

J. Wu, R.J. Hobbs (eds.): Key topics in landscape ecology

Cambridge University Press, Cambridge, UK, 2007, 297 pp, illus., Tables, Paper, US\$65.00, ISBN-13 978-0-521-61644-7

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Published online: 7 January 2009
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One sure sign that a scientific discipline has matured is the appearance of volumes summarizing “principles,” “perspectives,” “issues,” or “central concepts.” Several such books have considered landscape ecology in the last few years, providing a sense of what landscape ecologists think is important, what the glaring gaps are, and where the discipline is heading. This volume, derived from symposia held at the 2001 meeting of US-IALE and at the 2003 IALE World Congress, is the latest (but surely not the last) collection aimed at summarizing the state of landscape ecology and defining its future directions.

The 15 chapters have been contributed by 30 authors, most of them from North America (12) or Australia (10). There are no contributions from Asia, Africa, or Central or South America. This is not so much an omission as it is a reflection of the nascent status of landscape ecology in these regions at the beginning of this century. Programs in landscape ecology are rapidly developing in these parts of the world, however, and volumes such as this can help to guide this development. Because the issues confronting landscape ecologists may be different in these regions from those in North America, Australia, and Europe, future collections of this sort would benefit from an expanded, global, authorship.

Collectively, the contributions cover most of the current themes of landscape ecology: pattern, process, scale, modeling, applications, integration (“transdisciplinarity”), and the like. Interestingly, the book begins not with a review of principles, theories, or concepts, as one might expect, but with Louis Iverson’s assessment of the importance of high-quality data to landscape ecology. There follow several chapters that progress from landscape pattern analysis to establishing the linkages between patterns and ecological processes such as metapopulation dynamics, the spread of exotic species, or ecosystem functions. Two of these chapters delve into the value and use of simulation and spatial optimization models to increase our understanding of pattern-process linkages and provide guidance for landscape management. There is a refreshing (to me) emphasis on the roles of natural history and monitoring—aspects that are often overlooked or downplayed—in placing landscape metrics and models in a real-world context. As Hof and Flather observe, a “failure to devote more effort toward monitoring will perpetuate our current reliance on untested concepts and will heighten the contention and uncertainty that surrounds the use of planning models to derive spatially explicit habitat prescriptions.”

Not surprisingly, scale also receives considerable attention, both in a separate chapter by Wu and sprinkled liberally through many other contributions (although a few develop their points as if scale were unimportant). The recurrent theme, which is rapidly

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becoming a principle of sorts, is that we will not properly understand (or manage) landscapes or the elements they contain if we ignore scaling mismatches in space or time. The scale(s) of observation, analysis, and management must be commensurate with the characteristic scale(s) of the phenomena being observed or managed. This said (and it is said repeatedly), the contributions provide little additional guidance as to how one might go about ensuring an appropriate matching of scales, particularly when dealing with systems that contain multiple elements operating at different scales.

This illustrates what some might regard as a weakness or failing of the collection. Many of the chapters provide reviews of a topic and lists of things that are needed. These are indeed useful, and most are thoughtful and well done. But lists are not syntheses, and one is often left wondering what lies beyond the lists. What aside from a bullet point in a list can one carry away to help one figure out how to address the issues or needs? The chapter by Mackey and a host of colleagues about applying landscape ecology principles to regional conservation in Australia is perhaps an example. The chapter deals mostly with a particular approach to “rewilding” through creating a regional network of collected core reserves. The approach is interesting, but the linkage to landscape ecology, except for the statement of some general “landscape principles” (e.g., the importance of core areas, connectivity, and management of the matrix), is not fully developed.

As the editors note in their preface, “most, if not all, of the pressing ecological and environmental problems that humanity is faced with today are directly related to human alterations of landscapes.” They return to this theme in their concluding chapter, suggesting a hierarchical and integrated framework for landscape ecology that could facilitate the consideration of nature-society interactions in a landscape context—what they call “sustainability science.” This is an appropriate and laudable goal, and landscape ecology as a discipline is arguably better positioned to achieve it than any other scientific discipline. Yet the gap between “knowing” and “doing” remains, despite the valiant attempts of several contributors to this volume. This isn’t a criticism; rather, it simply indicates the enormity of the task of bridging the gap and the imperative to do so.

So who will benefit by reading this book? The jacket blurb proposes that the target audience includes “academic professionals and practitioners in ecology, environmental science, and landscape planning and design.” Probably true. But I would suggest that those who would most benefit are those setting out to become landscape ecologists, planners, or managers, particularly in regions of the world where issues about land use, resource management, environmental policy, and conservation are urgent and landscape ecology is just now taking root. There especially the “knowing-doing” gap must be closed, before it is too late for landscape ecology, with all its principles, concepts, theories, metrics, and models, to make a difference.