

Book Reviews

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AN INORDINATE FONDNESS FOR SHRIMPS

Bauer, Raymond T. 2004. **Remarkable shrimps: adaptations and natural history of the Carideans**. University of Oklahoma Press, Norman, Oklahoma. xvii + 282 p. \$59.95, ISBN: 0-8061-3555-7 (alk. paper).

Many biologists can identify their first, engaging encounter with the organisms that subsequently became the focus of their research programs. Raymond Bauer begins this book by telling readers the story of his first encounter with caridean shrimps, in which he was sufficiently fascinated as to begin more than three decades of research into their biology. This book is primarily a review of aspects of caridean biology in which he has particular expertise or interest. His principal goals, as described in the preface, are to synthesize current knowledge on these topics and to publicize observations and ideas that he hopes will stimulate further work on these animals. He succeeds nicely in these aims, especially in chapters that cover his own research.

The book's first three chapters comprise an excellent introduction to the carideans, including systematics, external form, and, in Chapter 3, a very useful overview of the natural history of the 28 families of caridean shrimps. The next five chapters, focused on topics in which Bauer has considerable research experience—grooming, coloration, and various aspects of reproduction and life histories—are excellent mini-reviews that contain many intriguing ideas for future research. One example is the suggestion of a correlation between grooming ability (which varies among caridean families, as

judged by the number of grooming appendages) and species-level diversity; also of interest are several hypotheses on the origins of protandry and the evolution of mating systems (Chapters 7 and 8). In addition to these suggestions for further research, Bauer regularly points out gaps in our knowledge of caridean natural history. These are among the most interesting chapters in the book.

Less useful are the final three chapters in the book, on symbioses, phylogeny, and fisheries and aquaculture. These include few of the original observations that greatly enrich earlier parts of the book; instead they are simply reviews of the topics, but less complete and synthetic than those of earlier chapters.

Remarkable shrimps is well illustrated with line drawings (especially useful in the introductory chapters) and 11 color plates. The writing is clear and easy to read, and the text contains only a few minor misspellings. Though I found the final three chapters unsatisfying, the rest of the book contains more than enough information and ideas for future research to make it of value and interest to marine biologists and invertebrate zoologists at all levels.

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MODERN CIVILIZATION AS MESOPOTAMIA

Ehrlich, Paul R., and Anne H. Ehrlich. 2004. **One with Nineveh: politics, consumption, and the human future**. Island Press, Washington, D.C. 447 p. \$27.00, ISBN: 1-55963-879-6 (alk. paper).

The title of this book by two eminent ecologists refers to their belief that the U.S. and other Western countries are headed toward an environmental collapse as total as that experienced by ancient civilizations such as Mesopotamia. The analogy was selected by the authors because the U.S. and other nations in Iraq are fighting near the ruins of these lost cities. The basic arguments of the book can be found in most courses in ecology, conservation biology, and environmental science, and in Paul Ehrlich's book of three decades ago, *The population bomb* (1975. Rivercity Press, Rivercity, Massachusetts): there are too many people in the world (and their

numbers are growing), per capita consumption of resources is too high (especially in the U.S.), and the unequal use of resources between rich and poor countries is unfair, destructive, and provides the inducement for war. They predict that the end result will be an environmental collapse, with catastrophic economic and social consequences.

The book is written in a breezy, fast-paced style; the authors refer to topics briefly, before passing on to something else. Here is the latest word on environmental, population, natural resource, and political issues. The book is filled with fascinating examples, unusual insights, and perceptive observations. However, because the book lacks any photos, graphs, or tables, and rapidly presents complex material, it is clearly not designed for the general public or non-scientists. In order to appreciate much of the content, readers must have a good background in environmental issues. Instead, the book is well suited to an advanced undergraduate- or graduate-level dis-

discussion course. The book will also be read by committed environmentalists who will use the arguments presented here in political debates. It reads like a series of 11 irreverent lectures given by two famous professors to a dedicated group of students and supporters, which should generate lively debate among students and other readers. The book comes with a huge set of notes, so the meat behind each passing remark can be checked and examined in depth.

In the book, the Ehrlichs describe what they believe to be the primary sources of the environmental problems faced by the world. They believe that the politicians who could address environmental problems are largely controlled and corrupted by corporations and wealthy individuals, and that these corporations and individuals are primarily interested continuing past patterns of exploitation. They further believe that the media is deliberately hiding the extent of the problems faced by the world, and that they are doing so as a direct result of the corporate control and corruption of the media. Similarly, in their view, large global organizations, such as the World Trade Organization, the World Bank, and the United Nations, are acting on behalf of wealthy countries and corporations to exploit poor people and poor countries, often at the cost of environmental destruction. They believe these organizations are ineffective at dealing with environmental problems, even when the organizations focus on the environment. Given this pessimistic view of the world, it was not surprising to read on the final page that the Ehrlichs describe themselves as being "quite depressed" while writing this book.

In the final chapters, they place their main hope for dealing with the environmental crisis on corporate and political reform, advocating for greater citizen control of the political process. They also argue for increased democratic procedures and transparency in global organizations. How these reforms might be implemented was not made clear in the book. If the organizations are corrupt, how could they be expected to reform themselves?

The authors also argue for a proposed Millennium Assessment of Human Behavior to address the relationship between human actions and environmental problems. This assessment would be a giant international conference of poli-

ticians, environmentalists, business people, social scientists, ethicists, and public interest groups, perhaps under the auspices of the United Nations. This is definitely a big idea, and worth talking about. It remained unclear whether or not such a strange-sounding conference could actually take place, and what changes it could realistically make. It also was unclear as to who would or should be pushing for such a conference, and how any reforms, such as population control, reduced resource consumption, and more equitable distribution of resources, would be implemented.

In my own mind, an environmentally aware citizen has to deliberately live his or her life in a responsible manner, in addition to becoming involved in the political process. In Boston in July 2004, the Thoreau Society had a major symposium on the 150th anniversary of the publication of *Walden*. The participants spoke of the need to live simply, and to apply Thoreau's philosophy to individual life choices. This call for personal responsibility is absent from this book. By placing little or no emphasis on personal responsibility, the authors miss an important opportunity to reach a wide audience and give ordinary citizens something to do themselves. Such personal choices often catalyze political action at larger scales.

The call for political reform is further weakened by their repeated and often personal attacks on politicians, corporations, global organizations, and the Catholic Church. Also, President Bush is repeatedly accused of waging a "war on the environment, women, international governance, and civil liberties." As a consequence, it is a good bet that the current U.S. government and the political allies of President Bush will not promote the reforms proposed by the Ehrlichs. As a result, this book will be read, discussed, and used mainly by committed environmentalists of a particular political orientation, rather than contributing to a general, non-political consensus on environmental issues.

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LAKE TROUT AND BOREAL SHIELD WATERSHED INTEGRITY

Gunn, John Maxwell, Robert John Steedman, and Richard Alan Ryder, editors. 2003. **Boreal shield watersheds: lake trout ecosystems in a changing environment**. CRC Press, New York. xxiv + 501 p. \$139.95, ISBN: 1-56670-646-7 (alk. paper).

The book *Boreal shield watersheds: lake trout ecosystems in a changing environment* is the second book in the CRC Press series on Integrative Studies in Water Management and Land Development. The series editor, Robert France, states "[e]cological issues and environmental problems have become exceedingly complex" and that "it is hubris to suppose

that any single discipline can provide all the solutions for protecting and restoring ecological integrity." And thus the premise for the series and its ultimate goal are clearly laid out.

This book assembles a wide range of experts that have conducted research in a variety of scientific disciplines relevant to boreal watersheds, limnological processes in these lakes, or lake trout management specifically. The editors attempt to use lake trout as a vanguard for gauging the ecological integrity of boreal watersheds and this is the sub-theme woven throughout the book. Of course, an argument can be made against using lake trout to gauge boreal ecosystem health as they have long generation times and thus

may not be the best candidates as a quick-response indicator species. However, the editors pragmatically focus on lake trout because they are widely found throughout the Boreal Shield and have been greatly studied in efforts to protect this high value (i.e., monetary) commodity. The implied goal was to compile relevant research on physical, biological, and sociological processes in the hopes of lending insight into how to maintain ecological integrity of these systems. The challenge for the editors was to attempt to integrate a series of disciplines into a cohesive text to further our understanding of aquatic boreal ecosystems and lake trout.

Chapters of the book are broken into thematic areas. Introductory chapters help put boreal watersheds and lake trout into perspective relative to the structure and function of these systems. The first chapter "Lake trout, the Boreal Shield, and the factors that shape lake trout ecosystems" does an excellent job describing the Boreal Shield and the glacial events that created this region. However, the chapter provides only a short introduction to lake trout rather than the thorough introduction that would have helped readers unfamiliar with the ecology of this species. In addition, in the first chapter the authors state the "book focuses on a group of about 3000 small lake trout lakes" yet several chapters clearly go beyond this scope and thereby detract from the book's intent. The second chapter is among the most enlightening of the text, synthesizing the history and evolution of lake trout in North America that helps explain their current biogeographical distribution. The third chapter outlines rehabilitation of lake trout in the Great Lakes, but while enlightening, goes beyond the scope of small boreal watersheds. While the attempt is to provide historical insight into management issues affecting the survival and attempted recovery of lake trout in the Great Lakes, it is difficult to generalize these findings down to small forested boreal watersheds that have quite different functional processes.

The introductory chapters are followed by sets of chapters entitled (1) "Environmental factors that affect Boreal Shield ecosystems," (2) "Biological effects and management reactions," (3) "Models and issues associated with ecosystem management," and (4) "Synthesis." In the first of these chapters, the extent of perturbations across boreal watersheds is made quite clear: 60% of Boreal Shield lakes are affected by timber harvesting activities whereas other threats (e.g., urbanization, agriculture, mining), while potentially important locally, have a relatively small geographic reach. An excellent chapter on the effects of phosphorus and nitrogen on lake trout production and habitat provides a nice overview of nutrient-production dynamics in these systems and nicely conveys the relevance of these relations to lake trout. Other chapters in this section, while well written, are less easily integrated into the spirit of the text. A chapter on lake trout habitat volume is well done, but it seems out of context as readers unfamiliar with this literature may struggle to identify its relevance; the authors do not provide the necessary context or linkage for this topic. Perhaps it should have been integrated into the two following chapters on nutrients and dissolved organic carbon, where alterations to these limnological characteristics can affect lake trout habitat volume. Another chapter addressing the impact of reservoirs on lake trout fo-

cuses on the effects of water level fluctuations on spawning habitat in these large systems. While this topic also appears to breach the scope of the book (i.e., small boreal lakes), this chapter does a nice job of suggesting possible management alternatives to new reservoir construction, such as introducing deep-spawning populations of lake trout into these environments whose spawning depths exceed the depth of water level fluctuations. In contrast, a well-written chapter on acid deposition focuses on the northeastern U.S.—hardly the Boreal Shield. Perhaps the information is easily generalized to the Shield lakes of interest, but the authors do little to help facilitate that possibility.

Topics in the section "Biological effects and management reactions," include effects of sport angling harvest and stocking on lake trout populations, species introductions and their effects on North American Shield lakes, and effects of forest roads on spawning habitat and harvest. These chapters offer a wealth of information on their respective topics. The chapter on effects of logging roads does a particularly good job helping understand the ecology of lake trout (which may have been more useful in the first chapter) and how logging roads affect lake trout. On the other hand, the chapter on species introductions discusses a wide array of invasive species, but there is little focus on effects on lake trout specifically. Finally, the section on "Models and issues associated with ecosystem management" offers two excellent chapters: one on the effects of climate change on lake trout populations (which should have been carried further) and a chapter on how to best monitor lake trout populations (which is extremely detailed). Both chapters are "must reads" for university courses dealing with these topics.

Overall, the book consolidates information on threats to boreal ecosystems and lake trout attempting to create an interdisciplinary summary of ecosystem function and effects of perturbation. As such, the text would be valuable for researchers and resource managers as part of a comprehensive library; most chapters include a very substantial literature cited section that adds to the value. However, by attempting to tackle so many topics with experts at varying degrees of expertise and disciplines, the result is that the chapters vary in their quality of presentation such as the degree of detail presented. The book also vacillates in purpose between targeting lake trout per se, and then at times more broadly targeting Boreal Shield ecosystems but at times not linking the two which would have been more enlightening. Perhaps a chapter on lake trout bioenergetics could have provided a context around which other authors could orient their chapters on.

This effort clearly breaks some new ground and holds promise that additional high-quality efforts in the future will benefit from the work contained in this book. In assessing the current state of large-scale, integrative efforts aimed at understanding and managing ecosystems, France laments "[b]ooks like these are rare, but shouldn't be"; his efforts with this series to help remediate that situation are to be commended. This statement is both disappointing and refreshing at the same time. On the one hand, the scientific community has the daunting challenge of entering an era where we can no longer afford to ignore these large, complex problems exacerbated by burgeoning human populations. And

on the other hand, efforts such as this are perhaps the early signs of efforts underway attempting to maintain ecological integrity of ecosystems. The question left for future generations will be whether efforts of this type can bring ecological science far enough and quick enough to sustain ecological integrity; it is clearly a start.

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ECLECTIC COLLECTIONS FROM DYNAMIC MAMMAL COMMUNITIES

Zabel, Cynthia J., and Robert G. Anthony, editors. 2003. **Mammal community dynamics: management and conservation in the coniferous forests of western North America.** Cambridge University Press, New York. xxi + 709 p. \$160.00 (cloth), ISBN: 0-521-81043-4; \$60.00 (paper), ISBN: 0-521-00865-4.

This dense text is full of detailed information on just about every aspect of mammal communities in western forests and provides a good reference book for researchers, college students, conservation organizations, and land managers. The 20 chapters are divided into three sections. The first section “Management and conservation issues for various taxa,” contains nine chapters that comprise the first half of the entire book. While this section is very informative, it is perhaps the driest due to the descriptive nature of the various chapters. For example, besides a chapter describing the various forest and woodland types of western North America, there are chapters on the ecology of bats, of terrestrial small mammals, of arboreal rodents, of small and mid-sized carnivores, of large carnivores, and of ungulates. As is common with most edited volumes, these chapters summarize and review previously published material rather than presenting new material and each is well cited at the end of the individual chapters for easy referencing.

There is plenty of excellent information in this section regarding specific habitat needs of mammal species, such as the importance of standing snags in forests for flying squirrels and bat roosts, and the importance of forest structural features (vertical and horizontal) in providing cover and nesting places for numerous mammals from small to large. In addition, this chapter examines the taxonomic confusion surrounding the pine tree voles. Numerous species are identified as keystone species (flying squirrels, large carnivores, small carnivores [especially in the absence of large carnivores], and ungulates), and other specialist species are identified as indicators of forest ecosystem health (marten, fisher, wolverine, lynx, river otter, and mink).

The chapters in this section do vary in their organization and focus. The small mammal chapters focus on diet selection and breadth, responses to food availability, effects on forest regeneration, habitat associations, and responses to forest management, while the meso-carnivore chapter focuses on generalists versus specialists and the changing approaches to carnivore conservation from their value for skins to their role

in ecosystems. The large carnivore chapter focuses on current status, ecological roles, landscape management, interactions with humans, and restoration, while the ungulate chapter devotes much attention to population dynamics and density-dependent regulation.

No species has gone extinct in western forests in modern times (except on a local level) despite the decrease in late-successional forests. While there are some strong habitat associations with old growth forests (e.g., arboreal species), an obligatory relationship has not been well established for any species. However, data are lacking on some species, and mammalian communities in secondary growth do not appear to be converging on those of old growth. Logging appears to be compatible with the survival of most mammal communities, especially if it is done in such a way as to maintain habitat heterogeneity and structural features (e.g., smaller clear cuts, non-removal of coarse woody debris, thinning practices that leave standing snags and canopy intact). The wolverine, however, is generally excluded by human activities.

The second section of this book “Community and ecosystem relations” contains an eclectic mix of six chapters that vary in content and style. First is a very interesting review of the “web-of-life relationships” among, for example, fungi, their tree hosts, flying squirrels, and spotted owls. This particular chapter breaks out of the western forest mold and compares fungi and small mammal relationships in the U.S. and Australia. The next chapter on the ecology of coarse woody debris (CWD) is equally interesting and highlights the need for a more complete analysis of the effects of size class, abundance, and decay of CWD on mammals. The authors make a call to determine the historic range of variability in CWD in western forests under natural disturbance regimes and they also give specific steps for CWD management approaches. A chapter on the ecological role of tree dwelling mammals reiterates much previous information from part one, while the chapter on ungulates, predators, and plant communities includes in-depth results from studies in Yellowstone and Rocky Mountain National Parks. These studies show that some plants (6 out of 10) compensate for intermediate grazing and hence a grazing optimum does exist but also explain that grazing can result in promotion of nutrients in grasslands and reduction of them for short willow-type vegetation. Also included is a section on population modeling of the effects of wolf re-introduction on ungulates. Next follows a summary of the lynx-hare experimental studies in Kluane, Yukon that elucidates the complex relationships ex-

isting in that ecosystem and proposes the hare, not the lynx, as the keystone species. Hares appear so numerous, though, that I question whether they fit the definition of a keystone as a species whose impacts on an ecosystem are large relative to their abundance. Lastly, a thorough review on mammals in riparian areas follows including detailed experimental designs for future research on small mammals.

The last short section, "Conservation issues and strategies" contains four chapters (plus a synopsis chapter), two of which concern issues of fragmentation and connectivity. The chapter on using genetic tools to estimate connectivity for mammals in a landscape fragmented by logging contains a nice review of genetic measures and good illustrative case studies which could be applicable anywhere in the world. The next chapter contained a short reminder of the evolutionary and behavioral reasons why certain animals may be better dispersers than others, and while interesting, seemed slightly out of place or ad hoc. Lastly the functional diversity of mammals is examined in a thorough review of key ecological functions (KEF), functional profiles, functional redundancies, functional link species, etc. across western forest types. This unique perspective uses existing databases and produces maps of KEF for use by managers to locate specific areas to prioritize for restoration and maintenance of specific ecological functions. The authors argue that this approach is advantageous over the keystone species concept because it is explicit about the mechanism underlying function and structure of ecosystems.

Conservation strategies for the various mammal communities are as varied as the species within them. Major conservation themes that emerge from this book are the importance of maintaining habitat heterogeneity in timber practices, the importance of understanding the influence of mammals on each other, the importance of identifying functional roles and keystone species, and the importance of future research on dispersal abilities and connectivity across fragmented landscapes. In general, I would describe this book as slightly idiosyncratic. It varies from purely descriptive to quantitative and contains chapters that seem, at times, loosely connected. Someone studying forest ecosystems in other places in the world might not get much out of the first half unless they are working on a similar species or were interested in comparative analysis. That said, the mammal review chapters will get the reader up to speed on numerous western mammal species. The mix of chapters in the second half of the book undoubtedly has something for everyone, but perhaps not everything for someone. I found this suite of chapters generally good and would use them as a jumping off place to explore a subject (e.g., functional diversity, lynx-hare dynamics, ungulate regulation, genetic measure of connectivity) more thoroughly.

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