

Book Reviews

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Amboseli elephants—dividends from a long-term incentive

Moss, Cynthia J., Harvey Croze, and Phyllis C. Lee, editors. 2011. **The Amboseli elephants: a long-term perspective on a long-lived mammal.** The University of Chicago Press, Chicago, Illinois. xiv + 383 p. \$65.00, ISBN-13: 978-0-226-54223-2 (alk. paper).

Key words: Amboseli; behavior; conservation population dynamics; reproductive strategies; Savannah elephants.

This compendium stands out as one of a kind. It elegantly brings together just about everything that has been learned during some 38 years of intensive fieldwork on the ca. 1500 elephants that dominate Kenya's Amboseli ecosystem. Everyone fascinated by and interested in elephants, or for that matter in any long-lived species, will benefit from reading this book. Much of the data presented here are new even though some of the interpretations of these data have already been published in the peer-reviewed scientific literature. For years to come, scientists working on African elephants in their natural environment will be able to use this compendium as a standard reference, and may even replace some of their earlier reference materials with the information presented here. As editors and senior contributors, Cynthia Moss, Harvey Croze, and Phyllis Lee certainly ensure a pleasurable and intensive reading and learning experience. For the editors and some of the other 18 contributors, this book reflects on a near life-time occupation. The perseverance of everyone that maintained the world-renowned Amboseli Elephant Research Project (AERP) certainly paid off, and this collection of 22 thoroughly analyzed and well-edited scholarly papers, structured in five parts, addresses just about every aspect of the life of Africa's most iconic species. Most impressive is that the chapters are based on some 38 years of continuous and intensive observations.

The book is structured as five highly readable parts. Part 1 contains Chapters 2 to 4 and provides a thorough understanding of the physical and human context of the Amboseli ecosystem, with emphasis on temporal changes and the non-equilibrium nature of the system. Historical changes in elephant population size and population genetics are clearly presented. The three chapters (5 to 7) in Part 2 focus on habitat use, population dynamics, and spatial utilization and emphasize reproductive and survival flexibility in response to life in a relatively unpredictable and dynamic ecosystem. We now have a much clearer understanding of the demographic responses to changing environmental conditions that ensure the persistence of this population.

Chapter 5 elegantly introduces the reader to the drivers of sexual differences in habitat use, diet choice, and nutritional status, convincingly arguing in favor of requirements, rather than avoidance of interference competition, as the primary driver of sexual segregation in spatial use and feeding behavior. Like elsewhere in the book, conclusions are supported by interpreting some of the recent literature in support of inductive and deductive reasoning. Chapter 6 is exceptional in its analysis of rainfall-driven patterns of survival and fecundity, clearly illustrating how seasonal rainfall may affect conception, and the authors convincingly speculate that increased food availability

enhances female body condition and hence the likelihood of conception. "Nothing new," the reader may argue, but having it all put into context and extracted from long-term detailed observations adds credence to the generality. The illustration of the long-term demographic consequences of droughts experienced during the first two years of life is especially exciting and adds value to long-term studies, simply because such trends are hidden from most of us who rely on information gathered from short-term studies. Long-term observations also simplify analyses and reduce assumptions that complicate statistical inferences. Information given in boxes is extremely useful and most of the time well presented, but more detail on the procedures followed in calculating life tables would have been useful.

Part 3 (Chapters 8 to 11) starts with well-illustrated and detailed descriptions of typical body postures associated with signals, gestures, and general behavior. The updated ethogram of elephant behavior establishes the context for later analyses of social and reproductive strategies. Elephants live in complex societies with elaborate and multi-layered social networks that change over time. Joyce Poole's highly readable review on acoustic communication (Chapter 9) has all the attributes of a scholarly presentation and will for long be valued as an outstanding review. The same can be said for Karen McComb and her co-workers who deal with vocal communication and social knowledge in Chapter 10. Indeed, all of Part 3 presents outstanding contributions, by leaders in their fields, to the understanding of elephant behavior under natural conditions.

Part 4 deals with reproductive strategies and social relationships and may well be considered the core of new knowledge emerging from this exceptional long-term study. In the seven authoritative chapters that make up this part of the book, scientists working on elephants will recognize authors and co-authors such as Phyllis Lee, Joyce Poole, and Elizabeth Archie, who have once again delivered the goods and provide much new insight into reproduction, social dynamics, calf development, longevity, and the genetic relationships that confirm the matriarchal herd structure of elephants.

No book on elephants would be complete without considering the consequences that people may have for elephants and vice-versa. The four chapters of Part 5 address this issue, and provide a thorough account of the special relations between the Maasai people and Amboseli's elephants. Arguably more important, however, are the last two chapters that provide ethical arguments for the protection of elephants and convincingly argue against traditional elephant management approaches such as contraception, culling, and translocation. Keith Lindsay's point of view comes across strongly and reflects positively on his outstanding contributions to elephant biology and societal norms. The authors provide good reasons for their opposition to the commercial exploitation of elephants (trophy hunting and the capture of calves), and I am sympathetic to their views on dealing with human-elephant conflict.

Each chapter has been prepared as a stand-alone document. Research results, interpretations, and associated methodologies have been intertwined to improve readability without compromising credibility. In places though, this organization has resulted in lengthy text which is somewhat too comprehensive and may lack relevance to certain readers. At the beginning of most chapters, however, the authors include highly readable

and up-to-date reviews on the most recent understanding of the topic under discussion, thereby giving credence to their own interpretations of their research findings. This strategy raises the profile of the book to something much greater than a mere reflection on the natural history of Amboseli's elephants and introduces the reader to a range of biological sub-disciplines. The book is thus more than a compilation of published scientific papers. It is encyclopedic and will provide a standard reference for academics, students, and decision makers for many years to come. It illustrates how the impossible can be achieved through focused, long-term research initiatives. The book is also one of a kind for a large and long-lived mammal species. Cynthia Moss and the many scientists who supported

her vision need to be congratulated and thanked for their sterling contributions to our understanding of the biology of Africa's most significant icon, the elephant.

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History of Monterey Bay

Palumbi, Stephen R., and Carolyn Sotka. 2011. **The death and life of Monterey Bay: a story of revival.** Island Press, Washington, D.C. xii + 211 p. \$26.95, ISBN: 978-1-59726-435-8 (alk. paper).

Key words: environmental management; marine conservation; Monterey Bay, California; socio-ecological systems; trophic cascade.

The death and life of Monterey Bay: a story of revival should be the top candidate as a narrative for the next seminar you teach on socio-ecological systems. The book is divided into three sections that describe the forces that led to the devastation of the Monterey Bay ecosystem, the state of the ecosystem when it was at its very worst, and the recovery of the ecosystem.

Palumbi and Sotka commence their recounting in 1769 with the first true western settlement of Monterey Bay. At the time, this area was populated by native coastal people known as the Ohlone. Historical records and middens show that they used many ocean resources in their daily lives. Though clearly a key component of this socio-ecological system, Palumbi and Sotka give an incomplete treatment of the Ohlone. After telling the sad tale of the Ohlone's forced servitude to the Spanish, the authors neglect to relay the ultimate fate of the Ohlone people. Moreover, I would have welcomed more detail on how the Ohlone's use of marine resources influenced the ecology of Monterey Bay before, during, and after Spanish colonization.

The remaining content of the book's first section does a more thorough job of detailing the interaction between the people, culture, politics, economics, and ecology of Monterey Bay. The authors describe the lucrative trade for sea otter fur in the late 1700s that nearly extirpated the sea otters. Declared the royal fur of China, each pelt could fetch as much as \$100, which was enough to buy a house in San Diego. If used in a classroom setting, this case study begs to be compared to similar modern case studies, such as how the price of bluefin tuna influences fishing pressure.

The authors then discuss the whale hunts of the latter half of the 19th century that decimated whale populations. Next, they describe the fisheries of Chinese immigrants. Initially, the Chinese fishers harvested abalone until no more could be readily found. With this fishery collapsed, the Chinese fishers began catching finfish and later squid. The Chinese were pushed

out of each of these post-abalone fisheries by direct attacks from European-descended fishers and by a prejudiced governance system. In 1906, the homes of the Chinese fishers were burned to the ground in a mysterious fire. They did not rebuild. Though troubling from a social standpoint, it was perhaps this biased system and tragedy-caused reduction in fishing pressure that prevented the finfish and squid from suffering the same population devastation that the otters, whales, and abalone experienced. Again, this example offers stimulating parallels for classroom discussion about modern dilemmas, such as the ethics associated with financially or physically displacing local people in order to protect nature.

Section two of the book takes a new literary approach by focusing on Julia Platt and Ed Ricketts. The change is noticeable but not off-putting. The authors use the stories of their work to compress and illustrate the story of the decline of the Monterey Bay ecosystem. Sprinkled—somewhat jarringly—among the stories of Platt and Ricketts are anecdotes of daily life around Monterey Bay as recounted to Sotka by surviving residents. The authors' aptitude for prose, coupled with the fresh stories, was a real treasure. More of this original research would have increased the book's value for academics and local historians.

The engrossing chapters of section two paint Platt as a gun-toting crusader. Among the first women to earn a Ph.D. in marine zoology in 1898, Platt could not find a university that would hire her as a faculty member, despite the significant scientific contributions she had made as a post-bachelor degree researcher at Harvard. Undaunted, she decided that if she could not study the ocean she loved, then she would protect it. She waged a battle to insure that private businesses did not usurp the public's legal right to beach access, declaring, "I act in the matter because the Council and Police Department of Pacific Grove are men and possibly somewhat timid." She fought against the canneries that were polluting the bay's waters with fish guts and fouling the air so badly that it killed the area's tourist industry. Finally, she decisively won the job of mayor and leveraged the position to create California's first marine protected areas that would later be the seeds that sprouted into the revival of Monterey Bay. Bringing the inspirational story of Julia Platt to a wider audience is a highlight of Palumbi and Sotka's book that is worth sharing. Now, young female marine scientists have a new iconic role model.... make room, Rachel Carson.

At the same time that Platt was crusading, Ed Ricketts was also crusading (and carousing) as a writer and philosopher. Ricketts was a naturalist and saw the complexity and interconnectedness of the marine ecosystem. He warned that the intense sardine fishery of the 1930s was not sustainable. In 1947 he was proven right when the fishery collapsed. He bucked the thinking of the time, arguing that marine resources were not limitless and heavy extraction of one species could be detrimental to others. His novel philosophies grew out of years of intellectual debate and friendship with the yet-to-be famous Joseph Campbell and John Steinbeck. While the story of this friendship is richly and interestingly told, there is no new information about these great men, because Palumbi and Sotka draw heavily on secondary texts.

In addition, this section contains a small historical flaw. The authors write that John Cage was a local composer. In fact, this eventually world-famous experimental composer was not a resident of the area. Rather, he frequently traveled there with his wife to visit her sisters. Palumbi and Sotka treat Cage as a passing character when he clearly had an influential relationship with Ricketts, as is evidenced by other sections of the book they cite (Rodger, Katharine A., editor, 2002. *Renaissance man of Cannery Row: the life and letters of Edward F. Ricketts*. University of Alabama Press, Tuscaloosa, Alabama). Both men's life works were built on the complexity of systems (ecological or performing art) and its parts. In brief, they differed in that Cage thought these parts were not interdependent and believed in the supremacy of organization, while Ricketts believed in the supremacy of content. These debates sharpened each man's philosophies.

The last section of the book covers the trophic cascade, Monterey Bay Aquarium, recent history, and prospects for the future. Palumbi's voice seems strong in this section. Among the greatest living marine ecologists, Palumbi wields his knowledge to tell the tale of the otter, sea urchin, and kelp trophic cascade in a manner that will engage both neophytes and seasoned ecologists. The chapter on the creation of the Aquarium is informative and has scholarly value, but when weighted against the other topics in the book, this meaty chapter focuses too much on the Packards—the funders of the Aquarium—as personalities rather than as drivers of change. Other than a cursory three-page account of the rise and decline of the tuna fishery, the chapter fails to describe the ecological changes occurring in the 1980s to the present. The final chapter “The century to come” is more of a poetic end than a true peering into possible futures. It touches on developing marine management mechanisms and tensions but does not link these to how they could potentially influence the ecology of Monterey Bay. Basically, the last two chapters are an unsatisfying and rushed survey of the last 30 years.

In sum, *The death and life of Monterey Bay: a story of revival* is a solid work that suffers from trying to be too many things to too many people. The authors have attempted to craft a popular science, academic science, natural history, and local history book all rolled into one—with varying success. The authors punt on the attempted history with a caveat in the preface that they are not historians by training. They follow this by stating the purpose of the book is to explore the “natural history as it was shaped by people.” While they do spin an engaging tale of the interactions between humans in the environment, it is not a true natural history, lacking many of the details that mark a natural history book. Likewise, the attempt at a popular science book compromises the effort at an academic science book and vice versa; in the struggle for tone and style, neither wins. The execution of character development, flow, and interwoven story lines is admirable, but falls short of masterful popular science writing. The abrupt transitions hint that large chunks of text were left in the editing room, and the remainder quickly stitched together. The book also does not have the level of detail that would engage subject-matter scholars. Furthermore, the lack of in-text notation for the endnotes is very frustrating, requiring constant flipping to the end of the book to check for endnotes. One of the book's features that will likely satisfy all audiences are the beautiful plates of historical portraits and lithographs and color photographs of wildlife currently found in Monterey Bay.

While I will not rave about this book to my colleagues, I will certainly recommend it to my students. I have encountered no better book for building a case study course on marine socio-ecological systems for advanced undergraduates and entering graduate students. The level of detail is appropriate for their knowledge level and the narrative style makes the information accessible. The book layers the complexity of managing socio-ecological systems over familiar and foundational cases studies. This layering should facilitate students learning at a high level of information analysis, synthesis, and evaluation. This benefit to students alone makes the book a worthwhile addition to the marine management literature and every coastal university library should have a copy.

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A new undergraduate textbook emphasizing human impacts

Stiling, Peter. 2012. **Ecology: global insights and investigations**. McGraw-Hill, New York. xxi + 579 p. \$122.50, ISBN: 978-0-07-353247-9 (alk. paper).

Key words: climate change; ecology textbook; undergraduate.

As most readers of this publication know, the introductory ecology textbook guild is crowded with well-established titles. Thus, when reviewing a new entry, one question that comes to mind is whether further niche partitioning is possible. Certainly, that thought was uppermost as I read Stiling's *Ecology: global insights and investigations*. I will address this question subsequently, after first providing an overview of the contents and organization of the book.

Stiling's text is suitable for a first course in ecology. The writing is clear and appropriate for undergraduates. The figures, as in most current textbooks, are colorful and have the now familiar "art house look." To me they seem rather "busy," far from the Tufte ideal, but for students the graphical elements such as text balloons probably will aid in their understanding.

The organization of topics follows the common bottom-up approach (populations, communities, ecosystems). After the usual introductory chapter there are two chapters on evolution, starting with population genetics. The next chapter on behavioral ecology is a plus in my view since some authors omit this topic altogether or cover it in bits and pieces. The second section consists of three chapters on physiological ecology: temperature, water, nutrients. Here the concept of the niche is first introduced. The next two sections deal with population ecology (three chapters) and species interactions (six chapters). Life tables and growth models are challenging for some students but most of them should find Stiling's explanations easy to follow. Some equations are annotated with text boxes that I think students will find helpful, though, as with the figures, a purist might consider them distracting. Human population growth is also covered. Stilling has separated predation, herbivory, and parasitism into three separate chapters, totaling about 60 pages. That is more than twice as much space devoted to this topic than in several other textbooks that I examined. There is also a separate chapter on mutualism which some authors do little more than define. The final two sections cover biomes (three chapters) and ecosystems (three chapters).

How then does this book compare to, and differ from, other options that an instructor has to choose from? To answer this question, I looked at three other texts aimed at the same audience: Robert Ricklefs's *The economy of nature* (2008, Sixth edition, Freeman and Company, New York), Townsend et al.'s *Essentials of ecology* (Townsend, Colin R., Michael Begon, and John L. Harper, 2008, Third edition, Blackwell, Malden, Massachusetts), and Thomas M. and Leo Smith's *Elements of ecology* (2009, Seventh edition, Pearson, San Francisco, California). While there is a lot of overlap in content, as would be expected, there are differences in organization. One striking similarity among all four books is the use of textual asides to illustrate both the relevance of each topic and how science is done. In Stiling these are presented under headings that correspond to the book's subtitle: "Global insight" and "Feature investigation." Smith and Smith do something similar but call them "Ecological issues" and "Field studies." Ricklefs has "Global change" and "Ecologists in the field" while Townsend et al. have boxes titled "Topical EConcerns." The convergence of these textbooks presumably reflects movement toward some successful pedagogical formula.

Stiling's "Global insight" features were interesting and always related to the topic at hand. For example, in Chapter 18 on species richness, the global insight section describes a study that looked at the effect of increased rainfall on species composition in a California chaparral community. For the chapter on interspecific competition, the global insight describes a study of the invasive rusty crayfish in Wisconsin. When the subject is the physiological ecology of temperature, the global insight focuses on changing phenologies caused by climate change. Similarly, the "Feature investigation" sections will be read with interest by students who are predisposed toward ecological studies. Some of the examples are descriptive but many are experimental and illustrate concepts such as control

and replication. Classics, like Connell's study of barnacle competition, are covered as well as more recent works.

One big difference between Stiling's book and the others is that there is no summation section; the final chapter is on biogeochemical cycles. In contrast, the other textbooks I consulted ended with chapters focusing on human impacts. Stiling does address these issues, but does so throughout the book rather than at the end. I think his approach is successful but will be interested to see if there is convergence in future editions in this detail as well.

There were some errors in the book but most were of the typographic variety, and no more than would be expected for a first edition. However, I was dismayed to see the word "effected" used in place of "affected" in the preface since this is one of my pet peeves as a reader of student papers. Of the more substantive errors I will mention three. First, in Figure 5.2 a pure temperature conformer is referred to as a heterotherm. The author seems to use this term as a synonym for poikilotherm, which it is not.

I frequently correct students who use the word "species" in place of "individual." In the summary section of Chapter 2 there is a similar confusion: "[Darwin's] theory of natural selection supposed that better adapted species would ... leave more offspring." It is, of course, the better adapted individual that leaves more offspring. And then, a few lines later: "[Mendel's] crosses showed how species inherited factors from relatives...."

Finally, the equation for mark-recapture is correct but the explanation is garbled: "We assume that the ratio of marked to unmarked individuals in the second sample *is the same as the ratio of marked individuals in the first sample to estimate the total population size.*" It should end with "... is the same as the ratio of marked to unmarked individuals in the population." As I said, these errors are no worse, or more numerous, than I have seen in other first editions. They certainly would not dissuade me from adopting the text. In fact, I sometimes find it fun to challenge my students to find errors for extra credit. It encourages a close reading, and yet I seldom have to pay off.

I return now to the question posed at the beginning of this review: Is there a place for this textbook in a highly competitive field? I think so. In terms of accuracy, clarity, and accessibility, this work is comparable to its competitors. Given that, another criteria that is important to me is how well the sequence of chapters corresponds to the order of my lecture topics. For example, I like the two chapter coverage that Stiling gives to evolution right at the beginning. In contrast, Ricklefs covers the same material in Chapters 6 and 13 while Smith and Smith wait until Chapter 5. The topic of behavioral ecology, to which Stiling devotes one chapter, is given much less coverage in Townsend et al. and hardly any by Smith and Smith. On the other hand Stiling's book does seem to end rather abruptly since he omits any sort of final overview. For me, however, that is not a major issue, and this book will be a contender for future adoption.

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