REVIEWS

EDITED BY WILLIAM E. SOUTHERN

The following reviews express the opinions of the individual reviewers regarding the strengths, weaknesses, and value of the books they review. As such, they are subjective evaluations and do not necessarily reflect the opinions of the editors or any official policy of the A.O.U.—Eds.

Birds of the Cayman Islands.—Patricia Bradley and Yves-Jacques Rey-Millet. 1985. Singapore, World-Wide Printing. x + 235 pp., 34 color plates, 8 text figures. ISBN 0-903-826-76-3. No price given.—It has been said that many ornithologically interesting areas are strategically located with regard to avian biogeography. The Caymans (Grand Cayman, Little Cayman, and Cayman Brac) lie nearly equidistant from Central America to the west and Cuba and Jamaica to the east. These islands have a peculiar quality of their own. They are low-lying, fossilized limestone ridges whose combined area is less than 263 km^2. Only 45 species of birds breed there, of which 13 are endemic species or subspecies. In this tiny crucible of exposed, broken peaks of ancient limestone ridge lies the key to avian dispersal in the western Caribbean.

Bradley has bridged the gap for tyros and professionals alike with this volume and has redefined the link between eastern and western groups of Caribbean avifauna. The descriptions of range, local habitats and habitat use, and status of each species are concise and informative. Photographer Rey-Millet provides a standard of excellence with his color stills of resident species. A color photo or two of each breeding species, with the exception of the Grand Cayman Thrush (not reported since 1938) and the Jamaican Oriole (a subspecies now consider extirpated), form the centerpiece of this sturdy little guide. Only the photos of the Yucatan and Black-whiskered vireos leave a little to be desired as aids to identification. A real appreciation of these photographs becomes clear when one realizes just how difficult it is to see some of these birds, let alone take recognizable pictures of them.

The introductory material, Contents through Glossary (pp. 7–35), includes a foreword by H.R.H. The Duke of Edinburgh. If every field guide or treatise on the natural history of islands and other threatened areas could gain the attention of like-minded and committed personages, conservation of the world's birds would be greatly advanced. A preface by Oscar T. Owre provides a fine review and outline of the scope of the guide. The descriptions of the ecosystems and habitats are particularly good and valuable to the reader who requires more than a superficial view of the islands' striking, but seemingly simple, dry-regime forests and ponds. The maps and narratives of birding hot spots are helpful.

Bradley has done a great service to our understanding of the avifauna of the Cayman Islands. This volume makes a statement regarding the status of unique bird fauna on the eve of the 21st century and how the human population relates to it. The book neatly describes the human conflict with natural resources throughout the Caribbean region (pp. 28–29) and points up the failure of some governments to reconcile this conflict.

Particular kudos are extended to the World Wildlife Fund (International), which recognizes the value of producing a well-bound, hardback, quarto-sized field guide that will last. There is much to be said for longevity. This is surely no accident and is an affirmation of the value of the content, both scientific and photographic.—ROBERT L. NORTON.

The ecological web: more on the distribution and abundance of animals.—H. G. Andrewartha and L. C. Birch. 1984. Chicago, University of Chicago Press. xiv + 506 pp., illustrations. $35.00.—Everyone in ecology is familiar with the classic text "The Distribution and Abundance of Animals," published in 1954 by Andrewartha and Birch. It has been the major reference that emphasizes the extent to which density-independent processes affect the numbers of individuals in populations. Density-dependent interactions with other animals usually were found to play a lesser role.

This theme was eclipsed in the United States by two other paradigms. The first was community ecology, and the second was ecosystem analysis. Recently, these two themes have been plagued with criticism and self doubt (Hall and DeAngelis 1985, Bull. Ecol. Soc. Amer. 66: 339). Hall and DeAngelis contended that community models of biotic interactions frequently omit consideration of other environmental factors, and ecosystem-level simulation models have not led to a better understanding of forces that regulate populations. Perhaps it is time for a fresh consideration of the original questions. What forces affect the numbers of individuals in local populations of single species? What factors allow larger composite natural populations to persist across many generations?

Just this line of thinking has prompted professors Andrewartha and Birch to write "The Ecological Web: More on the Distribution and Abundance of Animals." In fact, they have undertaken the very ambitious task of formulating a general theory for all of

population biology. In their "theory of the environment," formal logic is applied to functional relationships in population dynamics. The original single-species focus remains, as does the Darwinian emphasis on fitness. The environment of an animal is everything that might influence its chance to survive and reproduce. It is defined separately by determination of averages (and presumably variances) for each population of interest. The components that act directly on the population (resources, mates, hazards or "mal-entities," and predators) are affected themselves by a web of indirectly acting components. Pathways of action are expressed as arrows in cluster diagrams, called envirograms. These arrows point from the web to the centrum of direct effects, and these in turn converge on the population in question. Once formalized in this way, the envirogram becomes a model whose relationships can be tested, preferably by experiment, and then refined. Thus, the construction of an envirogram helps the investigator to conceive the problem in its full complexity.

Detailed examples based on long-term data sets show the high level of differences among envirograms for different species. After a review of the moose (*Alces alces*) and timber wolf (*Canis lupus*) system at Isle Royale National Park on Lake Superior, the authors conclude that, although the predator affects the number of prey under certain conditions, neither the predator nor the prey sets limits to the other population, and no steady state is possible. In many examples of fluctuations in mammal and insect populations, the primary driving variable is apparently density-independent change in food supply, which is in turn a function of weather. For a sheep tick (*Ixodes ricinus*) in England and the cottontail rabbit (*Sylvilagus floridanus*) in the United States, a shortage of mates seems to be a factor in regulating distribution.

The two major ornithological examples are envirograms for the Grey Teal (*Anas gibberifrons*) in Australia and the Australian Black Magpie (*Gymnorhina tibicen*). For long periods, the teal is confined to drought refuges in marine inlets. In wet periods, which come erratically every 3 or 4 yr, the birds disperse widely and breed in temporary shallow ponds. The multipartite structure of the dispersed breeding population is partly responsible for the persistence of the large population. Even though local populations might go extinct, the species as a whole is buffered against extinctions. This is an incorporation of den Boer's (1968, Acta Biotheor. 18: 165) theory of "spreading the risk" into the theory of the environment. In the case of the magpie, intense intraspecific territoriality and the distribution of trees are important components of the envirogram. Competition and other biotic interactions are always potential factors to be considered.

The book as a whole is a scholarly and highly original approach to single-species ecology. Krebs (1985, Science 228: 873) thinks it is too general and that the book does not sufficiently acknowledge the experimental nature of research in population biology. Its strength is certainly in the area of establishing a framework for the formulation of problems, a framework that can incorporate all of the relevant empirical information at hand. In their 1954 book Andrewartha and Birch included a quote from Darwin: "Looking back, I think it was more difficult to see what the problems were than to solve them." The two main contributions of this book, over and above its richness in detailed accounts of the population biology of single species, are (1) elaboration of the theory of spreading the risk, which considers the dynamics of local populations in relation to composite larger populations; and (2) formalization of envirograms, which encourages simultaneous consideration of the processes that affect populations, along with their interactions.

I recommend this book highly. It would be an excellent choice for a graduate-level seminar course.—FRANCES C. JAMES.

Conservation of island birds.—P. J. Moors (Ed.). 1985. ICBP Publication No. 3, Norwich, England, Paston Press. x + 271 pp., 54 figures. ISBN 0-946888-04-3.—This volume contains 17 papers presented at a symposium on island management held at Cambridge in 1982 as part of the 18th International Council for Bird Preservation conference. The symposium contributors were chosen for their active field achievements rather than for comprehensive coverages of the subjects.

Part I, on processes affecting populations of island birds, contains papers on island biogeographic theory as well as a discussion of past and future problems. W. B. King sets the stage for the entire volume by pointing out that 93% of the avian species that have become extinct since 1600 were island forms, and island forms account for more than half of the world's endangered birds today. King describes the limits of the extinction problem on islands, noting the range of factors leading to extinction. He also provides practical procedures for reversal of island habitat destruction and species extinction. His contribution is followed by chapters by J. M. Diamond (Population processes on island birds: immigration, extinction and fluctuation) and T. M. Reed (Island biogeographic theory in bird conservation: an alternative approach) that provide a theoretical framework for understanding population dynamics of island birds. Reed wisely notes that it is simplistic to use only area to determine the usefulness of reserves, and suggests that habitat variety and closeness to colonizing sources are equally important. These three chapters provide an excellent introduction to the factors affecting evolution of island species and species extinction processes; they will be useful to biologists

and conservationists at all levels, and will be invaluable to beginning graduate students.

The remaining chapters in Parts I and II provide data on surveys of island birds and address specific problems of insular avian species. Topics covered include conservation of land birds; threats to birds on subantarctic islands; problems of introduced and feral rats, cats, goats, and pigs; and conservation problems of particular species such as the Dark-rumped Petrel, *Cyanoramphus* parakeets, and the Puerto Rican Parrot. The chapters clearly indicate the problems of introduced predators and of conservation efforts to preserve some particular species. Overall quality of presentation is high, although there are some exceptions.

The chapters on eradication of feral cats, rats, and goats on offshore islands will surely be useful to conservationists and managers, as well as serving as models for predator control for any isolated population, be it island, desert, or forest island. A table in Atkinson's chapter on the introduction of three species of rats to various Pacific islands provides needed information for ornithologists examining avian species on these islands. His discussion is insightful and is predictive for future rat problems on these islands. Moor's chapter on a similar topic describes practical methods of rat control used in New Zealand.

The chapters on conservation efforts on behalf of particular species present case histories that shed light on past processes and predict future problems for some species or groups of species. A. W. Diamond's chapter on land birds on islands in the tropical Indian Ocean is notable for its overview of both specific species and processes. Specific island accounts can be used by ornithologists to select study sites as well as to familiarize themselves with avian species composition.

The remaining chapters deal with conservation efforts on behalf of island ecosystems rather than target species. Wingate provides an excellent case study of restoration on one of the Bermuda Islands. Finally, Kepler and Scott provide a plan for conservation of island ecosystems. They call for a geographical approach that would manage threatened, fragile ecosystems.

This paperback book is produced on good paper, and bound well. Figures are clearly produced, although the type in the tables was reduced too much for easy readability. The information in most tables is too valuable to be so crowded. The book provides broad coverage of conservation of island birds, although I would have liked to see more on conservation of some northerly islands and some discussion of the problems on smaller, temperate coastal islands.

The book is an excellent introduction to problems of island birds and will be useful to advanced undergraduate and graduate students and to professionals interested in conservation. I highly recommend the first three and last chapters as an excellent introduction to biogeography, population processes, and conservation of island avifaunas.—JOANNA BURGER.

Status and conservation of the world's seabirds.—J. P. Croxall, P. G. H. Evans, and R. W. Schreiber (Eds.). 1984. Cambridge, England, International Council for Bird Preservation, Technical Publication No. 2 + 778 pp. ISBN 0-946888-03-5. $35.00.—This volume constitutes the proceedings of the ICBP Seabird Symposium held in Cambridge, England in 1982. Its 47 chapters consist of 39 geographical treatments of seabird populations and local conservation problems, 6 chapters providing overviews of specific classes of threats to seabirds, and 2 chapters detailing aspects of the conservation of individual species. The geographical coverage comprises virtually all of the world's coastal areas; only the western Canadian Arctic and part of the Antarctic continent are absent. Coupled with the more general chapters discussing different threats to seabirds, this volume represents a major milestone in the assessment of the status of seabirds worldwide and the ordering of priorities for conserving these birds.

In recent years, interest in the scientific study of seabirds has grown rapidly. Likewise, with the advent of new field guides providing worldwide coverage, amateur attention on these birds has expanded. Concomitant with this heightened interest in seabirds has come the realization that a number of species or local populations are declining or threatened with future damage. This book provides the data necessary for pinpointing areas of major concern and frequently supplies useful suggestions for basic research or improved conservation practices.

Of central importance are the geographic treatments. Together they provide an incredibly rich resource. For the first time, assembled in one place, one can determine what species breed where and in what numbers. Although the quality of these treatments is uneven, fortunately many of the least well-known areas of the world have received the most detailed coverage. Maps, species lists, and often population estimates are now available for many remote areas where formerly information was scattered or nonexistent (e.g. Greenland, Indonesia, Iran, and Arabia). For those wishing to study seabirds, these chapters not only provide information on the loacation and composition of colonies, but an introduction to the literature and persons with field experience in each region.

The discussions of local conservation concerns and actions in each of the geographic areas provide useful guidelines for agendas for conservation groups and government agencies. Graduate students and scientists interested in basic research can also profit from

the examination of these needs. Many of the proposed actions lend themselves to combination with basic research. However, the impact of this book may be reduced in places where it is needed most. Only five chapters have summaries in the native language of the region covered by the chapter; the inclusion of native language summaries for all chapters dealing with regions where English is not the official language would have increased the likelihood that the book would stimulate local interest.

The chapters summarizing information on specific threats to seabirds (e.g. predation by introduced animals, human exploitation, competition by commercial fisheries, incidental mortality in gill nets, and habitat reduction) are useful, especially to the extent that they put local problems in a global perspective. Conspicuously missing is a chapter on threats to seabirds from oil and chemical pollution. A global examination of this problem would have been most useful. Additionally, a synthesis comparing the relative importance of various threats, again on a broad scale, would have been helpful. Even though each geographic area clearly has its own unique set of priorities and problems, there is a need for a broader perspective on seabird conservation priorities worldwide.

The extent to which human-caused mortality is added to or substitutes for natural mortality is a question explicitly or indirectly addressed in several of the overview chapters. If natural mortality is density dependent and if natural mortality is reduced to compensate for human-induced mortality, then up to some undetermined level, the mortality caused by humans may have a negligible effect on population processes. But, if human-caused mortality is added to natural mortality, then the population consequences of human-caused mortality are direct and immediate reduction of populations. The critical importance of the effects of threats on the status of populations is clearly stated in the chapter by Moore and Atkinson. Assumptions concerning the likely effect of various levels of mortality on the status of populations are unwarranted given our present lack of knowledge about density-dependence and man-caused mortality (cf. chapter by Feare).

This is an area requiring much additional long-term research. In addressing the potential damage to seabird populations caused by man, the broad regional and global nature of the coverage of this book allows assessment of changes in local bird populations in terms of a broader view. Although individual chapters rarely place local problems in a global context, the reader can do so by combining the information across chapters. As we assess priorities for conservation action, this more global population view will be critical.

The editors of this volume have done a commendable service to marine ornithologists and conservationists. The book is attractively laid out, although chapter numbers on the head of each chapter would have simplified use. The editors' introduction, with a map showing coverage by chapter number and a list of chapters in which each species is covered, is well done and essential for efficient use of the book. This book will be a valuable addition to most ornithological and conservation libraries.—GEORGE L. HUNT, JR.

The atlas of breeding birds of Vermont.—Sarah B. Laughlin and Douglas P. Kibbe (Eds.). 1985. Hanover, New Hampshire, University Press of New England. xx + 478 pp., 179 illustrations, 179 maps, 8 vinyl overlays. ISBN 0-87451-326-X. $45.00.—In an effort to equal, if not surpass, the quality of the widely distributed "Atlas of Breeding Birds in Britain and Ireland," Laughlin, Kibbe, and others have produced an impressive volume that contains the results of 6 years of superbly coordinated fieldwork designed to determine the occurrence and distribution of breeding birds in Vermont. The atlas was a grid-based survey that sampled one-sixth of the state's land area selected as "priority blocks." Each block was one-sixth of a 7.5-min U.S. Geological Survey quadrangle mapping unit, approximately 25 sq km. In addition to 179 priority blocks, 34 areas of unique habitat types were surveyed. Also, reports of breeding birds in any other area of the state, non-priority blocks, were accepted.

The book contains an Introduction, 382 pages of Species Accounts, five Appendixes, References Cited, and an Index of Bird Names. The Introduction includes a thorough discussion of methods used to organize the project and collect field data, and definitions of codes, terms, and abbreviations used throughout the text. These materials should be studied before reading the species accounts. A set of maps outlines several biophysical and land-use features of Vermont, but, unfortunately, not one of the 10 maps of Vermont locates any of the state's 251 towns, although many are referred to in the text. Eight of these maps are duplicated as vinyl overlays and can be superimposed on the distribution map for each breeding bird species.

There are 178 accounts of species confirmed as breeders in Vermont, 14 accounts of birds that probably or possibly breed in the state, and 2 special accounts: a reintroduced species, the Peregrine Falcon (*Falco peregrinus*), and a species confirmed at the last minute, the Great Black-backed Gull (*Larus marinus*). Readers who wish to locate the account of a particular species must use the Index because species accounts are grouped initially by their breeding status, then in taxonomic order, but are not listed in the Table of Contents.

Each account for a confirmed breeding species includes a two-page display of text, a black-and-white sketch of the bird, a distribution map, and a summary

table of the species' distribution by physiographic regions. The text provides a brief discussion of habitat, life history, nesting and migrating chronology, and important findings of the atlas project. Fifteen authors wrote the species accounts, and this variety is reflected in writing styles and content. Some accounts include thorough, up-to-date citations of periodicals while others rely on standard ornithological reference books. However, the editors set high standards for scientific format and style and conform to these standards in the major portion of the text. Common and scientific names are used appropriately, measurements are reported in metric units (followed parenthetically by English units), and literature citations generally are in accepted styles for biological journals.

Distribution maps for each species are most useful and will serve to make this book valuable as a baseline reference. The reader must become accustomed to the maps and summary tables; reading pp. 12–13 first will help. Priority atlas blocks are shown on each map, but the breeding status of the species is indicated for any block in the state, whether a priority block or not. The summary statistics, however, are presented only for priority blocks, and this can be confusing. For instance, the Ring-billed Gull (*Larus delawarensis*) nests in four locations and numbers more than 10,000 breeding pairs, but the summary table shows it to be absent in every physiographic region of the state. This is because none of the priority blocks included breeding sites for this species—a problem whenever randomly located sample plots are used to survey objects that occur in clumped distributions. Biases and limitations of the study are recognized by the editors (pp. 23–24), so readers are cautioned again to read the first chapter before attempting to interpret data presented in the species accounts.

The References Cited section of the book deserves a comment: it is huge—30 pages and about 700 references. I looked for mistakes and inconsistent style and found numerous examples of both. These do not detract from the usefulness of the book, however, and probably will be detected by only a few readers.

"The Atlas of Breeding Birds of Vermont" is a landmark publication—the first North American bird atlas project to reach the press. Others will certainly follow, and it will be interesting to observe the different formats. Let's hope we don't have 50 or more clones of the "Atlas of Breeding Birds in Britain and Ireland" crowding the bookshelves of our libraries. How unexciting it would be to read 50 versions of a species account for the American Robin (*Turdus migratorius*) or the Mallard (*Anas platyrhynchos*). Perhaps some states and provinces will pool their resources and publish regional atlases.

The volume should be useful to those who watch or study birds in Vermont. It should be added to college and university libraries and to bookshelves at appropriate museums and field stations. The book is an important database, contains summaries of thousands of records of Vermont bird sightings, provides useful and readable accounts of 194 species, and sets a standard for future atlas publications.—DAVID E. CAPEN.

OTHER ITEMS OF INTEREST

Penguins of the world: a bibliography.—A. J. Williams, J. Cooper, I. P. Newton, C. M. Phillips, and B. P. Watkins. 1985. Cambridge, England, British Antarctic Survey. xi + 255 pp. ISBN 0-85665-112-5. Cloth. £11.50.—This well-produced and comprehensive bibliographic volume is intended to cover all aspects of the biology of penguins. Standard citations are listed alphabetically by authors' surnames for 1,942 references. Code numbers indicate the taxonomic and subject coverage for each citation. Also provided are taxonomic and subject indices, each 23 pages long.

The taxonomic coding has 17 categories, one for each of the 16 living species of penguins and an additional category for extinct fossil species and references not citing particular species. Subject coding also includes 17 categories, such as aviculture/zoos, behavior, and disease. Numerous additional subject categories might have been used, e.g. geographic regions, body weights, eggs, growth, migration and orientation, to name only a few. Such finer subdivision in the subject categories would have been helpful for users, but would have generated greater bulk and cost for this reasonably priced book.

Those concerned with any aspect of penguin biology or interested in comparing penguins with other birds will want access to this useful volume, which should be included in any comprehensive ornithological library.—GEORGE A. CLARK, JR.

Discovering Sierra birds.—Edward C. Beedy and Stephen L. Granholm. 1985. Yosemite Natural History Assoc. and Sequoia Natural History Assoc. 229 pp., color plates. ISBN 0-939666-42-1. Paper. $9.95.—The authors have attempted to "provide the perfect guidebook." This implies less emphasis on identification and more on the ecology of both the birds and their habitats than in other guides. I cannot recommend this book.

Most species accounts are presented as a sentence or two on some presumably characteristic ecological or behavioral attribute. The information is basic, often simplistic. The text is only valuable at a superficial level. Even the sections on where birds might be found has limited value, as there are no appropriate maps for reference. The major problem is the 41 plates of birds. They are uniformly poor in quality, lack scale and perspective, and suffer from exceptionally poor color reproduction. Many are out of register, or

so dark or murky as to lack detail. Sizes of birds on a plate are frequently distorted, and the postures of many subjects are unnatural.—A.H.B.

Hummingbirds: their life and behavior.—Ester Quesada Tyrell. Photographs by Robert A. Tyrell. 1985. New York, Crown Publishers, Inc. 212 pp., 235 color photos, index. ISBN 0-517-55336-8. $35.00.—The subtitle, "A photographic study of the North American" species, is the best description of this volume. The photographs are a paragon of clarity, excellent color rendition, and detail. The 16 species that breed in the contiguous U.S. are illustrated, with accompanying natural history information. The technical quality of this portfolio of poses is met or exceeded by sequences of nesting and molting, and illustrations of flight, feeding, and selected social behavior. These are certainly the best illustrations of plumage, postures, and behavior associated with personal maintenance and feeding available for hummingbirds.

The text is not of the same quality as the pictures. There are lists of flowers hummingbirds pollinate and of hummingbirds of the world, but there is no significant discussion. The remainder of the text is divided into chapters on anatomy, feathers, flight, courtship and nesting, food and metabolism, and behavior. The diagrams are overly simplified. The text, obviously a labor of love, is superficial. Much of the descriptive material is a series of single-sentence paragraphs that read like the 1,000 most amazing facts about hummingbirds. The tone varies from chatty to gee-whiz. There are too many generalities, consistent lack of documentation, and too many changes of direction, interruptions, and gratuitous facts to make for easy progress. The reader is presented with a fact or a statement and rushed breathlessly on to another item. There is no time to reflect on the significance of most of the information. The author's enthusiasm is overwhelming.—A.H.B.

DATE OF ISSUE (Vol. 103, No. 2): 11 April 1986