Book Review

Introduction to Conservation Genetics


Alec R. Lindsay
Department of Biology, Northern Michigan University, Marquette, MI 49855
(906) 227-1834; alindsay@nmu.edu

Abstract
Introduction to Conservation Genetics written by R. Frankham, J.D. Ballou, and D.A. Briscoe, is a comprehensive introductory text that provides an enlightening synthesis of data and theory from ecology, population genetics, evolution, and conservation biology. The book focuses on the science of conservation genetics and is appealing in its general lack of overt advocacy, while the final section provides meaningful applications to practical problems in conservation. Important concepts outlined in the text are emphasized by case-studies taken from primary literature, and chapters are concluded with a summary followed by exercises or problems. Beginning and seasoned researchers alike will benefit from a reference copy on their shelves.

Introducción a la Genética de la Conservación

Resumen. Introduction to Conservation Genetics (Introducción a la Genética de la Conservación) escrito por R. Frankham, J.D. Ballou y D. A. Briscoe es un exhaustivo texto introductorio que provee una síntesis esclarecedora de datos y teoría sobre temas de ecología, genética de poblaciones, evolución y biología de la conservación. El libro se enfoca en la ciencia de la genética de la conservación y es atractivo debido a que carece de una evidente apología, mientras que la sección final provee de aplicaciones importantes para problemas prácticos relacionados a la conservación. Conceptos importantes esbozados en el texto son enfatizados usando situaciones reales tomadas de la literatura considerada primordial sobre el tema, y los capítulos son concluidos con un resumen, seguido de ejercicios o problemas. Tanto principiantes como investigadores experimentados se beneficiarán de tener una copia como libro de referencia en sus estantes.

L'introduction à la Génétique de Conservation

Résumé. Introduction to Conservation Genetics (L'introduction à la génétique de conservation) écrite par R. Frankham, J.D. Ballou, et D.A. Briscoe est un texte d'introduction complet qui fournit une synthèse instructive des données et de la théorie de l'écologie, de la génétique de population, de l'évolution, et de la biologie de conservation. Le livre se concentre sur la science de la conservation génétique et il est attirant dans son manque général de recommandation manifeste, alors que la section finale fournit des applications significatives aux problèmes pratiques dans la conservation. Des études de cas tirées de la littérature primaire soulignent les concepts importants décrits dans le texte, et chaque chapitre se termine par un résumé suivi d'exercices ou de problèmes. Chercheurs chevronnés aussi bien qu'inexpérimentés tireront avantage d'une copie de référence sur leurs étagères.
The scientific fields of conservation and genetics have enjoyed decades of productive and innovative research and subsequently have provided many influential insights to the scientific community. In recent years, science and society alike have both benefited from the nexus of these two lines of research, and Conservation Genetics has left the nascent status of a "cross-disciplinary" field to blossom into its own discipline, rich with both theory and data. That being the case, it is surprising that only in this year has a comprehensive introductory text been published on the subject: Introduction to Conservation Genetics (henceforth referred to as "ICN") written by R. Frankham, J.D. Ballou, and D.A. Briscoe, and published by Cambridge University Press in 2002.

This book, written expressly for advanced undergraduate and graduate students, follows an accessible and logical format despite dealing with a field that draws on data and theory from several seemingly disparate sub-disciplines such as ecology, population genetics, evolution, and conservation biology. After two introductory chapters reviewing the scope and aim of conservation genetics writ large, the authors divide the remaining 18 chapters into three main sections: Evolutionary Genetics of Natural Populations; Effects of Population Size Reduction; and From Theory to Practice. In typical textbook format, most of the important concepts outlined in the text itself are further emphasized with boxed "real world" case-studies taken directly from primary research. Chapters are concluded with helpful summaries of main points and followed by a series of exercises or problems. Problem sets (and some examples woven into the text) may in some cases provide readers with meaningful hypothetical applications for different formulae, and in other cases direct attention to some theoretical or even ethical concerns covered in the chapter. The organization of the text may be useful in generating classroom assignments or discussion topics, but advanced students (or researchers) may consider some sections unnecessary review, having covered similar material in prerequisite genetics and ecology courses. Apart from that caveat, this text has a reasonable blend of introduction and detail which should appeal to intellects at various levels.

Although the first two chapters and the final section of the book have a significant emphasis on the importance of conservation issues impinging upon global biodiversity, the book is appealing in its general lack of overt statements of advocacy and the absence of proselytizing to the reader. The authors instead focus much of the text specifically on the science of conservation genetics, rather than the mission of conservation biology. In fact, more than the first third of the book is spent detailing the direct applicability of evolutionary theory and population genetics to issues related to the conservation of biodiversity. Some readers may find these lengthy descriptions remedial, but most conservationists undoubtedly will find this a refreshing exposé of topics in evolution and population genetics that are too often left as a "black-box" when trying to confront conservation issues. The coverage of this material is easy to read and peppered with examples from the conservation literature, making these concepts more accessible to a wider audience. Given the now well-recognized importance of genetic data in conservation studies (e.g., recommendations by the World Conservation Union), the first section of ICN may well provide even experienced conservation biologists a needed springboard for gaining a foothold in this area of research.

The final section of ICN provides a meaningful application of many concepts covered in the initial two sections to practical problems confronting conservation biologists today. There are chapters discussing genetic management of captive and wild populations, genetic management for potential reintroduction programs, the use of molecular genetics in forensics and the use of genetic data in population viability analyses. Like earlier sections, the case-study examples cited in this section are helpful, germane and recent. ICN does use several botanical examples throughout the text and makes a fair discussion of the complications floral polyploidy and hybridization bring to species concepts in plants, as well as the associated conservation implications of which students and researchers should be aware. However, conservation biologists keenly attuned to the loss of botanical biodiversity may find the text significantly biased toward zoological examples. This is perhaps not a shortcoming of ICN, nor likely due to a lack of concern on the parts of its authors, as much as it is a reflection of the general bias toward studies of charismatic megafauna in conservation biology.

Although deep in its scope, researchers considering ICN should not hope for a manual on techniques or procedures used in conservation genetics. There are general and helpful discussions of the applicability of different molecular genetic markers to various conservation questions, but there is little in the way of specific descriptions of protocols or experimental design. Also conspicuously missing is any meaningful discussion of the roles different computer programs play in analyzing molecular genetic data. These were likely conscious oversights by the authors, as they instead provide adequate references to recent and relevant literature on these subjects. In fact, the omis-
tion of detailed discussions on the particulars of conducting conservation genetic research may well be a strength rather than a shortcoming of this text, as ICN will perhaps have longer staying-power before significant portions become outdated and in need of revision.

Perhaps the largest challenge for an introductory text on conservation genetics is to present original material that is more than a simple compilation of relevant theory from the fields of ecology, conservation, population genetics and evolution. In many regards, ICN overcomes this potential pitfall without much contrivance, and those sections which draw heavily from these related fields are enlightening syntheses rather than review or reiteration. Previously published texts on the shelves of conservation geneticists are likely to be edited volumes of chapters contributed by active researchers (e.g., Avise and Hambrick 1996; Smith and Wayne 1996; Carvalho 1998). Although useful for peers who are already well-versed in the theory and vocabulary of conservation genetics, these edited texts are often too dense or esoteric for beginning students or colleagues in other disciplines who wish to gain a more detailed understanding of this emerging field. ICN fills this gap in the conservation genetic literature, providing necessary introductory material for the uninitiated, considerable coverage of case studies which exemplify various concepts covered in the text, and a broad integration of theory from the fields of evolution, population genetics, ecology and wildlife management – the greenhorn and the seasoned researcher alike will benefit from a reference copy on their shelves.

**Literature cited**


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