

Book Reviews

Restoring Natural Capital: Science, Business, and Practice

James Aronson, Suzanne J. Milton and James N. Blignaut, editors. 2007. Washington, DC: Island Press. Cloth, \$90.00. ISBN: 978-1-59726-076-3. Paper, \$45.00. ISBN: 978-1-59726-077-0. 384 pages.

This book is about the ways “natural capital” can be restored to degraded lands. The authors define the term natural capital as an economic metaphor for the stock of physical and biological natural resources available at a site. These might include renewable capital (such as species and ecosystems), nonrenewable capital (e.g., subsoils), replenishable natural capital (e.g., potable water or fertile soils) and cultivated natural capital (e.g., crops or forest plantations). The authors’ concerns are that, hitherto, economic systems have not appropriately valued natural capital (apart from cultivated natural capital). This has contributed to the degradation in many places of water, soil, ecosystems, and other forms of natural capital such that human well-being is at risk. Most vulnerable, the book’s authors argue, are some of the world’s poorest people.

The central question the authors pose, however, is not just how to restore degraded landscapes. Rather it is how we might do these things as a means of rebuilding the stocks of natural capital in order to increase the *value* of any restoration and thereby enhance the well-being of people. This effort relies on ecological knowledge, but also requires the insights and tools of economists. This is all to the good, since ecologists and economists should be natural allies. Both deal with systems that are subject to uncertainty and change and both usually operate without complete information about the systems they must deal with or about the outcomes of their decisions.

This book is based on two workshops on restoring natural capital, one held in Prince Albert, South Africa (2004), and the other in St. Louis, Missouri, USA (2005). The editors have done a superb job in gathering together an interesting and diverse group of ecologists, economists, and managers. They include those with practical field experience with the difficulties of carrying out restoration, as well as those with a more theoretical bent. In all, 71 writers have collectively contributed to 35 chapters. This could have led to a disjointed and unwieldy volume but there is a strong internal logic that envelops the various contributions and makes for a satisfactory whole. A useful inclusion at the end of each chapter is a section referred to as “Contribution.” Rather than a simple conclusion, this is more a device to help readers focus on how each chapter relates to the overall theme.

The book has four parts. The first of these is the “conceptual landscape” in which natural capital is described and some of the biological and economic dimensions of

the idea are explored in order to define common themes. Contributors discuss how valuation might be done using economic tools, but acknowledge that there is an ethical dimension as well. This section also highlights the significance of scale and points to some of the lessons learned from the Millennium Ecosystem Assessment program.

The book’s second part contains case studies from different places in the world where people are working to create natural capital. In most situations full ecological restoration is not possible. This may be caused by ecological or financial constraints or by differing agendas and aspirations of stakeholders. The 19 case studies review how targets have been set in various circumstances and the approaches that were then used to reach these targets. The studies are set in rich and poor countries, tropical and temperate regions, and humid and dry landscapes. The case studies reveal the complex and messy interface between ecological and socioeconomic systems, and how much more needs to be known about restoring natural capital.

Part Three addresses this problem by discussing tactics and strategies. These authors argue that proper methods of valuation for both the goods and also the ecological services provided by restored systems are key. Both monetary and nonmonetary values of natural capital are discussed. There are a variety of tools that might be used but not all are useful. The mere fact that, for example, benefits outweigh costs does not necessarily mean a project will be—or should be—adopted by all stakeholders. The old question of who gets the benefit and who pays the cost is often a serious problem, as is the issue of when and in what form the benefits might arrive. An intuitively appealing idea is that the best decisions are likely to be those that are regularly supported by a variety of different analytical tools and that are consistent with alternative sets of value systems. At the end of the day, the authors remind us, there will always be situations where special political, social, or cultural factors override or trump these tools. In such cases there will need to be plenty of discussion and trust-building with stakeholders if restoration is to proceed.

The fourth and concluding part of the book seeks to synthesize all that has gone before and suggest a way forward. The first chapter in this section is dedicated to the crucial question of scaling up in order to restore natural capital to degraded lands on a large scale. The authors suggest that the best way of doing this is to “mainstream” restoration and make it an intimate part of a much wider variety of economic policies and planning models. This chapter discusses the stimuli needed to achieve this and some of the mechanisms that might be used. The three authors look forward in the final chapter. They review the main themes emerging from the book (valuation, targets, priority setting) and conclude by suggesting that restoration should be an easy concept to market, since it is basically a positive and optimistic message. The need for the restoration of natural capital has never been greater, they argue.

The book should be of interest to all those who are concerned with not merely understanding the intellectual challenges of ecological restoration, but also with how to implement it in the field. Ecologists sensing they might need a new set of perspectives and tools to do this will find this an instructive and useful book.

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Habitat Fragmentation and Landscape Change: An Ecological and Conservation Synthesis

David B. Lindenmayer and Joern Fischer. 2006. Washington, DC: Island Press. Cloth \$80.00, ISBN: 1-59726-020-7. Paper, \$39.95. ISBN: 1-59726-021-5. 352 pages.

In a scene from the 1984 mockumentary film *This Is Spinal Tap*, guitarist Nigel Tufnel views a totally black album cover recently put out by his heavy metal band and wonders aloud, "How much more black could it be?" He concludes, referring to cover and content: "None more black."

While it is certainly hyperbole to suggest that our understanding of landscape fragmentation is similar to Tufnel's album and its cover art, there is a lot of "noise" in the current paradigm. The case can be made that the noisy results often obtained by fragmentation studies may be based on the misguided assumption that our theoretical and conceptual frameworks are realistic, adequate, and up to the task (Bissonette and Storch 2002). Debinski and Holt's (2000) review of habitat fragmentation experiments, McGarigal and Cushman's (2002) comparative evaluation of fragmentation experiments, and Haila's (2002) argument that the fragmentation concept is used as if it is a unitary phenomenon (with the result that empirical studies often show widely varying results with significantly different interpretations) clearly make Villard's (2002) point that "translating fragmentation effects into terms that can be understood and used in management has been most difficult." It is in light of challenges like these that advance praise for *Habitat Fragmentation and Landscape Change* is most unusual. On the book jacket, reviewer Mac Hunter describes the book as "an extremely useful and cogent synthesis"; Jrjö Haila states, "a book we have been waiting for"; and Jerry Franklin comments, "we finally have an up-to-date overview of the complex topic of habitat fragmentation." These statements, however, are not hyperbole.

Certainly we have recognized for some time that the effects of landscape composition and arrangement needed to be distinguished. Fahrig (2003) gave us a way to think

about habitat loss and fragmentation per se, that is, the breaking apart of habitat after controlling for loss. This new book by Lindenmayer and Fischer provides a holistic clarity that is sorely needed and is a must-read for conservation biologists, landscape ecologists, and other serious students interested in what happens to (mostly wildlife) species in the face of landscape change.

I must admit that I was predisposed to like this book even before reading it. I have been following the very good thinking coming out of Australia and New Zealand over the past decade and a half. Lord and Norton (1990) asked us to think about fragmentation as a disruption of continuity, expanding the concept from strictly spatial to both temporal and functional (process) domains. A 1991 paper by Saunders, Hobbs, and Margules recognized that the landscape matrix influenced fluxes of radiation, wind, water, and nutrients, thus impacting remnant patches of vegetation. In 1992, McIntyre and Barrett suggested habitat variegation as an alternative to the Fragmentation Model (Island Model and the Patch-Matrix-Corridor Model). Their clear implication was that the modified matrix was important as habitat for species. McIntyre et al. (1996) and then McIntyre and Hobbs (1999) focused on the habitat vs. non-habitat question by proposing a continuum of habitat modification that ranged from intact, variegated, and fragmented to relictual landscape states. McIntyre and Hobbs further refined modification effects that might be associated with the different levels of landscape destruction and pointed out that an organism's view of the landscape pattern was scaled. These ideas, coupled with the Manning et al. (2004) paper that connected the concepts of continua in nature and individual species perception and response and the Fischer and Lindenmayer (2006) paper that outlined a conceptual model linking pattern and process, provide some of the historical and current literature upon which this book is based.

The effects of fragmentation have not been tractable to easy solutions. Bunnell's (1999) insight, that habitat fragmentation has been treated as a panchreston (that is, an overly simplified definition to explain what is much more complex), is, as the authors explain, the defining argument for this volume (Lindenmayer and Fischer 2007). The book's first chapter begins by providing intelligent and effective distinctions between important terms that reflect its organization. For example, distinguishing between species and human perspectives of the modified landscape allows a finer parsing of the different effects of fragmentation. When the authors refer to habitat, they mean a species perception. Conversely, they link the terms vegetation cover, loss, and deterioration strictly to a human viewpoint. This distinction is the beginning of the value-added clarity, but it does not end there. Chapter 3 distinguishes landscape processes that influence single species, on the one hand, and landscape patterns that are related to species assemblages, on the other. Processes related to