Reviews

EDITED BY R. TODD ENGSTROM

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.

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Predicting Species Occurrences: Issues of Accuracy and Scale.—J. Michael Scott, P. J. Heglund, M. L. Morrison et al., Eds. Island Press, Washington, D.C. xvii + 868 pp. ISBN 1-55963-787-0. Cloth, $95.00.—"Battleship" was a favorite childhood game of mine. A friend and I would sit on opposite ends of the living room couch, each carefully guarding a piece of notepaper with a hand-drawn Cartesian grid of cells. The object of the game was to systematically or randomly probe the enemy's grid to find his battleships, and to do so before he found all of yours.

Today, ecologists and conservation managers are playing a fascinating and high-stakes version of Battleship, attempting to predict the occurrence of species on gridded spatial maps. *Predicting Species Occurrences: Issues of Accuracy and Scale* collects 65 contributions from participants in a symposium held in 1999 at Snowbird, Utah. That meeting itself was a follow-up to an earlier meeting and symposium volume (Verner et al. 1986) on modeling vertebrate habitat relationships.

The current set of papers is phylogenetically more diverse (e.g. butternut trees, chanterelles, and lynx), but avian studies continue to dominate the field, if for no other reason than that avian occurrences in North America have been better mapped than those of any other taxon. The last 10 years have also seen an explosion of refined GIS georeferenced data sets, and the availability of fine-scale maps of many habitat variables that can be overlain onto occurrence data.

But all these new data have not made the task of predicting species occurrences any easier. In fact, the challenges are even more difficult. In all of these data sets, the number of potential predictor variables is often far greater than the number of mapped grid cells necessary for good model discrimination. Time-worn stepwise regression models usually fall victim to colinearity among the predictor variables. The result is models that are over-parameterized or do a poor job of prediction on test data sets. A great strength of this book is that it showcases new statistical techniques and tools for predicting species occurrence. There are good examples of Poisson regression, GAP analysis, CART regression, Bayesian model fitting, genetic algorithms, neural networks, and a host of other useful tools, many of which are new in the ecological literature. One is sure to pick up a few new ideas for analysis of your own occurrence data just by browsing this large work. Of course, none of these methods completely overcome the problem of teasing apart covarying predictor variables, but they all represent fresh approaches to old problems. The papers reflect a healthy skepticism towards model fitting exercises, and there are excellent discussion and analyses of data quality and accuracy, spatial covariation and spatial scale, parameter estimation, model validation, goodness-of-fit criteria, and likelihood analysis.

The contributions reflect an old "phylogenetic" schism between community ecology and conservation biology. Following the lead of R. H. MacArthur and colleagues, community ecologists early on embraced the Hutchinsonian niche and struggled to understand species occurrences in the context of potential competitors, predators, and prey resources. In contrast, conservation biologists embraced the Grinnelian niche and tried to predict species occurrences on the basis of measures of habitat structure. The branching does not so much reflect a difference in goals (understanding where species occur) as it does a difference in data: for pressing conservation needs of forecasting species occurrences under scenarios of climate change and habitat alterations, it is much easier and faster to gather good data on habitat variables than to measure competition coefficients or quantify the strength of species interactions in the field. Accordingly, nearly all of the papers in this book concentrate on measures of habitat structure to predict occurrence.

The contribution by D. C. Hahn and R. J. O'Connor is a noteworthy exception. These authors used

Classification and Regression Tree (CART) modeling of the occurrence of Brown-headed Cowbirds (*Molothrus ater*) and showed that host abundance is an important predictor of cowbird occurrence within recently colonized regions (eastern and western states, extending to both coasts), but is less important within the ancestral range of the cowbird (plains and prairies of the central Great Plains). On a smaller spatial scale, A.-M. Shapiro, S. J. Harper, and J. Westervelt used individual-based models and landscape simulation models to predict cowbird occurrence and develop management plans to reduce cowbird parasitism effects on populations of Black-capped Vireos (*Vireo atricapillus*) and Golden-cheeked Warblers (*Dendroica chrysoparia*).

Figure 65.1, the final one in the book, is the most sobering and interesting. J. Wiens presents a scatterplot illustrating observed versus predicted abundances (not occurrences) of Sage Sparrows (*Amphispiza belli*) on survey plots in western shrubsteppe. The predictive model was constructed from several measures of habitat structure taken from 1977–1982 at 14 sites in shrubsteppe of Oregon and Nevada. Although the relationship is a bit curvilinear, there is a solid fit with the data ($r^2 = 0.60$; $n = 52$) that any ecologist would be pleased with for a predictive model. But superimposed on the graph are 12 data points from a recensus of the sites same sites in 1997, fitted to the earlier habitat model. Those 12 points form an ugly scattershot and bear no resemblance to the earlier well-fitted model. The "rules" governing species occurrences keep changing through time, and that moving target is even more of a challenge to find than a stationary one.

We have moved beyond childhood games of Battleship, but there is still much work to be done in predicting where species occur. This volume is an excellent overview of the current state of the art. The book will appeal to ornithologists (many avian analyses), conservation biologists (detailed synthetic forecasts of species occurrences), and academic ecologists (new, worthwhile statistical tools). I am not usually a fan of contributed collections, but the papers in this collection were well edited. In spite of its massive size, the collection is concise, readable, and informative. Every conservation biologist and ecologist will find something of value in this sourcebook.—Nicholas J. Gotelli, *Department of Biology, University of Vermont, Burlington, Vermont 05405, USA. E-mail: ngotelli@zoo.uvm.edu*

Literature Cited

Verner, J., M. L. Morrison, and C. J. Ralph, Eds. 1986. Wildlife 2000: Modeling Habitat Relationships of Terrestrial Vertebrates. University of Wisconsin Press, Madison.

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Aves de la Sabana de Bogotá: Guia de Campo.—F. Gary Stiles, Clara I. Bohórquez, Carlos D. Cadena, Susana De La Zerda, Matheo Hernández, Loreta Rosselli, Martin Kelsey, Iván D. Valencia, and Douglas Knapp. 2000. Asociación Bogotana de Ornithologia, Corporación Autónoma Regional de Cundinamarca. 276 pp., 16 color plates by Robin Schiele, 2 color fold-out maps, 15 color photos of habitats. ISBN 958-96792-5-0. Softback, Price unavailable.—This handy little guide, measuring 5 × 8 inches, may have limited appeal to foreign birders because it is in Spanish and because of its small geographical focus. But its appearance—the work of Colombians and foreign residents—is a heartening reminder that, despite continuing civil strife and political chaos, there are still persons in Colombia committed to fostering understanding and appreciation of this country's natural environment.

Colombia's only modern countrywide bird book, *A Guide to the Birds of Colombia* by Hilty and Brown, was published in English in 1986. It has been widely heralded by foreign scientists and naturalists but, unfortunately, was expensive (for Colombians), never readily available within the country, and mainly used by a small minority of Colombians capable of reading English and able to obtain it through international conduits. A much-delayed Spanish edition, with a limited print run, was finally distributed within Colombia in the late 1990s. Both versions are aimed, in scope and detail, more at scientists and advanced naturalists than novices and young enthusiasts. The present *Aves de la Sabana de Bogotá*, although modest in scope, is a product with greater mass appeal to Colombians, especially those in the heavily populated Bogotá environs. In size, scope, and approach, this is a book largely by and for Colombians, and it should be especially helpful to students and younger naturalists learning birds, and in raising environmental awareness.

The book covers a bit less than 200 species—barely 10% of the more than 1,800 species now estimated to occur in Colombia. These are, however, the birds most likely to be seen around Bogotá, the most densely populated region of the country and one of the most degraded environmentally. Introductory chapters treat (1) habitats around Bogotá; (2) avifauna of the Sabana de Bogotá, including biogeography, ecology, migration, plumage, voice, and conservation; (3) basics of observing birds, and what we, as humans, can learn from birds; and (4) an overview of species accounts and a glossary of anatomical terms and colors used in describing and identifying birds—all aimed at helping those new to bird study.