ENVIRONMENT

Essentials of Conservation Biology (Fifth Edition)

By Richard B. Primack. 2010. Sinauer Associates, Inc., 23 Plumtree Road, Sunderland, Massachusetts, 01375 USA. 538 pages. 86.95 USD.

Richard Primack's textbook has long provided a comprehensive introduction to the major concepts and problems facing the ever-changing field of conservation biology. This fifth edition, which coincides with the United Nations' International Year of Biodiversity, continues to serve as a detailed guide for students and professionals. In addition to updated full-colour illustrations and detailed photographs, summary statements of major points have been added to the text margins, to provide useful study aids for students of the subject. *Essentials of Conservation Biology* is also highly useful as a supplemental text for students of general biology, ecology, wildlife biology and environmental policy courses.

In the preface, Primack himself acknowledges the increase in public interest and awareness of conservation issues, and the subsequent emergence of conservation biology as a scientific discipline. In updating *Essentials* he has placed an emphasis on the role that scientists, the general public, governments and conservation organizations must play in addressing the loss of biodiversity. He draws from biological theory, in addition to applied research, in order to explain the connections between education, law, social sciences and the rapidly advancing area of environmental economics. The very latest advances in biological knowledge are combined with information regarding new practical approaches to conservation. The text presents all of this information in a clear, non-technical language that will not confuse newcomers to biology, without patronizing the biological and environmental professionals to whom the book is also directed.

Essentials is separated into five main parts; each addressing different aspects and approaches to the discipline. The first part starts at the beginning: by establishing the meaning of conservation biology and how this relatively new discipline emerged as a science. Key ecological ideas relating to biological diversity are subsequently presented, such as succession and species interactions. He also describes the main levels at which biological diversity can occur: species, genetic and ecosystem. These chapters are particularly useful in fulfilling the author's objective of providing a text to complement other areas of natural science. They also provide an excellent foundation for non-biologists interested in conservation.

The next part deals with putting a value on biological diversity. Given the necessity to obtain funding, backing and support in order to propel conservation work, putting a comparable value on our existing wildlife and habitats in becoming all the more important. Biologists such as myself, often need guidance and simple explanations of how to utilize the blossoming field of ecological economics, and Primack certainly provides this. Direct use values, indirect use values and ethical values are explained, supported by highly relevant case studies.

Part III, detailing the threats to biological diversity, puts the "current, human-caused mass extinction" into context by comparing current extinction rates with past mass extinctions. Vulnerability to extinction is explained within the contexts of endemic species and designated conservation categories. The text then goes on look at habitat destruction, fragmentation and degradation, by examining the causes and effects of these actions. The effects of global climate change are also described, with particular reference to the effects upon plants, sea levels and water temperatures. This often contentious topic, which has a tendency in recent years to overshadow other environmental issues in the media, and scientific literature is discussed in an admirable manner; presenting the evidence and concentrating on the potentially devastating effects upon biological diversity. This part of the book is completed by looking at overexploitation of natural resources, the impacts of invasive species and the effects of disease.

Population and species level conservation is discussed in Part IV. Again the format of presenting the problems, followed by the potential and current solutions, is employed. Issues facing small populations are described, utilizing rhino species of Asia and Africa as a poignant case study, and making links with the threats to biodiversity discussed in the previous sections. A chapter examining applied population biology leads on nicely to the next, which deals with establishing new populations. The final chapter in this section looks at ex-situ conservation strategies, again providing examples highlighting how conservation biology is currently being used.

The penultimate part investigates further practical applications, but at the habitat and ecosystem levels. The ecology behind protected areas, reserve design and habitat connectivity is clearly presented. Primack goes on to talk about managing protected areas, in addition to conservation outside reserves, such as in urban and agricultural areas. The text continues to embrace conservation as a modern discipline by looking at the emerging area of restoration ecology. Dealing with a particular interest of mine, the author has done well in explaining how ecological principles can be applied to projects that are restoring and improving land which has been degraded, often by human activity.

The final section does an excellent job of detailing the role of human societies in conserving biological

diversity. The functions of legislation, agreements and funding sources are all discussed. These are often alien topics to even the most well-read of natural science students, and the author does well to link their uses to the activities discussed previously in the book. Finally, an agenda for the future is presented, reinforcing the ongoing problems and possible solutions, whilst describing the role that conservation biologists have to play in all this.

Essentials of Conservation Biology provides everything you could want from a textbook on the subject. Descriptions are clear and unpretentious, and the language is suitable for people from all backgrounds. Full-colour photographs and illustrations complement the text, whilst graphs and tables clearly show useful data. The text covers a variety of topics, providing an excellent background for non-biologists. Summary and discussion points at the end of each chapter provide direct conclusions, in addition to areas for debate. Well chosen case-studies add substance to the text and help to prove that conservation biology is very much a practical science, based upon basic ecological theories. Primack himself encourages a hands-on approach for aspiring conservationists and advises readers to make contact with organizations that he references in the Appendix.

The author claims that he has intended to provide the reader with "a greater appreciation of the goals, methods and importance of conservation biology". I feel that he has certainly done this and more, in a clear and detailed manner.

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The Game of Conservation – International Treaties to Protect the World's Migratory Animals

By Mark Cioc. 2009. Ohio University Press, 88 University Terrace, Scott Quadrangle, Athens, Ohio 45701. 267 pages. 24.95 USD.

Migration is one of the great wonders of the natural world. One important thing uniting all migratory species is the fight to survive. Migration as a large-scale movement enables animal populations to spend their life in two or more different areas, usually because lack of food makes them impossible to stay in the same place. Other reasons for animals migrating might be to find essential minerals, shelter or to avoid harsh winter weather, to search for a mate, to give birth, lay eggs or raise young, to moult in a safe place, or to flee overcrowded conditions, and so on. Migratory species are in many ways more vulnerable as they use multiple habitats and sites and a wide suite of resources throughout their migratory cycle. The growing array of threats faced by them may include habitat destruction or fragmentation, overexploitation, forcing changes in migration routes, disrupting food sources, affecting nesting and breeding habits and increasing susceptibility to diseases, and global climate change will tend to impose further threats. The decline of migratory species is by no means a new problem. Saving the great migrations will be one of the most difficult conservation challenges of the 21st century, but failing to do so timely will cost heavily, ecologically and even economically.

To carry out conservation, measures such as maintaining a coherent network of stopover sites, creating and expanding suitable habitat and developing and sustaining trans-boundary corridors that allow species to migrate as the environmental changes should be taken. However, protecting animal migrations has been very unsuccessful since that conserving migratory animals poses some unique challenges, one of which is the efficient international coordination for such conservation.

Migration over long distances means crossing many international borders and entering different political areas with their own environmental policies, legislation and conservation measures. Thus, the management of migratory species with a multinational home-range need efficient international cooperation between governments, NGOs and other stakeholders along the whole route of a species to share knowledge and to coordinate conservation efforts. This is especially true for the endangered animal species, with so few individual survivors that the species could soon become extinct over all or most of its natural range, and for the threatened species, still abundant in their natural range but declining in numbers and likely to become endangered.

Traditionally, legislation on wildlife focussed on protected areas and hunting restrictions (e.g., protection of listed species), and has rarely adopted a comprehensive approach to wildlife management. Twentieth-century nature conservation treaties often originated as attempts to regulate the pace of killing rather than as attempts to protect animal habitat. All of these treaties are still in effect today, and all continue to influence nature-protection efforts around the globe. The treaties had many defects, yet they also served the goal of conservation to good effect, often saving key species from complete extermination and sometimes keeping the population numbers at viable levels. Recent wildlife laws contain important innovations.

The recently published book of The Game of Conservation is a readable examination of nature protection around the world. It introduces the handful of treaties (all designed to protect the world's most commercially important migratory species) that have largely shaped the contours of global nature conservation over the past