

Re-Visioning Conservation

Rewilding North America. A Vision for Conservation in the 21st Century. Foreman, D. 2004. Island Press, Washington, D.C. 295 pp. \$50.00 (hardcover). ISBN 1-55963-060-4. \$25.00 (paperback). ISBN 1-55963-061-2.

The biggest challenge conservation biologists face is persuading others how important conservation is. We must first convince them that our current extinction crisis is the most important scientific discovery of the twentieth century. We must next convince them that our science gives us the knowledge to halt the mass extinction via selecting, designing, and establishing new protected areas and active restoration. Finally, we must present a clear vision and agenda for twenty-first-century conservation that can stir citizens to vigorously support conservation. In *Rewilding* Dave Foreman plainly lays out these points (pp. 11, 110, and 177) as the organization for this book. The grizzly bear tracks on its cover invite closer examination and serve as a synecdoche for its contents.

Foreman first relates the “Bad News,” exploring the full depth, nature, and implications of our current extinction crisis. This sober, clear-eyed analysis of our current predicament distinguishes three waves of extinction with distinct dynamics. We first step back into the Pleistocene to explore just how and when human expansion out of Africa doomed large animals almost everywhere else. Disease and climate may have played supporting roles, but the evidence overwhelmingly supports Paul Martin’s overkill hypothesis. Foreman sees the spread of Europeans along

with their agriculture, silviculture, and fishing as the second wave and globalization and soaring human populations that have accelerated extinctions since 1970 as the third wave. The particular causes of extinction (“wounds”) are then explored in convincing detail. The points are clear: extinction is not a recent problem, and we cannot address the complex causes of today’s extinctions with simple remedies. *Rewilding* treats these topics in depth.

The second part of *Rewilding* is devoted to conservation biology—how the field developed and how it informs current efforts to conserve. Readers learn of extinction dynamics, metapopulation theory, shifting disturbance regimes, and the relevance of island biogeography. Historical approaches for selecting and designing protected areas are reviewed as a prelude for considering how these can be updated to address contemporary concerns for maintaining biodiversity. Foreman has done his homework here. We learn of prescient efforts by Victor Shelford and the Ecological Society of America in the 1920s and 1930s to establish a functional network of preserves. Foreman also emphasizes that John Muir, Aldo Leopold, Olaus Murie, and Bob Marshall all had training as scientists. Ecological concerns therefore have long been a basis for protecting wilderness (in contrast to some revisionist history). Foreman relates this history both for its own sake and to introduce the Wildlands Project, with its emphasis on protecting large connected areas with intact populations of carnivores and ecological processes.

These discussions lead to a fundamental point that distinguishes the vi-

sion related in *Rewilding* from much other recent work in conservation biology. Whereas others have effectively championed the importance of large areas and corridors, Foreman strongly emphasizes the importance of large carnivores for sustaining functional, diverse ecosystems. Here, he draws on the recent work of John Terborgh, Brian Miller, Jim Estes, William Ripple, and others to argue that top-down trophic cascades are not merely an ecological curiosity but fundamental for sustaining ecological integrity. By controlling the abundance of mesopredators and ungulates, which are prone to irrupt in abundance, predators play keystone roles in many ecosystems. As Ripple and Beschta (2004) point out, these studies support Leopold’s classic arguments on the ecological importance of predators. The obvious implication here is that restoring only token populations of predators in a few areas will not suffice to serve broad conservation goals. Predators also gain strategic importance. Instead of serving just as charismatic umbrella species (or colorful ornaments to adorn the logos of conservation organizations), predators become crucial components for maintaining ecosystem integrity.

The concluding section (“Taking Action”) focuses on solutions. Just how might we design a wilderness network that could truly function to sustain plant and animal diversity indefinitely? Drawing on ideas from Reed Noss, Michael Soulé, and others, *Rewilding* emphasizes the three Cs: cores, connectivity, and carnivores. This discussion is mostly conceptual but is grounded in enough specific examples to put empirical

flesh on the theoretical bones. Foreman does not hesitate to list criteria or prescribe specific actions designed to make sure these networks serve biotic goals. His considerable experience in practical conservation grounds and informs this discussion. Concrete examples (such as the sky islands of the southwestern borderlands of the United States) prevent this section from being too abstract or preachy.

Other books have tackled these goals with a similarly broad vision and depth of scientific understanding (e.g., Wilson 1994). However, no recent book I have read has laid out the bad news with such compelling force and detail or presented such informed and passionate arguments for thinking big as we seek to conserve nature through the current bottleneck. I have not encountered any more convincing summary of our current predicament and the key roles conservation biology should play in addressing these issues. Nor has any other book taught these lessons in such compelling and engaging terms. I was reminded of another voice from the Southwest. Like Aldo Leopold, Foreman urges us to construct our conservation efforts on a solid scaffold of science. Like Leopold, Foreman teaches us to appreciate natural and human history and the unique importance of large wilderness areas. Like Leopold, Foreman wants us to base our conservation on sound ethics and wise policies.

Is *Rewilding* a popular book aimed at a broad audience or a book for scientists and conservation professionals? General readers interested in learning more about our current extinction crisis and its causes are well served. Overhunting, habitat loss and fragmentation, modifications of historical disturbance regimes, exotic species, loss of predators, and climate change are all covered with skill. In fact, I have seen no clearer discussions of these "ecological wounds." Foreman somehow manages to be comprehensive, historically informed, accurate, and succinct. This

makes the book surprisingly well suited to serve as a text for introductory courses in ecology or conservation biology. Students will particularly appreciate the compelling nature of these stories and Foreman's ability to connect the dots among conservation science, tactical conservation issues, and strategic ideas for conserving the biota of North America. The book's provocative vision will certainly spark interest and lively discussion.

Scientists and professionals will appreciate Foreman's ability to place their work in geological, historical, and geographic perspective. Despite a lack of traditional academic credentials, he is a nuanced scholar with a commanding knowledge of our history and science (as evidenced by 47 pages of notes). Moreover, he is a great storyteller. Some might be tempted to ignore the book for having ideas about conservation that are so ambitious as to appear patently impractical. That would be a mistake. Even those who do not fully accept its sweeping vision for rewilding should read this book to follow the logic of its arguments, learn more of our history, and glean arguments for their own work. They might also consult the associated Web site (<http://TheReWildingInstitute.org>).

Who is our guide here? Ironically, this champion and scholar of conservation biology began his career as a citizen activist. In the introduction, Foreman relates watching "the high desert between Albuquerque and the Sandias gradually disappear under a carpet of asphalt and buildings . . . roads ripped into the wilderness, forests buzz-cut, rivers dammed, coal torn from the badlands" (p. 1). As related in *Confessions of an Eco-warrior*, Foreman (1991) entered the fray as a foot soldier working the trenches of Washington during pitched battles over wilderness in the 1970s. When this grew more frustrating than rewarding, he morphed into a subcommandante for the citizen activists of Earth First! The limitations of direct action

soon became apparent, leading him to step back from the fray to ponder how ethics and conservation biology might provide a more secure platform for pursuing conservation. *Rewilding* reflects the maturity Foreman has won from these experiences and a conscience born of his unique odyssey.

Here is a valuable and multifaceted book from a multifaceted author. It is simultaneously a work of history, science, and policy that will appeal to several different audiences. Its chief value for conservation biologists may lie in the overviews it provides and the provocative vision it presents. The book forces us to take a step back and reconsider what we have accomplished and where our efforts still fall short. At a time when so many conservation efforts seem small or foundering, we have particular need for such a positive and ambitious vision.

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Oregon's Big Outside

Oregon Wild: Endangered Forest Wilderness. Kerr, A. 2005. Oregon Natural Resources Council, Portland, OR. 255 pp. (xvii + 238). \$29.95 (paperback). ISBN 0-9624877-8-3.

The Wilderness Act of 1964 established a procedure for the U.S. Congress to permanently protect roadless areas, and it founded the National Wilderness Preservation System, with 54 designated wilderness areas totaling 3.68 million ha in 13

states. Today there are over 42.9 million ha of designated wilderness in 678 areas located in every state except Connecticut, Delaware, Iowa, Kansas, Maryland, and Rhode Island.

In 1989, 25 years after passage of the Wilderness Act, Foreman and Wolke's (1989) book *The Big Outside* described, and advocated protection of, every roadless area larger than 40,468 ha (100,000 acres) in the western contiguous United States and 20,234 ha (50,000 acres) in the east. They described 18 such areas in Oregon, including several in the high desert of southeastern Oregon. Andy Kerr's *Oregon Wild: Endangered Forest Wilderness* takes *The Big Outside* a step further by describing and mapping roadless forest areas larger than 404 ha (1000 acres) in Oregon. According to Kerr, over 930,000 ha have been designated as Wilderness in Oregon, but another 2 million hectares of unprotected publicly owned roadless forest remain. *Oregon Wild* presents wilderness proposals for most of those forests.

The introduction by Kathleen Dean Moore, Professor of Philosophy at Oregon State University, explores the value of wilderness in the modern world. Kerr's first chapter describes the forested regions of the state and the animals and plants that live in them, including four medium-sized carnivores that are in decline in Oregon (lynx [*Lynx canadensis*], marten [*Martes americana*], fisher [*Martes pennanti*], and wolverine [*Gulo gulo*]); two large carnivores extirpated from the state (wolf [*Canis lupus*] in 1946 and grizzly bear [*Ursus arctos*] in 1931) that might be reintroduced; the six anadromous salmon and trout species that spawn in Oregon waters; "featured species" whitebark pine (*Pinus albicaulis*), quaking aspen (*Populus tremuloides*), and western larch (*Larix occidentalis*) (one page for each); and even a "a maybe mammal," Bigfoot (also called Sasquatch [*Gigantopithecus canadensis*]) (a

couple of paragraphs). Kerr has not let the urgency of his subject prevent him from sprinkling humor through his book.

Chapter 2 is an "unnatural history" of Oregon forest destruction by logging (the first sawmill in Oregon was built in 1843), road building, grazing, fire suppression, and other human disturbances. These five threats are among his "top dozen threats to Oregon's forest wilderness." Chapter 3 is a political history of the battles for Oregon Wilderness protection, which at 3.6% of the state is a smaller proportion than in the neighboring states of California (13%), Washington (10%), or Idaho (8%). Chapter 4 articulates a dozen arguments for protecting more forest wilderness in Oregon, even areas as small as 404 ha, including biodiversity conservation, recreational opportunities, the value of ecosystem goods and services such as clean water, and leaving a legacy for future generations. Kerr also offers refutations of several arguments (primarily economic) against wilderness protection.

The heart of *Oregon Wild* are chapters describing 32 new wilderness areas proposed by the Oregon Wild Forest Coalition to add to the current 37 designated wilderness areas in the state's five forested level III ecoregions: the Coast Range ("Home to Oregon's Rainforests"), Klamath Mountains ("World-Class Biodiversity"), Cascades ("Young Volcanoes and Old Forests"), East Cascades ("Dry Open Forests"), and Blue Mountains ("Neither Cascades nor Rockies but with Attributes of Both"). Natural history information, photos, maps, and detailed descriptions of selected units within each proposed new Wilderness area are included. This section of the book could serve as a guide to wilderness lovers wishing to visit unprotected wild forests in the state, perhaps before it is too late; Kerr directs us to hiking trail information for each area.

Although the wildlands along the Cascade crest, a mix of designated

and proposed wilderness, form a nearly continuous tract from the Columbia Gorge to the southern Cascades, much of the other proposed wilderness constitutes an "archipelago" of smaller patches that are certainly important but may be too small to maintain their old forest communities in the face of natural disturbance or to sustain viable populations of area-dependent species such as carnivores. Kerr emphasizes that the goal of the Oregon Wild Forest Coalition is to protect forest wilderness "not in isolation, but as part of a conservation and restoration framework that extends throughout the state beyond the borders of the individual Wilderness areas," a framework designed according to the "cores, corridors, and carnivores" model. If wolverines and other meso-carnivores are to survive in Oregon, and wolves and grizzly bears are to be reintroduced here, a network is more likely to foster their survival than an archipelago. An important next step for the coalition would be to identify areas suitable for connecting these isolated patches of old forest.

Oregon Wild is well illustrated with 168 beautiful photographs by several accomplished photographers and 40 maps produced by Erik Fernandez of Oregon Natural Resources Council. However, the book was admittedly written for a lay audience, and literature citations are rather sparse. The many useful appendices cover current wilderness and other protected areas in Oregon; what to do to help protect wild forests; enjoying Oregon's unprotected forest wilderness; selected Web sites; and, recommended readings in ecology, conservation biology, natural history, political and social history, wilderness, and wilderness activism.

If you prefer apolitical natural history books, *Oregon Wild* may not be a good choice for you. Beautiful and informative, it is also a "campaign book" for wilderness protection in Oregon. Like Foreman and Wolke, Kerr does not mince words

about the need to counter the efforts to degrade wild forests made by “timber beasts, cattle barons, mining conglomerates, land developers, unenlightened (and sometimes venal) bureaucrats and motorheads who have forgotten how to walk.” He urges his readers to do something to protect Oregon’s threatened wilderness, including contacting elected officials, donating time and money to wilderness conservation organizations, and encouraging friends and family to do the same. Much of the work to establish designated Wilderness happens at the state level, and a book like *Oregon Wild* would be a useful organizing tool for wilderness advocates in any state, and perhaps elsewhere in the world.

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Herping in La Selva Just Got Easier

Amphibians and Reptiles of La Selva, Costa Rica, and the Caribbean Slope: a Comprehensive Guide. Guyer, C., and M. A. Donnelly. 2004. The University of California Press, Berkeley, CA. 307 pp. (299 +viii). \$24.95 (paperback). ISBN 0-520-23759-5.

La Selva is a private reserve located in the lowland tropical wet forests of northern Costa Rica. The region is home to a thriving research station and is one of the most intensively studied areas in Central America. As such, researchers, students, and the interested tourist will welcome the addition of a comprehensive herpetological field guide to their library. In areas with such great biodiver-

sity, a guide that limits the species by range can be helpful—especially if one is not adept at making one’s way through the hundreds of gloriously thorough, but heavy, pages of Jay Savage’s (2002) tome.

Amphibians and Reptiles of La Selva is a well-written, easily navigable guide summarizing the authors’ combined 40 years of research. The book is divided into a concise introduction covering the habitat, history, and conservation efforts of La Selva followed by one section on amphibians and one on reptiles. In the latter two sections, the class descriptions and characteristics common to that group are summarized, concluding with a dichotomous key to the orders of the appropriate class. Subsequent taxonomic groups are similarly treated, with keys down to species level. The keys are clarified, when appropriate, with line drawings.

The keys are fairly easy to use, and when possible, are based on easily observed characteristics. A sample data sheet toward the end of the guide ensures that the user notes the necessary physical features. For those less familiar with morphological jargon the glossary is indispensable. The well-made keys are undoubtedly the best way to identify species, but they are of limited use without the specimen in hand, as is often the case with venomous snakes. The authors concede, when describing the features common to the Viperidae (pit vipers and true vipers), “if you are close enough to the animal to use these characteristics for identification purposes, you are probably too close.” Fortunately, the two poisonous families are represented by only a half dozen or so species, although caution should also be used with all unfamiliar species because even some colubrids are fairly venomous.

Many users will at some point resort to flipping through the photographs that vary greatly in quality. Some are gorgeous, with rich color, good composition, and perfect exposure. Other photographs feature distracting backgrounds that include

the unfortunately placed flip-flop or bandaged knee; have lizards in compromising positions; or are simply overexposed. Common names are provided for photo identification, whereas scientific names might have been useful, especially when many species are referred to in English and Spanish.

I have always preferred paintings to photographs in field guides. Knowledgeable illustrators can average their experience of the idiosyncrasies of each species. They can also control for light, position, and even exaggerate key characteristics. However, illustrating hundreds of species for a field guide is not always feasible, and for this one, users will have to be content with the keys and extensive and engaging written descriptions. Arguably, the information provided in the guide should more than make up for what is lacking in some of the photographs.

Ultimately, *Amphibians and Reptiles of La Selva* is a useful, practical guide and a good read. It is definitely destined for the kind of abuse all great field guides face. Numerous copies of the guide will be dropped in the mud, dog-eared, annotated ruthlessly, and smeared with the forgotten banana in the field pack until almost unreadable, at which point we will be eagerly awaiting the next edition.

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Ecological Consequences of Habitat Loss from a Population and Landscape Perspective

The Shrinking World: Ecological Consequences of Habitat Loss.

Hanski, I. 2005. In O. Kinne, editor. *Excellence in Ecology*, Book 14. International Ecology, Institute, Oldendorf/Luhe, Germany. 334 pp. (xxvii + 307). 47. ISSN 0932-2205.

Yes, this is another book on habitat loss and the threat it poses to biodiversity, but this book is different. Ilkka Hanski has orchestrated a thorough scientific tour of habitat, habitat loss, responses to habitat loss, and habitat loss and extinction to provide an understanding of the ecological consequences of a shrinking world. To write his score, he adapted largely the perspective of populations and metapopulations and enriched the book with examples gathered mostly from Finland, his home country. Hanski focuses on populations and metapopulations that still occur in vast number on the planet rather than inventorying current and predicted habitat and species loss. He argues that a proper understanding of the ecological consequences of a shrinking world can only be based on the understanding of the dynamics of populations at the landscape level. As a consequence, the book is a solid scientific summary of decades of research on habitat, populations, and metapopulations. He also managed to focus contemporary debates between landscape ecologists and metapopulation biologists.

In a review on an earlier book of the *Excellence in Ecology* book series (Lawton 2000), Hanski wrote: "I have to confess that I am attracted to books combining science that is familiar to me with an autobiographical account of the author's work . . . it just is so interesting and enlightening to read a personal narrative of how a scientist who has made important contributions came to study what he or she did, and to have a glimpse at the broader context of the research, hardly ever presented in journal articles" (Hanski 2000). I have to confess that I could not find better words to characterize what makes Hanski's new book so special.

Rarely do written scientific accounts of current challenges and big questions in ecology display a combination of fine literary style, anecdotes, thoughtful research, and provocative and compelling analysis. Hanski has managed to skillfully weave all these elements into his book. A key element of this is that each chapter of the book begins with a narration that delineates in a personal and informal manner the chapter's content. Other parts of the book maintain this fresh and lively style, for example when Hanski, who is known largely for his work on metapopulations, confesses his long-lasting affection for beetles living in cow pats (p. 11). This makes the book different and a real delight to read. This style is well in the spirit of the *Excellence in Ecology* series, whose editor has encouraged the authors to present their personal experience, insights, and visions on the state of the art in their field of expertise.

The book consists of five chapters. Before talking about habitat loss and its ecological consequences, chapter 1 closely delineates the subject—habitat—from multiple perspectives. It recalls the different definitions of habitat and summarizes the development of ideas around habitat and niches and how research interests shifted more recently toward spatial structures in populations and habitat loss. The subchapter "Habitat Classifications" provides the solid foundation for the following chapters and leads naturally to fragmented landscapes, connectivity, and the basic concepts of metapopulations. Chapter 1 closes with a description of several important microhabitats such as dung and carrion, fungal fruiting bodies, and decaying wood, which contain much of global biodiversity, and a fascinating tour through the major habitats of the Earth at prehistoric times and at present.

Chapter 2 is dedicated to habitat loss. Here Hanski acknowledges the multiscale character of habitat loss and justifies the selection of the pop-

ulation level at which he analyzes its ecological consequences. Interestingly, one of his four main arguments for the selection of the population scale is not an ecological one but that a dense network of local populations should be conserved so that people have the opportunity to enjoy natural habitats and its inhabitants in their proximity (p. 72). This already anticipates an important theme of the fifth chapter in which Hanski leaves the immediate domain of natural science and turns to questions such as "habitat loss in our minds" and "importance of taking children to nature." However, before the book is ready to embark into these questions, more hard science awaits the reader. The chapter moves to discussing, as overture to chapters 3 and 4, the consequences of different kinds of habitat loss and dynamic landscapes. Chapter 2 closes with a picture of global habitat loss for important habitat types such as forests, wetlands, and various microhabitats.

Chapter 3 discusses "individual, population, and species responses to habitat loss." In a prelude Hanski remembers the beginning of the Glanville fritillary project in the early nineties that has since occupied a large part of his scientific activity. The chapter moves on, reviewing habitat selection, source-sink, ecological traps, SLOSS, habitat selection algorithms, and the question about the relative effects of habitat loss and fragmentation on the long-term persistence of populations. Hanski also does not shrink from making provocative but compelling arguments when dismantling the work of others (e.g., the argument of Leonore Fahrig and colleagues that only the amount of suitable habitat counts and that the spatial configuration makes little or no difference [p. 131–132]). This chapter closes with genetic and evolutionary consequences of habitat loss.

Chapter 4 on "habitat loss and extinction" is the scientific heart of the book in which Hanski summarizes

all the previously provided material to discuss the ecological knowledge that may allow us to examine the “health of biodiversity in the shrinking world.” To discuss extinction, he starts with single populations, expands to the discussion to spatial scales, then expands to metapopulations, large-scale species–area relationships, and global rate of species extinction. In the following section on extinction thresholds, Hanski asks how much habitat can be lost, and how fragmented the remaining habitat can be, without certain species becoming extinct. Clearly, this is the fundamentally important question about the shrinking world. Here Hanski’s sharp arguments demolish another common belief, the 20% rule of thumb for the extinction threshold (p. 171–174). He quickly takes this argument further into a deeper treatment of metapopulation theory and revitalizes the formal structure of the classical Levin’s model with a “spatially realistic metapopulation theory.” The reinterpretation of the classical equation, obtained by means of somewhat heavy mathematics and clever approximations, now contains a metapopulation capacity λ_M instead of the fraction of suitable patches as the key element describing habitat loss. The metapopulation capacity summarizes both the spatial structure of the landscape and several species-specific properties; the resulting model can be used to assess the value of the extinction threshold. This new model constitutes a quantum leap in providing a real integration of landscape ecology and metapopulation modeling into a unified framework. Chapter 4 then moves on to exploring practical questions, including the relative importance of habitat quality, lost area, or fragmentation, which are discussed in full detail. The second part of this chapter shifts the focus toward larger scales and communities to discuss the relationship between species number and area and the global rate of species extinction.

In chapter 5, Hanski turns first to the conservation challenges in a shrinking world before leaving the immediate domain of natural science in discussing “ecology, conservation, and competing interests in society,” exemplified by forest biodiversity in Finland. Should ecologists just observe the adverse consequences of habitat loss or attempt to actively advise society about the broader implications of their research? Hanski identifies “habitat loss in our minds,” which occurs if habitats are rarely encountered by people because they mostly live in towns and cities with minimal contact with any kind of nature or because the habitats have become rare, as a fundamental problem in modern societies. This leads to a depreciation of the values of natural habitats simply because they are far away and seem unimportant. The chapter closes with hope for future generations by outlining the “importance of taking children to nature” and a final reminder to his ecologist colleagues to make sure that the best scientific knowledge is transferred in an unbiased manner to the political decision-making process.

The final epilogue presents, in the judgment of Otto Kinne, the editor of the *Excellence in Ecology* series, “a wealth of interesting and significant insights.” This book will make wonderful reading in a graduate seminar in providing excellent and abundant core material on the ecological consequences of habitat loss, and it should find a place on the shelves of many readers of this journal.

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Research Science Publisher and Ecology Institute, Oldendorf/Luhe, Germany. 227 pp.

Determining What’s Important about Landscapes

Issues and Perspectives in Landscape Ecology. Wiens, J., and M. Moss, editors. 2005. Cambridge University Press, Cambridge, United Kingdom. 406 pp. (xvi + 390). \$65.00 (paperback). ISBN 0-521-53754-1.

Landscape ecology as a discipline has been developing and maturing over the last 25 years. It emerged from the issues and challenges of spatial complexity, the increasing impacts from broad-scale environmental problems and management, and technological advances that allowed manipulation of increasingly available spatial data. Landscape ecology has promoted the integration of many perspectives, issues, and methodologies as a unique characteristic of the discipline. However, Wiens and Moss, along with many other authors in this book, assert that landscape ecology’s potential weakness may be the interdisciplinary approach touted as its strength, and that the discipline itself is at a “critical threshold” in its growth. As the field of landscape ecology has developed, a well-recognized division arose between the “geocological and bioecological solitudes” of landscape ecology. The fear is that unless these “two solitudes” are unified by a strong, unique set of core principles, the field of landscape ecology will become fragmented into subdisciplines.

The book does not state what the core principles should be, but through a collection of essays, presents the varied personal statements and perspectives of many landscape ecologists on issues within their expertise that they believe are important for the discipline to mature and become unified. Forty-one authors from 10

countries were asked to revise and update essays presented at the Fifth World Congress of the International Association for Landscape Ecology in 1999. The editors grouped the essays into seven broad parts; however, there is no overarching theme to the book, and each essay stands on its own.

The first part of the book begins with a well-written essay that reviews what landscape ecology is, what a landscape-scale study is, and when a landscape perspective is necessary. The second essay outlines geographical principles often forgotten in detailed analyses and landscape ecology texts, but should be considered for bringing about cohesiveness and synthesis among the disparate research approaches taken by landscape ecologists.

The second part examines theories, experiments, and models in landscape ecology, providing an excellent review and looking ahead to future challenges for understanding landscape dynamics. Specifically, the first several chapters explore and review the theories of hierarchy, percolation, spatial population dynamics, economic geography, and equilibrium/nonequilibrium landscapes, and the relationship between scales of disturbance and landscape extent. The importance of fine-scale patch structure to landscape functionality is used as an example of applying landscape ecology concepts to help restore systems (chapter 6). The problem of scale in studying species interactions and how to determine the scale at which organisms respond to variability is discussed (chapter 7). To help establish a theoretical basis for landscape ecology, the author of chapter 8 advocates conducting experiments at several spatial scales and levels of organization simultaneously to help find processes most likely to propagate through levels and scales in spatial mosaics. The last two chapters review methods of spatial modeling and discuss the problems that hinder progress in modeling.

In part three, "Landscape Pattern," the authors discuss how pattern anal-

ysis must develop more tools and methodologies to (1) detect patterns of gradients in a landscape to supplement the patch-mosaic paradigm, (2) begin classifying landscapes based on the dynamics of processes rather than structural elements, and (3) find ways to incorporate cultural patterns. Chapter 12 outlines surface metrology, fractal analysis, and spectral and wavelet analysis as promising techniques. Chapter 13 reviews the various land-cover databases available and explains their various limitations and problems to help users better understand and correctly apply these data sources.

The legacy of landscape history on present-day landscape patterns and the need for landscape ecology to consider longer time scales to understand long-term landscape processes, especially those associated with climate change, is the focus of part four, "Landscape Dynamics on Multiple Scales." To understand what causes landscape heterogeneity and change, the authors discuss the use of past episodic erosion and sedimentation events (chapter 14), based on "cultural soils," to get a profile of past human-related activities (chapter 15) and the use of paleoecological records to recognize long-term edaphic and climate changes (chapter 16). Linking landscape ecology issues with global change is necessary to build global-scale models whose domain extends beyond current climate and land-use conditions.

In part five, "Application of Landscape Ecology," the authors review the synergy that exists between landscape ecology and the fields of agriculture, forest management, wildlife management, restoration ecology, conservation planning, conservation biology, and riverine management. Landscape ecology can be the vehicle for integrating information between these sciences and spatial planning, policy, and management with the hopes of enhancing communication and collaborations among them.

Part six, "Cultural Perspectives and Landscape Planning," stresses that landscapes are both natural and cul-

tural, meaning valued by humans for uniqueness. Chapters in this part explore the conceptual divide on what "landscape" means to policy makers, local planners, conservationists, locals versus newcomers, theoretical and applied planners, economists, and landscape architects. The hope is that by recognizing these divisions, landscape ecologists can begin integrating approaches to better understand the many dimensions of functioning cultural landscapes. Finding out what motivates and drives people will help predict future land-use trends and help planners design new landscapes to accommodate increasing population expansion.

The book ends with a "Retrospect and Prospect" composed of four thought-provoking chapters. Zonneveld (chapter 32) uses the metaphor of Pandora's box to discuss the positive and potentially negative consequences of applying the "black box" approach to modeling the complexity of landscapes. Naveh (chapter 33) discusses ways landscape ecologists can make a shift from an integrated to a transdisciplinary approach that becomes more holistic, future oriented, and includes the human dimension to become a more influential science. Moss (chapter 34) contends that landscape ecology must begin to develop its own distinctive core and focus by examining problem-based issues about landscapes. Wiens (chapter 35) believes that "Determining what's important about landscapes, . . . binding the science and the action to a well-developed conceptual core, . . . and recognizing that culturally based approaches to landscape ecology lie at the center rather than the periphery of the discipline" are the themes that should be addressed, and that conservation may be the catalyst to unifying landscape ecology.

Even though the essays are diverse and there are no formal connections between them, I did not find it distracting or confusing. Each essay was relatively short and well written with the goals explicitly mentioned early. The authors do not go into great detail, but present the essence of

the concepts with many pertinent examples and current literature citations. Given the breadth of topics covered, beginning and seasoned landscape ecologists, researchers of other sciences, students, managers, land-use planners, and policy makers will find the book a useful reference for their own discipline, and it will certainly spur thoughts and new directions for their research and collaborations. Being trained from the "bioecological solitude" philosophy, I found the part on cultural landscapes to be especially informative. It has broadened my thinking into the human dimension of landscape change, which will undoubtedly influence my future work.

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Recently Received Books (October 2005—December 2005)

The Chimpanzees of the Budongo Forest. Ecology, Behaviour, and Conservation. Reynolds, V. 2005. Oxford University Press, Oxford, United Kingdom. 310 pp. (297 + xiii). \$59.50 (paperback). ISBN 0-19-851546-4.

Demons in Eden. The Paradox of Plant Diversity. Silvertown, J. 2005. The University of Chicago Press, Chicago, IL. 179 pp. (x + 169). \$25.00 (hardcover). ISBN 0-226-75771-4.

Ever Blooming: the Art of Bonnie Hall. Hall, B. 2005. Oregon State University Press, Corvallis, OR. 104 pp. \$25.00 (hardcover). ISBN 0-87071-116-4.

The Future of the Wild. Radical Conservation for a Crowded World. Adams, J. S. 2006. Beacon Press, Boston, MA. 290 pp. (xxiii + 267). \$27.95 (hardcover). ISBN 0-8070-8510-3.

Biodiversity and Soils

Sustaining Biodiversity and Ecosystem Services in Soils and Sediments. SCOPE Series, Volume 64. D. H. Wall, editor. Island Press, Washington, D.C. 2004. 320 pp. \$60.00 (hardcover). ISBN 1-55963-759-5.

Sustaining Biodiversity and Ecosystem Services in Soils and Sediments is an important work that brings attention to those surface and subsurface environments that provide a remarkable array of biogeochemical interactions. This book illustrates well the interdependence and relationships between important ecosystem "services" for humans and the complex and intricate biodiversity that exists within soils and sediments that plays a fundamental role in critical ecosystem functions.

A large volume of scientific information was used to synthesize the understanding and interrelationship of

Headless Males Make Great Lovers & Other Unusual Natural Histories. Crump, M. 2005. The University of Chicago Press, Chicago, IL. 207 pp. \$25.00 (hardcover). ISBN 0-226-12199-2.

Island. Fact and Theory in Nature. Lazell, J. 2005. The University of California Press, Berkeley, CA. 402 pp. (xx + 382). \$49.95 (hardcover). ISBN 0-520-24352-8.

Metacommunities. Spatial Dynamics and Ecological Communities. Holyoak, M. M., A. Leibold, and R. D. Holt. 2005. University of Chicago Press, Chicago. 524 pp. (xi + 513). \$38.00 (paperback). ISBN 0-226-35064-9.

The New Atlas of Planet Management. Revised edition. Myers, N., and J. Kent, editors. 2005. The University of California Press, Berkeley. 304 pp., 288 color illustrations, 29 color photographs. \$39.95 (paperback). ISBN 0-520-23879-6.

Place Matters. Geospatial Tools for Marine Science, Conservation, and Manage-

biodiversity and ecosystem functioning presented within this work.

The arguments and themes within it are well supported with robust literature-cited sections. The information assembled and used for this volume is diverse, interdisciplinary, well integrated, and well organized within the three main sections of the book.

Due to an interdisciplinary approach necessary to adequately address and characterize poorly understood subsurface environments, many authors were involved in the work. As a result, organization and flow of information, as well as writing style and quality, differ from chapter to chapter. However, the concepts are generally presented in a concise and well-written manner.

Scott R. Stewart

Ecosystem Science and Restoration Services, Blasland, Bouck, and Lee, Inc., 2300 Eastlake Avenue East, Suite 100, Seattle, WA 98102, U.S.A., email ssstewart@bbl-inc.com

ment in the Pacific Northwest. Wright, D. J., and A. J. Scholz. 2005. Oregon State University Press, Corvallis, OR. 317 pp. (xii + 305). \$29.95 (paperback). ISBN 0-87071-057-5.

Recognizing the Autonomy of Nature. Theory and Practice. Heyd, T., editor. 2005. Columbia University Press, New York, NY. 240 pp. (x + 230). \$45.00 (hardcover). ISBN 0-231-13606-4.

Tigerland and Other Unintended Destinations. Dinerstein, E. 2005. Island Press, Washington, D.C. 279 pp. \$25.95 (hardcover). ISBN 1-55963-578-9.

Unruly Complexity. Ecology, Interpretation, Engagement. Taylor, P. J. 2005. The University of Chicago Press, Chicago, IL. 310 pp. (xxi + 289). \$25.00 (paperback). ISBN 0-226-79036-3.

Yellowstone to Yukon: Freedom to Roam. Schulz, F. 2005. The Mountaineers Books, Seattle, WA. 192 pp., 200 color photos. \$34.95 (hardcover). ISBN 0-89886989-7.