

ecological connections, I found it cumbersome to get through the chapters since they were not organized in ways that facilitated my own discoveries. This may be different for incoming students, but I can imagine alternative organizations that would capture and maintain student interest and avoid significant repetition. I had difficulty following their decision to separate the topic of climate change from climate variation over time, or decouple competition or mutualism from communities, to name just two examples. This may be on purpose if units are intended to be used as stand-alone teaching modules, but this is not how I evaluated the volume.

Despite the length of the textbook, I am missing belowground and microbial interactions (particularly plant-soil feedbacks) and touching on it under decomposition or aquatic environments seems insufficient. Although I appreciated the glossary, I found various problematic entries including Allee effects, biotic resistance, habitat loss, ecosystem services, disturbance, or competition (which occurs between individuals and not species). I remember well that as a student I was inspired by a textbook called *Ecology: Individuals, Populations, and Communities* by Begon et al. (Boston: Blackwell Scientific Publications). I read the second edition published in 1990 cover to cover and I took it off the shelf and compared some writing and organization with the current version of *Ecology*. Nearly a quarter century has passed and much new insights, even disciplines, have emerged, but I could immediately see by just reading a few paragraphs why I was, and still am, enamored with the old, but not fully outdated 1990 version. One example will suffice: Cain et al. define communities as “groups of interacting species that occur together at the same place and time” (p. 359), while Begon et al. state that communities can be viewed as a “composite of the lower levels of organization (individuals and populations)” (p. 613), a much more appropriate articulation of the actors.

There is much to like about the writing and the visual appeal of Cain et al.’s *Ecology* as well as the appeal of fascinating natural history. But I would have liked a more cohesive and seamless transition connecting concepts, case studies, and ecology as a science to maintain and increase the fascination of undergraduates.

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HOW TO DO ECOLOGY: A CONCISE HANDBOOK. *Second Edition.*

By Richard Karban, Mikaela Huntzinger, and Ian S. Pearse. Princeton (New Jersey): Princeton University Press. \$24.95 (paper). xv + 182 p.; ill.; index. ISBN: 978-0-691-16176-1. 2014.

Graduate school is where larval scientists learn to conduct research, and the experience is frustrating for all of them at least some of the time. This book, which evolved from Karban’s graduate course at the University of California-Davis, distills the core procedural lessons of a PhD program in ecology and presents them in an engagingly written, easily digestible packet. The chapters progress through each of the major components of the profession: how to identify questions and develop testable hypotheses, different ways to generate and analyze data, strategies for reading and writing papers, tips on interacting with peers and communicating in various media, how to organize grant proposals and, ultimately, get a job. These are general attitudes and guidelines, not solutions to specific technical problems.

For the last two years, I have assigned Chapter 2 of the first edition of this book (R. Karban and M. Huntzinger. 2006. Princeton (NJ): Princeton University Press) to my undergraduate ecology class. That chapter, Posing Questions (or Picking an Approach), provides an accessible overview of the major methodologies employed in ecological research, and I especially like its emphasis on the importance of natural history: “ecology as a discipline would be improved if we were encouraged to learn more about nature by observing it first and manipulating and modeling it second” (Karban and Huntzinger 2006:17-18). However, I had never read the rest of the volume. I expected to have reservations: there are many ways to “do ecology,” and any concise handbook will inevitably reflect the particular preferences and prejudices of its authors. I predicted that my review would be positive, but critical of the premise that academic ecology is a game played according to a codifiable set of rules. By the time I was two-thirds finished reading, I had ordered a copy for everybody in my laboratory, and I am going to make certain that all of them read it.

The reservations I had foreseen never materialized for three reasons. First, I agreed with the authors’ philosophy and almost all of their advice, which makes it difficult for me to quibble. Second, the authors preempted my objection that specifying rules of the game risks stifling young scientists’ creative and revolutionary impulses: Chapter 9 is dedicated to the proposition that there are costs, as well as benefits, to coloring strictly inside the lines. In this way, the authors exemplify a principle

from Chapter 8: “Anticipate questions that the reviewers are likely to have and address them” (p. 159). Third, I discovered that this volume contains concentrated wisdom that I want my advisees to absorb, but that would take me years to dispense to them individually and piecemeal. I also realized that the book is likely to be more persuasive to my students than any advice from their advisor, who is himself relatively new in the business and occasionally out to lunch. Reading this volume will save all of us time and emotional energy.

This publication is written by and for experimentally inclined field biologists; theoretical ecologists would have written a very different book. A third edition might even address some of the differences in mindset and approach between theoreticians and empiricists (or, indeed, between ecologists and social scientists), which frequently inhibit communication and collaboration across disciplinary boundaries. But I can think of no other omission worth noting. This is an enormously valuable publication, and anyone beginning or aspiring to a graduate degree in ecology really should read it.

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EXTINCT MADAGASCAR: PICTURING THE ISLAND'S PAST.

By Steven M. Goodman and William L. Jungers; plates by Velizar Simeonovski. Chicago (Illinois): University of Chicago Press. \$45.00. xii + 206 p. + 20 pl.; ill.; index to Malagasy place-names and index to scientific names. ISBN: 978-0-226-14397-2 (hc); 978-0-226-15694-1 (eb). 2014.

ATLAS OF SELECTED LAND VERTEBRATES OF MADAGASCAR.

Edited by Steven M. Goodman and Marie Jeanne Raherilalao; maps and analyses by Herivololona M. Rakotonratsimba; design and typesetting by Malalarisoa Razafimpahanana. Antananarivo (Madagascar): Association Vahatra; distributed by University of Chicago Press, Chicago (Illinois). \$125.00. iv + 290 p.; ill.; index. ISBN: 978-2-9538923-5-2. 2013.

Madagascar, the fourth largest island in the world, is home to one of the world's greatest concentrations of endemic biodiversity—and some of that biodiversity has become extinct within the last 400 years. Both of these books address the extraordinary Madagascar fauna and its ecosystems. Based on molecular evidence, the lemurs arrived over 60 million years ago and the other mammals and birds followed 20 to 30 million years later. However, the fact that there are no hard fossils found on Madagascar from about 80 million years ago until 30,000 years ago casts a bit of mystery onto

the origins and evolution of all modern Malagasy taxa.

The book, *Extinct Madagascar: Picturing the Island's Past*, reviews the extinct Malagasy megafauna—giant crocodiles, aardvarks, tortoises, birds, mammals (including hippopotami), and lemurs—that shared the ecosystems. This volume targets a series of fossil excavation sites found throughout the island, describing and illustrating each site and the subfossils that have been found there. It is startling to realize that these giant animals were abundant throughout the island from north to south, and died out only within the past few centuries. Most of the excellent illustrations by Velizar Simeonovski are black and white, giving the book an atmosphere of ancient times. The 20 color renderings of each ecosystem and its fauna are clustered in the center of the volume and bring the fossil communities and their habitats to life.

Several theories about the extinction of Madagascar's megafauna are presented in this book. The late arrival of humans with fire and iron certainly had an effect in Madagascar, echoing the theme of the demise of the megafauna in the Americas, Asia, Australia, and Europe. An alternative explanation given is that extinctions of the megafauna are a result of a long episode of climate aridity and an ancient tsunami. Many of the subfossils have been found to have cut marks best explained by butchering with a knife, suggesting hunting by humans (V. R. Perez et al. 2005. *Journal of Human Evolution* 49:722–742). Only the large mammals, preferred for hunting, are extinct, while the small species have survived to the present day. In light of the present-day annual burning, it is difficult to imagine that the arrival of humans was not the prime driver of the immense destruction of natural habitat that led to the megafauna extinctions. Further research will shed light on the extinction causes. This volume is written in nontechnical language easily understood by a general audience, but it is also quite scholarly and detailed.

In contrast, *Atlas of Selected Land Vertebrates of Madagascar* is written as a reference book and is basically a compilation of 30 years of surveys of each species of living endemic birds, bats, carnivores, rodents, tenrecs, and two groups of reptiles. This volume contains more than 200 maps, each presenting all known locations of each targeted species, and offers a comprehensive assessment of current vertebrate diversity in Madagascar. This includes the diversity of ecosystems including climate information. Although I acknowledge and admire the 30 years of survey data that are captured in this publication, and praise the authors on their thorough and rigorous documentation, I have two complaints. First, there are no photo-