

in river management, we must at all costs make sure that the next generation starts its journey with a truly integrated perspective from the outset.

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doi:10.1017/S0376892909990129

A Critique of Silviculture. Managing for Complexity

BY KLAUS J. PUETTMANN, K. DAVID COATES AND CHRISTIAN MESSIER

xvi + 188 pp., 14 figs, 4 tables, 23 × 15 × 1 cm, ISBN 978 1 59726 146 3 paperback, US\$ 30.00/GB£ 26.50, Washington, DC, USA: Island Press, 2008

According to the authors of this book, the discipline of silviculture appears to be at a crossroads. They undertake a critical analysis of this academic subject area in the light of recent paradigm shifts. The analysis starts off with the historical context of silviculture and then challenges basic silvicultural assumptions and approaches. This is followed by contrasting the principles of ecology with those of silviculture. In conclusion, the authors propose a new conceptual framework for silviculture that involves an improved understanding of ecological complexity and of complex systems.

The book is intended for both academic and practical readerships in the area of forestry, ecology and landscape management. It is a useful text for professionals, as well as students with a basic understanding of silviculture and ecology. It is a topical book which should appeal to anyone with an interest in forest ecosystems and their management. Various definitions inserted in boxes in the main text, as well as a glossary of terms and an index offer easy access to beginners among the readership.

The book material is well researched and organized. All statements of fact are accurate. Particularly laudable is the attempt to research the complex German origins of silviculture, including terms in the German language, which clearly highlights the authors' efforts and their commitment.

Analysing the discipline of silviculture in relation to ecology and complexity science is a very effective and stimulating way of facilitating thinking beyond traditional disciplinary boundaries; it helps to involve new ideas and findings in ecology and complexity science.

However, I tend to disagree with the view that silvicultural systems are larger programmes of activities that define all aspects of management throughout the lifetime of a forest (pages 23 and 42). In my view and that many other authors, silvicultural systems with only one notable exception are rough concepts describing how the main forest canopy must be manipulated to achieve natural regeneration of trees. Once this is achieved, the silvicultural system has come to an end and any further management of the emerging new tree cohorts is subject to a sequence of interventions which have no relation to silvicultural systems. This is why many textbook authors have decided to use the term regeneration systems instead.

There is also a slight misunderstanding with the German term *Femelschlag* on page 32. *Femelschlag* corresponds to the English term

group system and not to an irregular shelterwood system. On page 33, the authors refer to *Badischer Femelschlag* and it is this variant of the *Femelschlag* systems which best reflects the English term 'irregular shelterwood system'.

All arguments are clear and logically presented. The conclusions and proposals of the last chapter are stimulating and give useful indications for future directions in silviculture. However, some of the proposals, for example accepting and modelling uncertainty and the stochastic nature of the forest ecosystem, are well perceived in the scientific community and are being followed up by mixed modelling approaches and other concepts. It is worth noting that some of the practical recommendations for adaptive management are already in use in a number of European countries.

The book layout has been carefully designed. Presenting essential definitions in boxes on every page is a good idea. Figures and tables are clear and support statements made in the text. The references are extensive and up-to-date. The index and particularly the glossary of terms are extremely useful.

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doi:10.1017/S0376892909990130

Paradise Found. Nature in America at the Time of Discovery

BY STEVE NICHOLLS

x + 524 pp., 23.5 × 16 × 3 cm, ISBN 978 0 226 58340 2 hardback, US\$ 30.00, Chicago, USA: University of Chicago Press, 2009

Satan, approaching Paradise in *Paradise Lost*, is bent on conquest. Yet he notices that this land offers much that his domain does not, rows of 'goodliest trees, loaden with fairest fruit', being enjoyed by the original humans in 'simplicity and spotless innocence.' In fact, Satan is so impressed with the beauty of Paradise and its inhabitants that he feels a twinge of regret before 'honor and empire' goad him into 'conquering this new world' (J. Milton, *Paradise Lost*, Book IV, lines 146–394).

While Milton was composing his epic, other Europeans were out conquering other new worlds, often writing lavishly about the natural wonders that they encountered. Steve Nicholls draws on these accounts in *Paradise Found*, an environmental history of North America that covers more than 500 years in as many pages. The chapters present variations on the following theme: once, plants and animals existed in tremendous abundance, being harvested more-or-less sustainably by clever Indians. European explorers visited and wrote breathless superlative-choked letters about how amazing it all was. Then colonists arrived and initiated processes that would ruin Paradise and degrade its inhabitants, every bit as efficiently as Milton's Satan, but not half as conflicted. Much later, dimly comprehending what had been lost, governments implemented conservation measures that, while better than nothing, could only salvage a shadow of nature's former glory. To Nicholls, North American ecosystems are brilliant tapestries that have been left in the sun to bleach and unravel: entire threads have been lost, and those that remain are faded and frayed.

There is something to be said for this reading of history, and for its retelling in a manner that fuses accessibility, scholarliness and advocacy. Conservationists are highly sensitized to biodiversity loss, but Nicholls's focus on the atrophy of populations reminds us that even many extant species have withered to the point of ecological irrelevance. The book pulls together an imposing amount of reference material, and Nicholls gives plenty of airtime to both primary historical sources and recent relevant peer-reviewed science.

The narrative suffers, however, from several ambiguities and inconsistencies, which are conveniently encapsulated in the enigmatic title. Beyond establishing an allegorical link to Milton's poem, the word 'Paradise' reveals more about the author's view of pre-European America than that of the first explorers and settlers. Nicholls spends a lot of time trying to imagine 'how exhilarating it must have been' to be a sixteenth-century naturalist and comparing his own experiences unfavourably to those 'of the first Europeans to stand on these shores.' But those first Europeans, their occasionally exuberant reports notwithstanding, spent a lot of time starving and freezing and generally being miserable; settlements repeatedly vanished without a trace, Virginia was a 'death trap' for English colonists and shipwrecked explorers died of scurvy on desolate islands.

So is the use of 'Paradise' intentionally vague and a tad ironic, helping to illuminate different perspectives on nature? Probably, although I would be more confident in that interpretation if Nicholls's preference for the pre-European version of the continent were not so evident. He struggles for words to describe that world, eventually running out of modifiers and recycling them: the natural abundance of pre-European America was 'immense,' 'incalculable,' 'infinite,' 'incredible,' 'unimaginable,' 'incomprehensibly vast,' 'seemingly endless,' 'incredible' and 'unimaginable' again, and finally 'extraordinary, almost unbelievable.'

No and yes. 'Extraordinary' is odd; the central thesis of the book is that this natural abundance was ordinary, and today's impoverished biota is extraordinary. But 'almost unbelievable' is true enough. As Nicholls notes several times, explorers' accounts were often exaggerated, even fabricated. It is not clear how far we can trust the reports of excitable observers who, in addition to astonishing abundance, reported 12-foot-tall moose, egg-laying porcupines and herds of 300 bears. Although sceptical of these more outlandish claims and deferring to more rigorous quantitative estimates when available, Nicholls nonetheless builds his story around images passed down by the same observers: sturgeon so plentiful that they threatened canoes, porpoises so common that they endangered bathers, sea turtles so numerous that Columbus worried about running aground on them, and counties-full of '100,000, or 1,000,000, or 100,000,000' bison. He seems willing to do this because the architects of the 'Paradise publicity campaign for the New World. . . didn't *always* lie about what was here' (my emphasis), but that is not a ringing endorsement. Nobody can quibble with the qualitative argument: we have many fewer bison, wolves, otters and auks than we used to. But how many fewer is a question that these explorers' accounts cannot adequately answer.

The other perplexing word in the title is 'discovery'. Nobody has to tell Nicholls that white men did not discover America, the book is as much about indigenous Americans as it is about abundant wildlife, and indeed he chronicles the repeated 'discovery' by Europeans of different parts of the continent at different times. Thus, like 'Paradise', Nicholls's 'discovery' might be a thin slice of irony sandwiched between two layers of meaning, but it is hard to tell. In any case, this word choice is symptomatic of a deeper problem. A recurring motif of the book is that we may be 'grossly underestimating

what nature *should* look like' (emphasis in original). Well, what should it look like? Nicholls has a firm opinion on this point, lamenting, for example, the inability to restore the Great Lakes 'to their state when the missionaries and coureurs of France first saw them'.

This baseline is, obviously and unavoidably, arbitrary. But Nicholls seems uncomfortable acknowledging that. Instead, he repeatedly implies that there was something almost cosmically correct about 'the ecological balance that existed when Europeans arrived' and blames the loss of this balance on the pillars of 'Western philosophy': capitalism, Christianity and democracy. In contrast, Nicholls defends 'Indian philosophy' against attempts, 'fashionable in more academic circles', to over-revise the Noble Savage stereotype: 'let's not throw the baby out with the bath water'. Sure, Native Americans had mercantile instincts and were strategic, sometimes brutally so, in their manipulation of nature. 'But the point I want to make,' Nicholls writes in closing, 'is that, even if populations were reduced, they were able to bounce back'.

Tell that to the Pleistocene megafauna, animals that, fortunately for Nicholls's arguments, 'predate the historical framework of this book'. Fine, but their extinctions might still have informed the theoretical framework of this book. I share Nicholls's sadness at never having had the chance to see a flock of passenger pigeons. But those who are equally sad about never having had the chance to see a mammoth have written different books about extinction, ones that emphasize human population size, technology and prey naiveté (not to mention climate change) at least as much as differences between monolithically depicted cultures.

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doi:10.1017/S0376892909990142

Wildlife Law: a Primer

BY ERIC T. FREYFOGLE AND DALE D. GOBLE

xiii + 346 pp., no figs, 23 × 15 × 2cm, ISBN 13: 978 1 55963 976 7
paperback, US\$ 35.00, Washington DC, USA: Island Press, 2009

The title of this book is a little misleading, although no more than that of many other law books, because 'Wildlife Law' implies a general coverage of the discipline. In fact the coverage is entirely related to the law of the USA.

The authors are both law professors at American universities (Illinois and Idaho) and their objective has been to provide an overview of wildlife law in the USA for a wide audience, from lawyers and law students to professionals working in natural resource management and ordinary citizens. The text is well written and, although it inevitably contains a certain amount of legal jargon, should nevertheless be accessible to the intelligent lay person.

The book consists of 13 chapters, beginning with 'The basics,' and subsequently covering areas such as state ownership, capturing and owning wildlife, private lands, inland fisheries, state game laws, federal statutes, Indian tribal rights and two chapters on the Endangered Species Act (ESA). In addition, there is a short, but very useful section, on the USA's court system, statutes and legal citations. The book is well produced with a logical layout, printed in a clear and readable typeface.