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### *Trees, Truffles, and Beasts: How Forests Function* by Chris Maser, Andrew W. Claridge, and James M. Trappe

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## BOOK REVIEW

**Trees, Truffles, and Beasts: How Forests Function.** 2008. Chris Maser, Andrew W. Claridge, and James M. Trappe. Rutgers University Press, Piscataway, NJ. \$26.95, paperback; 280 pages. ISBN-13: 978-0-8135-4226-3.

Forests are an integral part of human life. In addition to producing lumber and economic livelihood, they are a rich source of biological capital and provide ecosystem services, such as clean air and water, upon which we depend. Yet our understanding of the interconnections and coevolution that profoundly affect how forests work remains woefully underdeveloped. This lack of understanding, and moreover our delusions of having control over nature, hampers proper forest management, threatens the continued health and function of forests, and degrades the future of organisms that are an integral part of forest ecosystems—including humankind. This is the underlying premise of *Trees, Truffles, and Beasts*, which explores many unseen forest inhabitants and processes in an approachable style that is easily accessible to foresters, biologists, and lay people alike.

The scope of *Trees, Truffles, and Beasts* is, ambitiously, to examine forests “from microlevel to infinity.” The diverse background of the authors allows them to accomplish this goal relatively successfully. Chris Maser has written a variety of books on forest ecology, natural history, and sustainability, and both Andrew Claridge (New South Wales Parks and Wildlife Division, Australia) and Jim Trappe (Oregon State University, United States) have written extensively about forest ecosystems, fungi, mammals, and the interactions between the three. The result is a book that emphasizes a holistic approach to understanding forests by examining the convergence in processes, function, and human (mis)management of forests on opposite sides of the world: the Pacific Northwest of the United States, and southeastern Australia. As a recent transplant from northern California to southeastern Australia, I found

this book particularly useful in illustrating the similarities between what on the surface appear to be antipodal worlds.

The first half of the book builds the reader’s basic understanding of similarities in forest structure, composition, and function between North America and Australia. We are introduced to “the forest we see” in both locations—the dominant climates, weather patterns, and flora of the forests. The book then focuses on what the authors clearly find most compelling—the unseen web of interconnections and coevolution between trees, fungi, soil microorganisms, and animals that underpin forest function. To familiarize readers with the forest inhabitants, the book jumps back and forth between continents, giving species accounts in brief, natural-history-guide style. Readers will be challenged to find any other book that details how, for example, Douglas-fir (*Pseudotsuga douglasii*) and messmate stringybark (*Eucalyptus obliqua*) compare in their functional roles in forests, or that explores the commonalities between California red-backed voles (*Myodes californicus*) and long-footed potaroos (*Potorous longipes*). However, those who find scientific names useful will be frustrated by their conspicuous absence throughout most of the book; Latin names are tucked away in 2 unreferenced appendices.

The authors devote considerable attention to an introduction to general mycology, and to the role that mushroom-producing fungi play in affecting forest composition and health. They provide many fascinating examples of the trophic roles fungi play in forest environments but focus most of their efforts on mycorrhizal truffles (fungi that produce underground “mushrooms” that are consumed by animals) and the mycophagous animals that disperse their spores. In particular, the authors emphasize how truffles provide critical nutritional rewards such as vitamins, protein, and fatty acids for mycophagous mammals, and how mycophagy provides critical ecosystem services such as improving soil moisture content,

maintaining fungal diversity, redistributing nutrients, dispersing spores, and connecting what might otherwise be isolated fungal populations. Each argument for the importance of fungi and mycophagy in forest ecosystems is well referenced and backed-up with fun examples, often from the authors' own experiences. I was excited to discover, for example, that the small pits dug by truffle-hunting mammals such as brush-tailed bettongs (*Bettongia penicillata*) in Australia or northern flying squirrels (*Glaucomys sabrinus*) in the Pacific Northwest not only loosen soil and help prevent surface runoff, but also act as "minireservoirs" that wet the earth at the exact location where the truffle fungus is closest to the soil. This allows for increased water uptake by both the fungus and its host tree. Topics such as these are a true strength of *Trees, Truffles, and Beasts*, and they provide valuable insight into an aspect of ecology that receives much less attention than it is due.

The second half of the book concentrates on natural and human-caused landscape-scale processes that affect forests, such as forestry, grazing, succession, exotic species, and habitat fragmentation. Here as well, the authors stress the importance of fungi and mycophagy and walk the reader through the roles that truffles and mycophagous mammals play in forest regeneration. Using illuminating (although sometimes meandering) case studies that evoke a strong sense of history and place, the authors tell the complex histories of fire, logging, and grazing in both southeastern Australia and the Pacific Northwest. I found chapter 6 particularly interesting. This chapter details prehistoric frequency of fire on both continents, its role in forests now, and how contradicting evidence has been used by both foresters and conservationists to further their particular agendas. This chapter and chapter 7, which examines forest succession and habitat dynamics, cover both basic ecological concepts and the complex ways in which human manipulation of the environment (such as the introduction of rabbits, foxes, and sheep in Australia, or climate change on both continents) can have unforeseen consequences on biodiversity and forest regeneration. These chapters also take on a more philosophical perspective on land management, and repeatedly return to both the value of intact forests and the responsibility we have as "adults with decision making power" to "consider the long-term consequences of

our short-term decisions." Overall, the authors successfully make the case that, because of the deep complexities that underlie natural processes, we cannot return to the past, but must instead focus on what priorities we want set for the future of our forests.

Although *Trees, Truffles, and Beasts* presents a refreshing perspective on forest ecology and land management, I found its organization to be somewhat cumbersome and overall in need of a professional editor. For example, the book concludes with an emphasis on the importance of mushrooms and mycophagy in forests by again using species accounts to compare and contrast mycophagous mammals in the Pacific Northwest and southeastern Australia. Not only does this feel like an intellectual repetition of the first half of the book, but in fact some species that are profiled in the first chapters are again covered here, with relatively little new information presented. Further, the tone of the book varies greatly with the section's author, and at times takes on a shrill, strident tone that comes across as overwrought. Exacting readers will find numerous small inconsistencies mildly irritating. For example, some technical words are italicized, while others are not; at times units are presented first with the English system and then metric, at times the other way around; and text boxes and figure captions do not always match. Likewise, most readers will find the value of the figures and illustrations uneven, though I greatly enjoyed the color plates of primarily mammals and truffles.

Editorial distractions aside, *Trees, Truffles, and Beasts* is an important push for a changing doctrine that focuses on forests as an integrated whole, rather than as simple stands of individual trees. The book's emphasis on unseen processes, and particularly on the relationships among trees, fungi, and animals, will bring fresh insight and inspiration to readers and may help guide future dialogues on forest conservation and management. I recommend it to anyone interested in forests, fungi, or beasts worldwide.

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