

Wetland Ecology Principles and Conservation.

Keddy, P. A. 2000. ISBN 0-521-78367-4 (paper US\$52.95) ISBN 0-521-78001-2 (hardback US\$140.00) 614 pp. Cambridge University Press, Cambridge, UK. - This text is the latest arrival in the excellent Cambridge Studies in Ecology series, and accordingly represents a critical review aimed at advanced undergraduates, graduate students and professional researchers. The author's expertise in wetland ecology is impressive and represents more than 25 years of research in this area, including innovative contributions to studies of competition, assembly rules and conservation. Thus, this book provides a comprehensive, thorough and up-to-date coverage of the current state of ecological knowledge for wetland systems. The book's readability is smooth with lucid presentations of all topics, avoidance of unnecessary jargon and the efficient use of uncomplicated figures and tables to emphasize major points. I found it enjoyable to read and easy to comprehend. The references have been carefully and appropriately selected. Most citations date from the 1980's and 1990's, but a few older works are cited as appropriate. Therefore, this review provides a perspective that emphasizes and summarizes relatively recent research.

The book is organized logically into three parts. Part one is an overview of the basic properties of wetlands where definitions, functions and wetland classification (chapter 1), zonation and succession (chapter 2) and diversity (chapter 3) are presented. Part two (chapters 4-9) treats the ecological factors controlling these wetland properties. This section is where crucial topics such as hydrology, disturbance and competition are discussed. The third part (chapters 10-12) provides a look into the future of wetlands with insightful discussions of wetland restoration and conservation.

The wetland overview is superb. First, a concise definition of wetlands is given that emphasizes both ecological and evolutionary aspects. This practical definition is then compared to various legal definitions in an interesting manner that discloses the author's distaste for unnecessary "word play". This short encounter clearly sets the mood for the rest of the book which presents all topics in a practical, non-sense manner. This common sense approach is soon again evident in the discussion of wetland classification which presents six "basic types" (swamp, marsh, bog, fen, wet meadow, shallow water) in preference over systems that emphasize locational rather than functional equivalency (e.g., the widely used Cowardin system), or the finely graded hierarchical European "-etum" systems that "...detracts from more important work, and at worst, simply creates confusion by distorting plant names and making work in wetlands obscure to all but a narrow group of experts." I've often felt the same way, but I'm glad that somebody else has come out and said it. I particularly liked the section on adaptations to flooding which is categorized as "the primary constraint". This is not just a token addition, but represents about 18 pages devoted to an excellent overview of the subject. The section on wetland functions is also effectively

summarized with good examples. Here you will discover many things about wetland functions including how much Potamogeton is found in turtle stomachs and the emission rate of methane from bogs. Part one concludes with a grim description of threats to the Pantanal, one of earth's largest wetlands. These two pages compel the reader to finish the book in order to learn what should and can be done to avert such dire environmental consequences through wise management strategies.

The first part concludes with a description of biotic and abiotic factors contributing to zonation and succession. Relevant models and theory are reviewed and the role of competition is emphasized using examples from quantitative empirical studies. Next follows a section on wetland biodiversity, the factors controlling it, biomass and conservation of diversity. Suffice to say that this section also presents a remarkably succinct yet insightful overview.

The second part of the book comprises essential ecological topics, i.e. those factors controlling wetland properties. This part begins with hydrology using examples ranging from rivers to potholes and peatlands. The importance of hydrology as the controlling force in wetland characteristics is emphasized by analogy to fire as a controlling agent for forest characteristics. Wetland fertility is then explored as a second key controlling factor. The disturbance chapter nicely weaves a transition between properties and examples of disturbance, seed bank regeneration and gap dynamics. The section on competition was surprisingly brief (only 35 pp.), but does successfully present a rather complete overview of how one tests for competition (said to be "a ubiquitous process in wetland plant communities") and how various constraints operate on competition.

The last quarter or so of the book is devoted to wetland restoration and conservation. Here, Keddy encourages the reader to proceed beyond simply realizing "how the patterns and species in wetlands are produced by multiple environmental factors acting simultaneously" and to learn how to effectively manage wetland systems using this knowledge. His emphasis is on the application of assembly rules where principles of evolutionary ecology are applied to determine how species with particular traits will pass through various environmental filters. Thus, there is a logical transition here from the filters (most notably hydrology, fertility, salinity and disturbance) which are discussed in the second part of the book, and the application of their understanding to wetland restoration. Keddy also recommends adoption of a functional approach to simplify the complex ecological interactions that occur in wetlands. His description of how this goal may be achieved points to much needed research in this area.

The book concludes with a chapter on wetland conservation and again conveys a surprising amount of insightful information in relatively few pages. The empha-

sis is on the formulation of priorities and the assessment of performance in meeting conservation goals. As already stated on the back cover of the book (“Advance praise for *Wetland Ecology*” by M. Bertness), this is “the best treatment yet available”. I agree.

After reading this book, you will feel as though you have been infused with information from several volumes rather than just one. I was impressed by the remarkable way that Keddy conveyed essential information without a lot of unnecessary detail or superfluity. As a result, most people with an appropriate background should be able to gain an outstanding grasp of modern wetland ecology, within just a few short days of easy reading. Certainly, this aspect will make Wetland Ecology an outstanding textbook, and it certainly should be considered by everyone who teaches a course in this area. - Donald H. Les, Department of Ecology & Evolutionary Biology, University of Connecticut, Storrs, CT 06269-3043.