

ecotourism's numerous impacts on marine mammals and underscores the tremendous amount of research that has been conducted on this type of ecotourism. The chapter touches on the importance of codes of ethics in ecotourism to induce behavioral change, which is a topic not covered extensively in the other chapters.

Chapter 7 (Tablado and D'Amico) moves back to a focus on terrestrial animal tourism, and is balanced by negative effects of animal tourism (e.g., habitat degradation) and positive effects (education and proenvironmental behaviors). Some may question the choice to focus on penguins for an entire chapter (Ellenberg's Chapter 8) but, again, this shows the depth and range of research on specific taxa in ecotourism. The next chapter (Zacarias and Loyola) pushes the boundaries of the monograph outside its biological mandate, and has a character not unlike much of the research on ecotourism from the social science perspective. Chapter 10 is a summary of best practices represented in 24 different guidelines drawn from the previous chapters, which acts as an effective synthesis. The final chapter, although short, offers suggestions about where research ought to go in the future. The editors argue that naturalists have a "field feeling" and that these observations are rarely published. However, the *Journal of Ecotourism* has a Field Notes section that regularly publishes this type of information.

Although the editors configure it is a positive in the introduction, a drawback of the book is the redundancy among chapters on impacts to specific taxa, as well as on specific themes (e.g., habituation). There is also the argument that the exclusion of a focus on flora in a volume on biology is a detriment. Furthermore, readers would no doubt appreciate an index because of the breadth of topics covered.

Notwithstanding these few problems, I highly recommend this book as an authoritative guide on the topic. It is accessible for both natural scientists and social scientists, and is attractive in its layout and inclusion of several color photographs that reference a number of important themes.

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#### WHY ECOLOGY MATTERS.

By Charles J. Krebs. *Chicago (Illinois): University of Chicago Press.* \$75.00 (hardcover); \$25.00 (paper). ix + 193 p.; ill.; index. ISBN: 978-0-226-31801-1 (hc); 978-0-226-31815-8 (pb); 978-0-226-31829-5 (eb). 2016.

I teach part of a year-long introduction to biology course, covering ecology and evolution. Most of the 500 students in the class are not, however, interested

in becoming ecologists or evolutionary biologists. Instead, they are usually targeting careers in the health sciences. Thus, one of my foremost challenges is to demonstrate to my students that ecology and evolution are relevant to their future careers and, more generally, to many of the decisions they will make during their lives, regardless of their particular vocations. To this end, I eschew many of the classical case studies used to teach ecology and evolution (e.g., snowshoe lynx population cycles, industrial melanism in pepper moths), and instead try to find topics and case studies that resonate with as many of my students as possible.

This book provides a wealth of ideas and examples that do exactly that. And the presentation is perfect for a nonspecialist audience. The text is uncluttered—free from unneeded jargon, grounded in intuitive verbal arguments, and bolstered with plots of data from the field. Graphical depictions of simple conceptual models are occasionally presented to complement the verbal explanations, but the text is entirely free of mathematical models, which can wrinkle the noses of students who are not quantitatively inclined. The result is a presentation that is lucid, concise (the main text is only 170 pages), and effective.

The author's goal of explaining to readers "why ecology matters" was clearly the central motivation in choosing the topics to be addressed (the volume tackles 12 main issues) and the examples chosen to illustrate the central messages. For example, the discussion on limits to population growth treats pests (forest-defoliating insects) and an endangered species (a rare orchid), and finally touches on humans and the role of declining birth rates in slowing, and perhaps soon reversing, the explosive growth of the global human population. Examples from agriculture and fisheries biology are highlighted repeatedly, as when overexploitation of the cod fishery is used to illustrate the tragedy of the commons. Not just *Pisaster* starfish, but also humans are introduced as examples of keystone species, reviewing the role of human populations in Pleistocene extinctions of our global megafauna. The book also includes a chapter on how human actions are driving rapid evolution in pest and pathogen populations, touching on evolved resistance to the antibiotics that many of my premed students aspire to be prescribing soon.

Thus, I think the volume should find two audiences. The first is general readers who wish to obtain a nontechnical introduction to the importance of ecology. The second is students who may indeed be building a career in the life sciences, including even some aspiring ecologists, but who may have used more traditional ecology textbooks that devote so much time to theory and examples from pristine ecosys-

tems that the benefits human societies derive from applications of ecological knowledge are not as apparent as they should be.

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THE THEORY OF ECOLOGICAL COMMUNITIES. *Monographs in Population Biology, Volume 57.*

By Mark Vellend. Princeton (New Jersey): Princeton University Press. \$49.95. xi + 229 p.; ill.; index. ISBN: 978-0-691-16484-7. 2016.

Sir John Lawton summarized the state of community ecology when he wrote: “[t]he contingency [of ecology] becomes overwhelmingly complicated at intermediate scales, characteristic of community ecology, where there are a large number of case histories, and very little other than weak, fuzzy generalisations” (1999. *Oikos* 84:177). Although classical community ecology is replete with intriguing diversity patterns, ecologists have repeatedly found that these patterns fall apart somewhere on the globe. Perhaps even more vexing is the fact that for the more robust empirical patterns ecologists have compiled a litany of not mutually exclusive hypotheses to explain the pattern. Take, for example, the well-known latitudinal diversity gradient, whereby diversity decreases as we move poleward on the globe. This large-scale pattern is accompanied by a staggering list of possible causes, including heterogeneity, productivity, climate stability, and evolutionary history to name a few with none being obvious leading contenders. In this thought-provoking and clearly elucidated book, Vellend argues that underneath the grab bag of possibilities common to community ecology lies a coherent and general theory that will aid future research.

To get at this level of generality, this volume looks at classical community ecology through the lens of population genetics theory. The author argues that selection, dispersal, drift, and speciation can be thought of as high-level processes, and that these processes, in shifting combinations, underlie community ecology. Vellend navigates the complexity of issues like scale, and the network of species interactions, by adeptly focusing his goal on understanding “horizontal” community ecology patterns (i.e., within trophic-level patterns). To get to a general theory that speaks to all community ecology—at least of the horizontal kind—he first differentiates low-level processes (e.g., competition, predation, and abiotic conditions, among others) from high-level processes (i.e., selection, drift, dispersal, and speciation), where the high-level processes importantly contain the low-level processes. This allows Vellend to collocate community ecology under one large umbrella.

In a simplified sense, he argues that although low-level processes are often highly case specific, grouping each case within the framework of the high-level processes achieves unification. This is an important, if simple, idea and one that has been largely ignored.

Along the way, the author uses these macroscale processes to explain a number of patterns in community ecology, including a tidy rephrasing of meta-community ecology within his guiding framework. For me, I found that Vellend’s general theory did what it was supposed to do—it drove me to attempt to generally employ the framework to explain different community ecology phenomena. Relatively recent ideas on extinction debt and long transients, for example, made me think about how “drift” can rear up to dominate ecological communities. Long transients, including the specific case of extinction debts, likely arise when various local processes are such that selection (here, I am referring to Vellend’s definition of selection) is either muted or overwhelmed by stochastic processes in local communities. If extinction debt is common with increasing human impacts, say, then is there something general about the Anthropocene that is making the process of drift dominate? My ruminations on extinction debt aside, the point here is that the author’s general theory is helpful in organizing and thus thinking about big picture issues in ecology.

If there is a weakness in this approach, it is that the theory is so general, so simple, that it feels almost trivial at times. This becomes apparent in the empirical chapters when data-driven questions are asked so broadly (e.g., does community composition or mean trait values of a community change with environmental conditions across time?) that the empirical answers feel obvious (“yes, this pattern occurs but not always”) and so not particularly empowering for the science. To be clear, there is no problem with addressing these types of extremely broad empirical questions. In fact, this is arguably the correct thing to do, but the rich area lies in delineating the reasons why the empirical patterns break down. This more penetrating question has now returned to the complicating ecological “contingencies” that Lawton referred to in the quote above. Whether the very general theory of this book is extremely useful to ecology, or not, remains to be seen and likely depends on whether we can use its intuition to bridge the local mess of mechanisms to the extremely general framework of Vellend. In other words, I think the success of this volume, in terms of guiding future research, depends on whether these simple ideas can help produce an intermediate theory that is logically pluralistic, but simultaneously finite and comprehensible. This important intermediate ground