

inconsistent in that only some of the species names are listed as a left header, whilst the right header sometimes has to have two families (e.g., p. 28, where the right header is “Bufonidae, Ranidae” and the left header is “*Rana saharica*”). Only the family should have been presented on either page. Where sections are crossed, this is even worse (e.g., pp. 46–47). These editorial problems detract from the otherwise high quality reproduction of the book.

Most of the criticisms mentioned above are not unique to this book and should not dissuade the reader from obtaining a copy. This volume is a worthwhile addition to the libraries of all those interested in African herpetology.

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CONSERVATION AND THE GENETICS OF POPULATIONS. Fred W. Allendorf and Gordon Luikart. 2006. Blackwell Publishing, Malden, Massachusetts. ISBN 1-4051-2145-9. 642 p. \$69.95 (softcover).—To truly appreciate the magnitude of what Allendorf and Luikart have accomplished with their recent publication of *Conservation and the Genetics of Populations*, it is necessary to consider just how far the field of biology has come in the last 70 years. While Darwin's (1859) seminal work provided the theoretical context to understand patterns of species diversity and examples of adaptation, it wasn't until 1937, when Dobzhansky published *Genetics and the Origin of Species*, that the synthesis of Mendelian genetics and systematics provided biologists with their first insights into the evolutionary processes that operate on genetic

variation within natural populations to generate new species. Over the next decade, the fields of botany, zoology, paleontology, and systematics were fully integrated into a comprehensive view of the evolutionary process commonly referred to as the “modern synthesis” (Mayr and Provine, 1980). More recently, advances in molecular genetics have led to a renaissance in developmental biology and studies of “evo-devo:” a field that has dramatically increased our appreciation of the connection between genotype and phenotype (Carroll, 2005). Almost coincidentally, it was Aldo Leopold (1949) who first drew our attention to the impact that human actions have on natural ecosystems just when this clearer understanding of speciation was beginning to emerge.

While the intellectual origin of conservation genetics can be traced to Otto Frankel's (1974) landmark paper, *Genetic conservation: our evolutionary responsibility*, the field as a whole really has only emerged as a cohesive discipline in the last ten years. Conservation genetics is, by nature, a highly interdisciplinary and synthetic field that weaves together ecology, molecular biology, population genetics, and mathematical modeling within the broader framework of conservation biology. As both a basic and applied science it lies at the interface of research and management, requiring a daunting breadth and depth of knowledge in many sub-disciplines to practice effectively. This, more than anything else, makes *Conservation and the Genetics of Populations* such an impressive accomplishment. Allendorf and Luikart provide a thorough conceptual basis for understanding the genetics of biological problems in conservation. While the intended audience is broadly trained biologists, including advanced undergraduate and graduate students, the book will prove a ready reference for almost anyone interested in understanding the basic principles of conservation genetics.

The book itself is divided into three sections: Part I—*Introduction*, Part II—*Mechanisms of Evolutionary Change*, and Part III—*Genetics and Conservation*. The first section of the book (chapters 1–4) discusses what should be conserved (genetic diversity, phylogenetic diversity, species, populations, ecosystems, etc.), how we should conserve these units, and how genetics can be applied to conservation. This section of the book also does a good job of outlining examples of phenotypic and genetic variation in natural populations, including an overview of the various types of molecular markers commonly employed for conservation genetic studies. The middle third of the book (chapters 5–12) covers the same material typically found in most population genetics text, such as Hartl and Clark (2006).

The strength here lies in the clear connection the authors draw between each of these evolutionary forces (e.g., drift, selection, mutation) and their impact on small or threatened populations. The “guest boxes” at the end of each chapter authored by experts in the field, in particular, do a nice job of connecting theoretical content with applied problems in conservation biology. Overall, this section of the book provides a well-balanced overview of modern population genetics and clearly provides the intellectual tools needed to appreciate the material in the last section of the book, *Genetics and Conservation* (chapters 13–20). Here the authors cover the suite of challenges facing small populations in nature: inbreeding depression, minimum viable population size and extinction, population fragmentation, hybridization, invasive species, etc.

In addition to the “guest boxes,” which provide direct connections to the primary literature by an impressive list of authors, Allendorf and Luikart provide relevant and challenging problem sets at the end of each chapter. The text is peppered with pertinent quotes, excellent case studies, and the figures and tables are clear and easy to interpret. The coverage of recent literature is truly impressive, almost Herculean in scope. They also provide a glossary of important terminology and a list of symbols used in the text. Finally, the authors include an indexed appendix covering: *Probability, Statistical measures and distributions, Frequentist hypothesis testing, Maximum likelihood, Bayesian approaches and Markov chain Monte Carlo (MCMC) simulations, Approximate Bayesian computation, Parameter estimation, Performance testing, and an overview of the Coalescent and genealogical inference.*

Indeed, Allendorf and Luikart have done a fantastic job of organizing and synthesizing an incredibly broad body of knowledge, and the text will undoubtedly serve as excellent reference for academics, wildlife managers, and policy makers for the foreseeable future. My only criticism of the book as a whole is the placement of chapter 16 (*Units of Conservation*), which finally introduces taxonomy, systematics, and phylogeny reconstruction nearly 400 pages into the text. This is not a major limitation for those interested in using the book in an academic course but it should, perhaps, be mentioned that the coverage of phylogenetics (presumably one of the most important areas of conservation research) receives only limited attention. However, many other texts covering this material are readily available (e.g., Page and Holmes, 1998). In short, *Conservation and the Genetics of Populations* is a grand achievement and should be on the shelf

of everyone interested in the future of biodiversity.

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REEF AND SHORE FISHES OF THE HAWAIIAN ISLANDS. John E. Randall. 2007. Sea Grant College Program, University of Hawai'i, Honolulu. ISBN 1-929054-03-3. 560 p. \$125.00 (hard cover).—After 47 years there finally is a new comprehensive book on the fishes of the Hawaiian Islands. Since the publication of the W. A. Gosline and Vernon E. Brock book *Handbook of Hawaiian Fishes* in 1960, that publication has been the only one available to aid in the identification of the fishes of the Hawaiian Islands. It contained keys to the species and a few black and white drawings. Much later (1996), Randall published his *Shore Fishes of Hawai'i*, a small, paper-bound handbook with color photographs of the more common species and short descriptions of each, but there were no keys. This book was aimed more at snorkelers, divers, and tourists visiting the islands. Having taught ichthyology at the University of Hawai'i for 16 years, I and my predecessors supplemented Gosline and Brock with mimeographed (if you are old enough to remember those) and Xerox copies of various keys to the different fish