

sensus from the relevant scientific community.

My generation learned the evidentiary basis for population genetics almost exclusively from *Drosophila* and for quantitative genetics from laboratory mice and agricultural animals. This book features a wonderful variety of examples, including condors (*Gymnogyps californianus*), elephant seals (*Mirounga angustirostris*), fish, wolves (*Canis lupus*), gazelles (*Gazella* spp.), pumas (*Felis concolor*), tamarins (*Leontopithecus rosalia*), butterflies, and a variety of plants. It is rare to see a book on population genetics where plants get nearly as much attention they do here. Some of these species have been studied in detail so that examples can be followed and used as illustrations through several topics. For example, dwarfism in condors is used to illustrate Hardy-Weinberg calculations, single-locus selection, and managed inbreeding avoidance. The hairy-nosed wombat (*Lasiorhinus latifrons*) is used to calculate loss of genetic diversity with small population size, to estimate effective population size, to survey with molecular methods, and to resolve questions about the genetic uniqueness of populations. The rich variety of examples described in this book cannot help but stimulate interest and bring enthusiasm to new generations of students.

In the final third of the book the authors take up separate issues that are of greater importance to conservation genetics than to population or quantitative genetics generally. These include resolving questions of genetic uniqueness and taxonomic status, molecular forensics to identify alleged hunting or collecting, and management of wild or captive populations. So much bluster and smoke has been generated by the question of what distinguishes species that I, at least, have usually been content to present the difficult issues to students but take no position myself. In conservation genetics that luxury is not allowed. It is absolutely critical to have clear and agreed-

upon criteria for differentiating populations and assigning them an objective taxonomic status. The sensible review of ideas about species criteria presented here in table format is especially welcome. There are also nice tabular reviews of population bottlenecks, inbreeding depression, effective population size, and case studies for evaluating management options.

The overall message is one of serious concern, not despair. The goal is to engender appreciation for the problems of threatened and endangered species and to help development of practical management tools. It is encouraging to learn that there have been times when knowledge of conservation genetics did help solve problems. An example is the use of molecular markers to determine that some superficially distinct populations of pumas are not very distinct genetically so that introductions from other sites will not introduce harmful hybrid sterility, but will instead help reduce the frequency of homozygote recessive mutants and alleviate inbreeding depression generally.

*Introduction to Conservation Genetics* is an important book; it has authoritative reviews and lucid descriptions of population and quantitative genetics. It is beautifully put together and illustrated (with line drawings by Karina McInness). The authors aspired to write another *Falconer's Quantitative Genetics*, which inspired and taught several generations. They have accomplished that admirably.

Much in population genetics is contentious. The authors sometimes take stronger stands than seem warranted by current knowledge, but as new techniques become available and the evidentiary basis grows it will be possible to fortify some of the issues presented here with new examples and to revise positions on others. Overall, this book is a fine account of the field. Conservation genetics is important and growing more so. I anticipate that this book

and its successors will be the standard text and reference for years to come.

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## State-of-the-Art Conservation Literature

**Conserving Bird Biodiversity: General Principles and their Application.** Norris, K., and D. J. Pain, editors. 2002. Cambridge University Press, New York. Conservation Biology Series 7. 350 pp. \$100.000 (hardcover). ISBN 0-521-78340-2. \$38.00 (paperback). ISBN 0-521-78949-4.

*Conserving Bird Biodiversity* is the seventh volume in Cambridge University Press's series on conservation biology. Most of the previous volumes in the series have addressed general themes such as the genetics, demography, and viability of fragmented populations, behavior and conservation, or the conservation of exploited species. Because conservation biology is intrinsically such a broad and interdisciplinary field, the challenge is to narrow the scope to highlight specific concepts and applications in sufficient depth. This book achieves that by concentrating on a single taxon, birds. Birds are a particularly effective focus because, compared with other groups of animals and plants, so much is already known about their phylogenetic relationships, distribution, abundance, and ecology, and because of the role they can play as flagship and umbrella species.

Edited by Ken Norris (University of Reading) and Deborah J. Pain (Royal Society for the Protection of Birds), the book consists of 12 chapters on carefully selected topics authored by specialists. The topics follow the general organization of a conserva-

tion biology textbook, with introductory chapters defining biodiversity, marshaling the arguments for protecting species, and discussing biological and political strategies for safeguarding critical habitats. However, this is not merely a rehash of familiar material. Several features make this book especially valuable for students in applied ecology, for professional ornithologists, and for managers and decision-makers concerned with protecting bird populations.

The book's main aim is to draw explicit connections between general principles and specific problems of avian conservation. The editors set out to determine what sort of research and monitoring skills are needed and how these can be transferred to the people who need them. A repeated theme is the importance of learning how to pose appropriate questions and design projects that will result in effective conservation action. Given that there are more than 9000 species of birds occupying virtually every habitat on Earth and that their conservation problems must be addressed in the context of distinct ecological, political, and economic situations, this book makes no attempt to propose one-size-fits-all solutions. Yet it also does not stop at vague generalities. Decision-makers and wildlife biologists will find conceptual tools and diverse examples of how they have been and might be applied in the real world.

The editors have done an excellent job of minimizing overlap between chapters. The book proceeds logically and smoothly as it builds a thorough picture of avian conservation biology. There are relatively few figures and tables, but the clear writing and systematic organization of the text make the information easily accessible. The literature citations are exceptionally rich and recent—there are nearly 1000 references, about one-third of which were published after 1998. Most of the book's 19 authors hail from the United Kingdom (11) or its former Old World

colonies (5); only two are from west of the Atlantic, two are from the Netherlands, and none are from Asia. As a result, readers from North America and Latin America will find their perspectives expanded by the emphasis on case studies from Africa, Australia, and New Zealand. A shortcoming of the Old World emphasis is that insufficient attention is paid to conservation issues of Central and South America, the regions with the greatest avian species richness in the world. Voices of ornithologists from developing countries are also largely unrepresented. The sole exception is Bennun's plea from Kenya to build capacity by involving local students in research projects ("The Interface Between Research, Education and Training"), although he missed an opportunity to make that plea more convincing by including an African student as co-author.

Most of the chapters summarize in detail what is known about particular aspects of avian conservation without attempting to present novel empirical or theoretical research. Overviews of such topics as "Mapping and Monitoring Bird Populations" (Underhill & Gibbons) and "Avian Conservation Policies and Programmes" (Boere & Rubec) pull together information from disparate literature sources, including unpublished governmental private reports, which would otherwise be difficult to access. They also remind us of the debt we owe to nongovernmental organizations, such as Partners in Flight, BirdLife International, and the Royal Society for the Protection of Birds, for their tireless and creative work to save bird populations and their habitats. Mace and Collar ("Priority-Setting in Species Conservation") discuss how hard decisions are made in the real world and make a plea for establishing consensus among conservation organizations and agencies about criteria and rules for establishing priorities for protecting species and habitats. Balmford ("Selecting Sites for Conservation") presents an effective il-

lustration of the benefits of using rarity-based complementarity algorithms in choosing sites to protect and cautions against assuming that the geographical distribution of biodiversity is congruent between birds and other taxa. Pain and Donald ("Outside the Reserve: Pandemic Threats to Bird Biodiversity") make the point that although conservation action is most effective at local scales, the global context and long-term perspectives are also critical. Norris and Stillman ("Predicting the Impact of Environmental Change") and Green ("Diagnosing Causes of Population Declines and Selecting Remedial Action") explore the value and shortcomings of demographic and behavior-based models and population viability analysis in the face of uncertainty and incomplete biological information.

This book covers so much ground that it would be ideal as the centerpiece for a semester-long course in conservation biology for graduate students or advanced undergraduates, supplemented by selected readings from the primary literature. Bell and Merton's chapter, "Critically Endangered Bird Populations and Their Management," could by itself provide the structure for a seminar on managing endangered birds. Case histories of six distinct species are summarized in boxes that describe causes of declines, local and global population trends, management approaches, and future threats.

One of Bell and Merton's case histories illustrates why New Zealand conservation biologists are leaders in the close-order management of endangered birds. The Kakapo (*Strigops habroptilus*), a flightless parrot, has been inching its way toward extinction because of introduced mammalian predators (chiefly cats, stoats, and rats), competing herbivores, habitat loss, and commercial collecting. After the last remaining natural population of Kakapos was translocated to three cat-free islands, adult mortality declined to <2% per year. The population appeared to

stabilize once breeding females were provided supplementary food, individual nests were protected from rats, and nests and birds were intensely monitored with radiotransmitters, automatic scales, predator alarm systems, and infrared video cameras. Alarming, however, none of the aging females laid eggs between 1998 and 2001. Speculating that breeding was triggered by mast-fruit-

ing of rimu (*Dacrydium cypressinum*), wildlife biologists transferred all adult females to an island where the trees were in fruit and a massive campaign had eradicated rats and possums. The gamble paid off: as of 2002, the 21 surviving females had laid 47 eggs.

The editors, authors, and publishers of *Conserving Bird Biodiversity* are to be commended for their syn-

thesis of the state of the art of avian conservation biology. I hope this book will serve as a model for future taxon-specific works on the conservation of amphibians, fishes, insects, and other animals and plants.

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### Recently Received Books July 2002 to April 2003

**Arthropods of Tropical Forests: Spatio-Temporal Dynamics and Resource Use in the Canopy.** 2003. Basset, Y., V. Novotny, S. Miller, and R. Kitching, editors. 2003. Cambridge University Press, New York. \$100.00. ISBN 0-521-82000-6.

**Bureaucratic Landscapes: Interagency Cooperation and the Preservation of Biodiversity.** Thomas, C. W. 2003. The MIT Press, Cambridge, MA. 375 pp. \$27.95 (paperback). ISBN 0-262-70089-1.

**The Economics of Marine Resources and Conservation Policy: the Pacific Halibut Case Study with Commentary.** Crutchfield, J. A., and A. Zellner, editors. 2003. The Univer-

sity of Chicago Press, Chicago. 238 pp. \$60.00. ISBN 0-226-12194-1.

**Emerson's Life in Science: the Culture of Truth.** Dassow Walls, L. 2003. Cornell University Press, Ithaca, New York. 288 pp. \$35.00. ISBN 0-8014-4044-0.

**Feral Future: the Untold Story of Australia's Exotic Invaders.** Low, T. 2003. The University of Chicago Press, Chicago. 425 pp. \$35.00 ISBN 0-226-49419-5.

**From Conquest to Conservation: Our Public Lands Legacy.** Dombeck, M. P., C. A. Wood, and J. E. Williams. 2003. Island Press, Washington, D.C. 224 pp. \$40.00 (hardcover). ISBN 1-55963-955-5. \$22.50 (paperback) ISBN 1-55963-956-3.

**The Global Environment and International Law.** DiMento, J. F. C. 2003. University of Texas

Press, Austin. 236 pp. \$21.95 (paperback). ISBN 0-292-71624-9.

**Primary Succession and Ecosystem Rehabilitation.** Walker, L. R., and R. del Moral. 2003. Cambridge University Press, New York. 455 pp. \$130.00 (hardcover). ISBN 0-521-80076-5. \$50.00 (paperback). ISBN 0-521-52954-9.

**Reproduction Science and Integrated Conservation.** Holt, W. V., A. R. Pickard, J. Rodger, and D. E. Wildt, editors. 2003. Conservation Biology Series No. 8. Cambridge University Press, New York. \$110.00 (hardcover). ISBN 0-521-81215-1. \$40.00 (paperback). ISBN 0-521-01110-8.

**Still the Wild River Runs: Congress, the Sierra Club, and the Fight to Save the Grand Canyon.** Pearson, B. 2002. The University of Arizona Press, Tucson. 250 pp. \$45.00. ISBN 0-8165-2058-5.

