

## BOOK REVIEW

***Conservation Biology: Foundations, Concepts, Applications*** Fred Van Dyke. 2003. McGraw-Hill, Boston, MA, 412 Pages, \$81.25, ISBN 0-07239-770-5 (softbound), and ***A Workbook in Conservation Biology: Solving Practical Problems in Conservation*** (with Contributing Authors), 192 Pages, \$22.25, ISBN 00724-386-81 (softbound).

*Conservation is ethically sound. It is rooted in our love of the land, our respect for the rights of others, our devotion to the rule of law.*

—Lyndon Baines Johnson

Fred Van Dyke's new textbook, *Conservation Biology: Foundations, Concepts, Applications*, offers a view of conservation biology that weaves together three strands to make a whole including foundations, concepts, and applications that look into the past, present, and future. Students get a background into the history, theory, and practical solutions of conservation biology. This 3-fold approach gives the book a unique position in the suite of excellent conservation biology textbooks already available (Primack 2003).

Conservation biology is based not just on a drive to understand the natural world but, as Van Dyke argues, on values such as the idea that biodiversity is good and we should protect it. Conservation biology also depends on the idea that ethical problems need solutions, e.g., that biodiversity is declining and we need to protect it. As a group, conservation biologists accept these ideas, sometimes without knowing clearly how they came to believe them. To understand conservation biology as a discipline, students

should begin first with the foundations of the discipline, including the history, values, and ethics, that drive many scientists to do conservation work. Van Dyke does an admirable job of writing a text that enables students to think about the basis of conservation biology, apply scientific concepts, and see themselves as part of the future of the discipline.

Foundations (the past) is covered in Part I of the text. Five chapters cover conservation biology, biodiversity loss, the values underlying conservation, basics of biodiversity measurement, and the history of the science. In this section, the most notable features are a discussion on why conservation biology is not simply a subset of some other discipline and an in-depth discussion on a wide range of ethical traditions that lead to the protection of biodiversity.

Concepts (the present) includes a discussion on ecological theory through practical applications of the conservation of populations, genetic diversity, habitats, aquatic systems, and ecosystem management. Van Dyke, a professor at Wheaton College in Illinois, has a research background and experience in the management of successional processes for habitat conservation and wildlife home range conservation. He has also written on conservation ethics. This landscape-level research interest may be the reason Van Dyke arranged this central conceptual and scientific portion of the text so that students progress through material on populations and genetics to large-scale processes and management of whole ecosystems.

Applications (the future) is represented by five final chapters covering restoration ecology, economics, and sustainable development, with the final chapter on professional direction and professions in the field of conservation. The chapter on restoration ecology covers restoration of various types of habitats such

as grasslands, forests, wetlands, and streams. Two of the major examples are of restoration of stream habitats for salmon species and the Florida Everglades. Restoration ecologists might be interested in the examples of compositional and functional approaches to restoration ecology. These two approaches emphasize either restoring particular species or simply restoring ecosystem function. Van Dyke's examples of possible restoration techniques cover both these approaches.

The chapter on Professional Effectiveness and Future Directions in Conservation Biology (Chapter 13) is a unique and fascinating approach to giving students the tools they need to become a part of the solution to conservation problems. Students are given information on several directions they could pursue in conservation biology and examples of students who chose different career paths. Van Dyke also describes the process of forming collegial relationships and networking as integral to being part of the scientific community. He discusses taking the GRE, finding a graduate program, excelling in a job, and following trends in conservation ecology.

Designed for use in an upper-level undergraduate course, the book comes with an accompanying workbook and access to a Web site where programs, practice quizzes, animations, case studies, and data are available. Each chapter in the text also has web resources that can be accessed from the textbook's Web site. The workbook included information on fundamental skills for students that I was pleased to see. The exercises on literature searching, abstract writing, and evaluating a scientific paper were so useful that I would like to devise a way to use them or something similar in my nonconservation biology courses. The remaining lab activities were focused on five areas: conservation and economics, genetic conservation,

conservation in a landscape context, population viability analysis, and integrative habitat assessment. Each of the areas had subparts and could be used in a lab or as a series of in-class activities.

Two other features of the book are noteworthy. One feature is the emphasis on process in learning and a de-emphasis on facts and case studies by themselves; the other feature of the book is its readability. The emphasis on process gives the book an interdisciplinary flavor in which students engage each concept on a number of levels (Neisenbaum and Lewis 2003). Throughout each chapter are "Points of Engagement," questions designed to prompt thought in the reader or to be used in an open-ended class discussion. At the end of each chapter is an assignment for a guided discussion consisting of an outside reading and questions that could be individually answered and used to fuel a discussion in class.

This emphasis on process means that the book, especially the second section, contains less content than some other, less process-oriented texts. Thus, in comparison with other conservation biology texts, Van Dyke's is more focused on history, foundations, and problem solving. For example, *Conservation Biology in Theory and Practice* (Caughley & Gunn 1996) is much more targeted and applies science to a series of declining species examples, treating species declines more individually and with less focus on the background or direction of the field, though with a strong emphasis on the connection between legislation and economics and the success or failure of species protection plans. Meffe and Carroll's *Principles of Conservation Biology, Second Edition* (1997) is a thorough text used for upper-level undergraduate and graduate courses and likely to be used as

a comprehensive text and reference. Although it includes a chapter on the ethical basis of conservation biology, written by J. Baird Callicott, the foundations and interdisciplinary process learning are much less central to that text. Primack's *Essentials of Conservation Biology* (1993) and *A Primer of Conservation Biology* (1995) have more specific case studies of declining species and include some discussions on ethics and values, but much less history and fewer discussion questions than Van Dyke's book. In comparison with other texts, Van Dyke's book occupies a different niche than some of the other major conservation biology texts because of the process emphasis he has chosen.

A final feature of the text is its readability. It is very well written. The table of contents is complete and clear. I could see the logical framework of each chapter at a glance. The figures are primarily blue tones, with several pages of full-color figures. Most figures are uncluttered, and complex backgrounds on graphs are notably absent. References are found at the end of each chapter and include many primary sources and important texts in the formation of ecological thought. One exception to the clarity was in the workbook, where I wanted just a bit more detail in the preface about the use of the Web site, the approximate length of time each activity might require, and more specific suggestions for their use in the course. However, within each activity, the information was complete and clear.

By weaving the strands of past, present, and future, Van Dyke has presented a book that brings students into the discipline of conservation biology and shows them things that are working, things that are not, and ways that they can become a part of the solution. In

a world in which biodiversity loss is so significant as to warrant the life efforts of thousands of researchers, writers, and ordinary citizens, Van Dyke maintains a text that empowers students, giving them nuance, thought, skills, and direction that they can take as they join their older colleagues as conservation professionals.

The textbook and workbook could stand alone in a semester course in conservation biology or could be used to supplement another text in an ecology, a biology, or a related course. The critical thinking skills and practical advice for young scientists would make this a useful read for many undergraduates in science, regardless of their discipline. For a restoration ecologist, the book puts restoration in the context of conservation biology, explaining the value of restoring habitats and ecosystems because there is not enough preservable land to support the biodiversity we value. As Van Dyke put it, "Restoration rightly expands as well as dignifies, the human ecological role."

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## LITERATURE CITED

- Caughley, G., and A. Gunn. 1996. *Conservation biology in theory and practice*. Blackwell Science, Cambridge, Massachusetts.
- Meffe, G., and C. Carroll. 1997. *Principles of conservation biology*. 2nd edition. Sinauer, Sunderland, Massachusetts.
- Neisenbaum, R., and T. Lewis. 2003. Ghettoization in conservation biology: how interdisciplinary is our teaching? *Conservation Biology* 17:6–10.
- Primack, R. 1993. *Essentials of conservation biology*. Sinauer, Sunderland, Massachusetts.
- Primack, R. 1995. *A primer of conservation biology*. Sinauer, Sunderland, Massachusetts.
- Primack, R. 2003. Evaluating conservation biology textbooks. *Conservation Biology* 17: 1202–1204.