefully summarized in the introduction, which manages to provide a thorough crash course in practically all aspects of woodpecker biology in a mere 35 pages. Not only systematics and taxonomy but functional morphology, molt, foraging behavior, displays, reproductive biology, and conservation biology are all broadly surveyed in sections that seem longer than the actual number of pages devoted to them due to a combination of good writing and the tiny font used in printing. The biology summarized in these sections is up to date, accessible to the layman, and scientifically accurate. Most critical aspects of woodpecker biology are touched on, if only briefly. Thankfully, a full para-

graph is devoted to the ever-burning question, “why don’t woodpeckers get headaches?” The answer isn’t simple and involves a discussion of numerous specializations peculiar to birds in general and woodpeckers in particular.

The success of the authors is especially marked when it comes to summarizing some complex and even controversial issues. Their statement in the “Reproduction and Sociality” section regarding the benefits of philopatry hypothesis for group living, for example, is one of the few I’ve read that is both accurate and complimentary, yet manages to convey a point with which I can agree. They even succeed in occasionally interjecting areas worthy of additional research that are timely and well taken. I was rarely disappointed by the inevitable brevity of these vignettes, with possibly the exception of the “woodpeckers and man” section, which at half a page is too short a summary of woodpecker conservation biology for a book published in an era when one can easily imagine bounties being instated for the zygodactyl feet of some species in several western and southeastern states.

Each of the plates, which make up the middle third of the book, include complete illustrations of two to seven species, with many sexually dimorphic or geographically variable forms represented multiple times. These illustrations are rendered in the now classic, uniform style of a field guide but nonetheless really look like woodpeckers, are pleasing to the eye, and are excellent at their intended purpose of illustrating diagnostic characters.

The species accounts, making up over half the book, provide detailed information on each species, including small but adequate range maps, a short description and discussion of geographic variation, and paragraphs on voice, habits, food, and breeding. Key references are listed at the end of each account and are breathtakingly current. Much of the material in the accounts is a shortened, more easily assimilated version of information compiled by Short (1982) updated to include recent work when available. I found these accounts generally excellent, although I was distressed to see that Short’s misguided attempt at rendering the confusingly similar calls of the various

species is generally repeated and even compounded. Fortunately, as with the other sections, the descriptions of vocalizations are more concise, and thus easier to follow, than those in Short's earlier and longer monograph. I admit, however, that the solution to this problem is not an easy one; sonograms are visually more appealing but take up much more space and are only marginally more useful. Perhaps a CD-ROM of woodpecker vocalizations made to dovetail with the species accounts is the solution of the future?

In summary, I liked the book very much. It summarizes a vast amount of data on an intriguing family of birds both concisely and accurately, and the plates are nice. Academic libraries should certainly own a copy, as should anyone who likes woodpeckers in particular or just likes nice bird books and has a few dollars to spare. However, beyond this relatively limited audience, I'm unsure who the book is designed for or what the niche is that it is supposed to fill. Is it truly intended as a field guide? Are there really birders out there who travel around the world ignoring everything except woodpeckers? If so, I take my hat off to them, and urge them to order a copy immediately. For the rest of us, it would seem inefficient to embark on a birding tour accompanied by a suitcase full of field guides covering the individual families of birds rather than the avifauna of the localities we are planning to visit.

As a third possibility, perhaps the book is designed for those globally minded birders who are hoping that some little-known vagrant species, perhaps a Greyish Piculet (*Picumnus granadensis*) from the Andes or a Little Green Woodpecker (*Campethera maculosa*) from West Africa, will suddenly alight in that dead pine tree left standing in the backyard precisely with such a windfall in mind. If so, this book is definitely for them.—WALTER D. KOENIG, *Hastings Reservation, University of California, 38601 East Carmel Valley Road, Carmel Valley, California 93924, USA.*

thological standpoint. It lies south of the tropical destinations of most foreign ornithologists visiting South America, and it has always had a smaller human population from which to develop an ornithological community than neighboring Argentina and Brazil. Despite this isolation and seeming lack of human resources, Floyd Hayes demonstrates in this monograph that the efforts of a small group of Paraguayan and foreign ornithologists, coupled with collecting expeditions by foreign museums, provide an informative picture of bird distributions in Paraguay. As a Peace Corps volunteer, Hayes contributed to ornithological research in Paraguay by making field observations and collaborating with Paraguayan ornithologists to gather distributional and abundance data from throughout the country. To complete his study, which was his doctoral dissertation at Loma Linda University, Hayes also undertook a meticulous survey of the published literature on Paraguayan birds. This included tracking down many old and difficult-to-obtain publications such as those of early explorers Félix de Azara and Winkelried Bertoni. Hayes also examined Paraguayan specimens in United States, Argentinean, and Paraguayan museums.

Sections on geography, climate and vegetation, and ornithological history contain useful information to introduce the reader to the country. A methods section outlines the approaches used to evaluate records and to investigate biogeographical hypotheses. In evaluating records, Hayes encountered difficulties both with historical records for which specimens were lost, and reports, both old and new, based on little documentation. The heart of the monograph is a list of relative abundance in seven geographical regions for 645 species known to occur in Paraguay. Throughout this section, Hayes employs several levels of political, geographic, or ecological subdivisions, and he conserves space by abbreviating province names. This initially makes it necessary to flip back and forth between maps and text, but with time the divisions and abbreviations become easier to remember. Hayes follows the main list with detailed accounts on 323 of these species (many of Paraguay's rare species and actual or suspected migrants, both boreal and austral). There also are taxonomic notes on 21 taxa (species with differentiated populations in Paraguay that might be better considered as separate species). The list section concludes with accounts of 104 species that have been reported for the country, but which Hayes feels are not yet properly documented (i.e. hypothetical), or are of doubtful occurrence. For these species, he details the reports and why he considers them invalid.

Hayes employs his list in a long section on biogeography, making regional comparisons of faunal richness, similarity, and uniqueness. This section, although interesting, demonstrates the need for additional work, as many of the comparisons and differences among regions could be affected by insufficient

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*The Auk* 113(3):727–728, 1996

**Status, distribution and biogeography of the birds of Paraguay.**—Floyd E. Hayes. 1995. Monographs in Field Ornithology, No. 1, American Birding Association. 224 pp., 27 figures (15 in color), 10 line drawings. ISBN 1-878788-30-2. Paper, \$29.95.—Although it is roughly the size of California, Paraguay is one of the more poorly known countries from an ornithological

data for some regions (particularly in the Mato-groense, Campos Cerrados, and Ñeembucú). He examines hypotheses about the importance of the Paraguay River as a barrier to dispersal, and concludes that there is no good evidence that the river has been a source of vicariance for the country's avifauna, favoring ecotones as barriers instead. However, he appears to support Nores' (*Auk* 109:346-357, 1992) contention that the banks of the Pilcomayo River, on Paraguay's southwestern border, have supported a forest corridor across the Chaco connecting the Yungas forests of the Andes (to the west) and the Paraense forests (to the east), despite also accepting the arguments of Silva (*Auk* 111:495-499, 1994) that counter this idea.

A short final section on avian conservation chronicles the demise of several species in the country (e.g. Vinaceous-breasted Parrot [*Amazona vinacea*] and Brazilian Merganser [*Mergus octosetaceus*]) and presents a sobering view of the current causes of habitat destruction (e.g. hydroelectric dams, cattle, timber-cutting) that are accelerating in many regions of the country. Although some habitats have been much less disturbed than others, with only 5% of its lands in national parks, Hayes feels many species could be extirpated from Paraguay in the coming years.

Neotropical ornithologists will find the lists, maps, descriptions of basic habitat types, bibliography, taxonomic notes, and gazetteer useful, and the history of ornithological exploration fascinating. The price is reasonable and the quality of publishing good. I found a few typographical errors, but they were minor. The only section in Spanish is an abstract, but at least the lists are readily accessible to non-English speakers. This publication is an ornithological contribution, *not* a field guide or bird-finding guide. However, anyone traveling in Paraguay will find it extremely useful for learning what is currently known about the relative abundance of species in the various regions of the country (ask anyone who attended the Fifth Neotropical Ornithological Congress held in Asunción shortly after the monograph was published). It is a must for libraries interested in maintaining up-to-date Neotropical references, and it should be consulted by anyone researching bird distribution in southern South America. Hayes emphasizes that there is still much to be learned about Paraguayan birds, but this monograph will hopefully form a strong basis for future ornithological studies in Paraguay.

This is the first in a new monograph series published by the American Birding Association and edited by Kenneth Able. If this first monograph is any indication, ornithologists will find this series useful. In addition to distribution studies, appropriate subject matter includes almost any aspect of ornithological research from population dynamics and conservation to behavior and life history.—JOHN M. BATES, *Zoology Department, Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, Illinois 60605, USA.*

*The Auk* 113(3):728-729, 1996

**Atlas saisonnier des oiseaux du Québec [Seasonal Atlas of the Birds of Québec].**—André Cyr and Jacques Larivée. 1995. Les Presses de l'Université de Sherbrooke et La Société de Loisir Ornithologique de l'Estrie. Sherbrooke, Quebec. vii + 711 pp., 1,100 distribution maps, numerous text figures, 12 transparencies. ISBN 2-7622-0106-3. Cloth, \$150.00 Canadian; Paper, \$59.95.—This atlas is the first (of which we can hope will be many) of its kind: An atlas to the birds of a region for all seasons. An enormous amount of data are summarized on the distribution and abundance of 303 species of birds based on 1,767,466 observations that occurred from 1970 to 1989.

The data, gathered by many observers, are mainly from south of 50° N latitude. For each species, observations were divided into four seasons. These are temporally defined to correspond, roughly, with the breeding season, fall migration, wintering season, and spring migration. The dates used to define these seasons differ, as appropriate, for each species. For each species there is a page of text summarizing the status, ecology, seasonal status, historical changes in abundance, and other relevant information. Facing the text are up to four maps showing the distribution and abundance of the species from the four seasons in Quebec, south of 50° N. Transparencies can be superimposed on these maps relating the distribution and apparent abundance of each species to the census effort, climate, geological region, water system, etc. In addition to the accounts of individual species, there is an extensive general discussion and analysis of the data, including discussions of the methods used, general tendencies of spatiotemporal variation in abundance of birds in Quebec, and trends in biodiversity. The many tables and eight appendices that summarize much of the data enhance the usefulness of *The Atlas*. Appendix 6 lists species by habitat and shows which species are exhibiting significant increases or decreases in abundance. As such, it will be of special interest to people concerned with conservation. The many illustrations enhance the book's attractiveness.

Other atlases have concentrated solely on single seasons, most commonly the breeding season. It is, however, imperative that we know about the distribution and abundance of bird species from throughout the year in order to adequately understand their biology and the many factors that must be weighed in making decisions about land use and conservation. Because the *Atlas saisonnier des oiseaux du Québec* is in French, readers not familiar with that language will find it somewhat difficult to use. However, each of the species is identified both by English vernacular name and by scientific name, and the maps and tables can easily be understood even with a minimal knowledge of French. This is the first comprehensive summary of the distribution and abundance of birds in

an area of immense size and ecological importance, and it is a very useful summary. I thus strongly recommend that all serious students of avian conservation and distribution purchase this volume. As well, this book belongs in all museum and university libraries. *The Atlas* may be purchased by sending a check for \$59.95 Canadian (or \$56.96 U.S.) to: André Cyr, Biology Department, Sherbrooke University, Sherbrooke, Quebec J1K 2R1, Canada.—J. D. RISING, *Department of Zoology, University of Toronto, Toronto, Ontario M5S 1A1, Canada.*

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*The Auk* 113(3):729–730, 1996

**Species Diversity in Space and Time.**—Michael L. Rosenzweig. 1995. Cambridge University Press, Cambridge, United Kingdom. xxi + 436 pp., 183 figures, 15 tables. ISBN 0-521-49618-7. Cloth, \$74.95; Paper \$27.95.—The questionable future of earth's biodiversity has prompted an increased need and demand to understand processes and patterns of species diversity. With this need and demand has come a resurgence of old questions and a wealth of literature, including new perspectives (e.g. Ricklefs and Schluter, *Species Diversity in Ecological Communities*, 1993) and reviews (e.g. Huston, *Biological Diversity: The Coexistence of Species on Changing Landscapes*, 1994; Brown, *Macroecology*, 1995). Michael Rosenzweig's book adds another volume to this effort. In the author's words, the book's primary function is "to tell today's students the story of species diversity in the voices that so delighted ecology in the 1960's and 1970's." Much of this work involved birds and was led by Robert MacArthur, to whom the book is dedicated. Rosenzweig refers to the book as "MacArthur's Chariot," and the influence of MacArthur's works and perspectives echoes throughout most chapters. The book is not simply a recounting of old literature, however. New commentary on past studies, new analyses of data, and some novel perspectives also can be found.

Rosenzweig tackles the immense topic of species diversity by dividing the book into patterns, processes, and explanations. In practice, the chapter boundaries are less defined, but generally the book begins by introducing spatial and temporal patterns in diversity (e.g. latitudinal gradients) and other, sometimes causal, factors (e.g. productivity, disturbance). A discussion of diversity processes, namely speciation and extinction, follows. The remainder of the book provides explanations for patterns and presents interesting perspectives incorporating examples from a wide array of studies at various spatial and temporal scales (including the fossil record). These

latter sections are the book's most valuable components. Rosenzweig concedes that geographic (allopatric) speciation remains the primary force underlying the evolution of new species; however, he explores competitive (sympatric) speciation in depth, speculating on its role as the "engine of adaptive radiation." The roles of distribution, abundance, and diversity in the probability of species extinction provide a discussion of population dynamics and stochasticity, without mention of potentially important genetic aspects of small population sizes beyond drift. Rosenzweig presents a progressive view of habitat and resource diversity as a coevolved response of organisms at varying diversities. He then wades through the literature on area and isolation effects on species diversity (island biogeography), providing a useful and insightful review that is well worth reading.

Rosenzweig's reviews of diversity patterns at broader scales are somewhat less satisfying. He ignores almost all previous hypotheses in his discussion of latitudinal gradients in species diversity. Instead, he argues unconvincingly that "latitudinal gradients must arise because the tropics cover more area than any other zone" (p. 284). Alternative hypotheses for latitudinal gradients are ignored, yet, elsewhere, numerous alternative hypotheses for the influence of energy flow on patterns of diversity are extensively reviewed and discussed (essentially the same paper as Rosenzweig and Abramsky published in Ricklefs and Schluter, 1993). Such unevenness in Rosenzweig's treatment of various topics is noticeable throughout the book; although some issues are covered extremely well, others receive only superficial attention.

In general, the book is candidly written and packed full of figures (54 in the chapter on island patterns alone!). Rosenzweig often provides logical and mathematical reasoning when laying out questions and patterns. This approach proves useful in some sections, whereas in others the focus on mathematical approaches takes away from the biology of the question. For example,  $z$  is the subject of many geographical comparisons, yet one must consult another text to find a precise biological definition for the term.

Rosenzweig also includes scattered notes on methodologies and general advice for approaching diversity questions. Specific discussions of certain methodologies are particularly useful (e.g. calculating diversity independent of sample size), but the general advice to approaching diversity questions is not. Some sections are excellent and provide useful and comprehensive reviews, but others are Rosenzweig's own perspectives on patterns and processes "supported" by correlations with unstated assumptions and unexplored alternatives. This weak-inference approach weaves its way through many chapters and is perhaps my greatest criticism of the book (and much of the biodiversity work from the past). The approach is illustrated by Rosenzweig's criticism (p. 242) of a

reanalysis of Vuilleumier (*American Naturalist* 104:373–388, 1970) by Vuilleumier and Simberloff (*Evolutionary Biology* 12:235–379, 1980): “Later, in a reanalysis, Vuilleumier and Simberloff (1980) took all the force out of the earlier paper. They did not say it was wrong, only that other hypotheses existed that were consonant with the results. But that is always true. The point is to make a prediction and test it.”

But *testing* predictions in science is not simply looking for consistent patterns. It requires ruling out potential alternative hypotheses and accounting for underlying assumptions. Throughout the book, Rosenzweig fails to advocate a rigorous approach for testing hypotheses and attempting to answer diversity questions. A notable example is his statistical argument that species with larger ranges should encounter a greater number of geographical barriers to gene flow, which should result in a greater incidence of geographical speciation. Statistically, this is true if all else is equal. Yet, we know that all else is not equal (e.g. Mayr, *Animal Species and Evolution*, 1963). Bird species with large geographic ranges typically have higher dispersal abilities than those with small ranges. Indeed, among bird species with small ranges in tropical undergrowth, a water barrier as small as 10 m can prevent gene flow between populations (Diamond, *Science* 179:759–769, 1973). Meanwhile, the countless water gaps that criss-cross the ranges of most broad-range, temperate birds probably are no more than a “passing thought,” let alone a geographic barrier. Despite unfounded assumptions, the argument that larger ranges should have more geographical barriers recurs throughout the book, making several appearances to support various claims.

In some sections, the focus on such claims at the expense of reviewing the many plausible alternatives takes away from the book’s value as a tool for teaching. Instead of reviewing hypotheses and processes in an even fashion, Rosenzweig attempts to draw conclusions where others have not, given what he feels is ample (although mainly correlative) evidence. Drawing premature conclusions and ignoring plausible alternatives misrepresent our understanding of diversity and can lead students astray. From this perspective, it is hard to imagine how this book can “help set the agenda for diversity research into the next century,” as the back cover suggests.

Nonetheless, knowledge can be gained from Rosenzweig’s perspectives on diversity. His lengthy involvement and love for the subject are conveyed well, and his perspectives, notably on island biogeography and habitat diversity, are valuable. Rosenzweig’s interpretations of the many works on diversity can be insightful and thought-provoking. It is these sections that will repay readers for the cost of the book.

Overall, the book has valuable components that provide insight into species diversity in space and time. It is, however, not all that the title (and back cover) might suggest. While it is definitely worth reading for those enthused with the subject, it is by no means a balanced and comprehensive review of all topics, patterns, and hypotheses. In the end, the need to understand processes and patterns of diversity remains critical. *Species Diversity in Space and Time* may both help and hinder our efforts to achieve this goal.—PAUL R. MARTIN, *Montana Cooperative Wildlife Research Unit, University of Montana, Missoula, Montana 59812, USA.*