



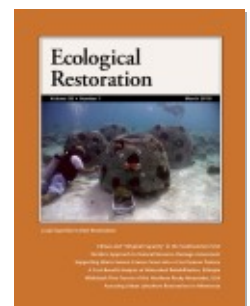
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Rewilding the West: Restoration in a Prairie Landscape
(review)

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Ecological Restoration, Volume 28, Number 1, March 2010, pp. 98-99
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Published by University of Wisconsin Press



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heuristic simulations of very simple systems, the authors show how different research groups may reach conflicting conclusions owing to differences in measurement error or environmental variability. They use hierarchical Bayesian probability analysis to demonstrate the value of pooling results from multiple studies (meta-analysis) to generate a better understanding of system dynamics and a better estimate of uncertainty, and discuss other new information-pooling approaches.

Ecological Restoration in the Light of Ecological History. 2009. Jackson, S.T. (Dept of Botany, University of Wyoming, Laramie, WY 82071, jackson@uwyo.edu) and R.J. Hobbs. *Science* 325(5940):567–569.

Although ecological restoration looks to ecological history to identify appropriate restoration targets, many of these targets will be unreachable or unsustainable owing to the extent and sources of environmental damage and to ongoing climate and environmental change. Moreover, the notion of “natural” is being revised with growing awareness of how native peoples have shaped their environment for millennia. It is important to study the nature and timing of ecosystem responses to disturbance, both historical and paleoecological, and to determine when predisturbance targets are worthwhile. Today restoration emphasizes management for change, and interventions seek to ensure the sustainability of environmental goods and services. Nevertheless, the authors argue for continued restoration of historical ecosystems—perhaps in a mosaic of historical and engineered systems.

Rapid Recovery of Damaged Ecosystems. 2009. Jones, H.P. (School of Forestry and Environmental Studies, Yale University, New Haven CT, holly.jones@yale.edu) and O.J. Schmitz. *PLoS ONE* 4(5):e5653. doi:10.1371/journal.pone.005653.

The authors searched the primary literature for the years 1910 through 2008, finding 240 studies on the recovery of human-scale ecosystems (not study plots) after cessation of perturbations such as logging, agriculture, mining, or overfishing. In contrast to dire predictions that human-inflicted damage will be irreparable on any relevant time scale, these studies provided evidence that most ecosystems can recover from major perturbations in a matter of decades if people limit the perturbation and actively manage the system. About half of the ecosystems and measured variables recovered completely or nearly completely within 50 years. Recovery was most rapid in aquatic systems and slowest in forests. The authors find hope for a transition to sustainable use of ecosystems.

What's Next for Science Communication? Promising Directions and Lingerings Distractions. 2009. Nisbet, M.C. (School of Communication, American University, 4400 Massachusetts Ave NW, Washington, DC 20016,

nisbet@american.edu) and D.A. Scheufele. *American Journal of Botany* 96(10):1767–1778.

The authors debunk some myths about public communication, most notably that ignorance is at the root of social conflict over science. They stress the importance of *dialogue*, rather than simple transmission of facts, and the role of message “frames” (interpretative storylines that communicate what is at stake in a societal debate and why it matters) in engaging the public. Controversies surrounding climate change, evolution, plant biotechnology, and nanotechnology illustrate how most policy debates relevant to science and emerging technologies are decided at the intersection of politics, values, and expert knowledge. It is important for communicators to connect to public values, go beyond elite audiences, and build a participatory public media infrastructure for science and environmental information.

Book Reviews

Rewilding the West: Restoration in a Prairie Landscape

Richard Manning. 2009. Berkeley: University of California Press. Cloth, \$24.95. ISBN: 978-0-520-25658-3. 238 pages.

In his book *Rewilding the West*, Richard Manning uses well-researched history to chronicle the impacts of Euro-American settlers on the Missouri Breaks country and vice versa. In so doing, he illustrates the folly of settlers expecting to wring a wet-climate living from semiarid western landscapes. A particularly unyielding terrain, this piece of Montana's Missouri River Basin enriched a few entrepreneurs from time to time but in the long run disappointed a great many who came there looking to farm, ranch, and trade. These yeoman settlers either did not know or else failed to fully appreciate that the Native Americans living in the Breaks before them had been not only few in number but mainly hunters and gatherers.

Manning begins by describing the grand vision inspired by the vast panoramas and glorious myths of the Breaks in particular and the West in general. Early explorers, artists, novelists, land marketers, political hacks, and even presidents lured land-hungry settlers west with overblown images of prosperity and romance. Most of the Native Americans who managed to survive the guns and diseases brought by the settlers who came first were soon displaced by those who came second. Farming, ranching, and mining quickly replaced hunting and gathering. Successive abuses of native peoples, wildlife, soils, and water followed.

Most of Manning's book tracks the roles of various historical characters in discovery, immigration, and exploitation. He shows how federal and state land-use policies often provided subsidies that masked the land's limited productivity. Time after time, disasters from drought and blizzard demonstrated that the settlers' expectations had far

exceeded the land's long-term carrying capacity. The final chapters hail the exodus of inappropriate mythologies and the emergence of a new lifeway and land-use ethic. Manning is a master of seeking out obscure information about historical characters, both well known and less known.

The book is infused with Manning's distaste for inappropriate "learned legacies" of ranching and farming. This aversion leads to the final chapter, "A Beginning," in which he lays out a different vision, one focused less on exploitation and more on conservation. This particular vision sees fewer permanent human inhabitants, less obsession with profit, and a greater appreciation for large native animals roaming freely. From this focus comes the title of the book.

Manning is a marvelous writer. His talent for seeking out the sensational, the outlandish, and the reprehensible in human behavior carried me through a litany of real historical characters, little known facts about their lives, and the desperate land-use legacies they spawned. As with the best of nonfiction writers, he teaches by telling stories and not by preaching sermons.

The parts of *Rewilding the West* that I found most disconcerting were where Manning superimposed his own judgments and interpretations on the historical and ecological records. Said another way, Manning's judgments of the proper places of people and their lifeways in the Breaks occasionally interrupt his historical narratives that tell the same story better. Misguided interpretations of ecological phenomena form the basis for some of his judgments. Perhaps most prominently, his notion for "restoring" the Breaks to their early historic condition, elaborated in the last two chapters, is informed in part by long-accepted dogmas of succession theory and coevolution.

What are succession and coevolution? Early in the 20th century, the plant ecologist Frederic Clements proposed that a given ecosystem naturally proceeds from bare ground or disturbance through a predictable sequence of successional stages toward a stable, relatively undisturbed climax condition. Moreover, he thought ecosystems consisted largely of coevolved species. Until the last few decades, most ecologists have considered the climax, that is, early historic condition, to be the "gold standard" for ecosystem restoration.

At about the same time that Clements's ideas were shaping land management, H.A. Gleason proposed an "assembly" theory of community development. He theorized that ecosystems were composed of somewhat random and constantly changing assemblies of species. Most scientists of the day climbed on Clements's bandwagon and ignored Gleason. But today, a growing cadre of ecologists, given recent discoveries that nearly all ecosystems are far younger than their constituent species, agree that assembly is the more appropriate paradigm. On this basis, restoring communities based solely or primarily on assumed coevolution of species makes little sense.

Despite clinging to an outdated paradigm, Manning makes a convincing argument that replacing cattle with bison and prairie dogs, and ranching with ecotourism, make sense. Without subsidies, ranching as historically practiced cannot survive economically. Beyond ranching, what are the options? We may have to decide on the basis of personal preference; without a generally accepted "baseline" ecosystem as a target, reaching consensus may be difficult.

Some scientists recently have proposed a restoration venue for North American ecosystems based not on an early historic state but on what existed 15,000 years ago in the late Pleistocene. Humans with their penchant for overexploitation had not yet arrived. Dominant in such ecosystems were the megafauna, now mostly extinct but with extant "surrogates" such as Old World elephants, camels and horses. Pleistocene rewilding goes beyond the imaginings of Manning, and to my knowledge has not developed a large following.

I believe *Rewilding the West* will find audiences among historians, ecologists, land managers, and many lay readers of western prose. Its brevity, readability, and general authenticity contribute to its attractiveness. Those interested in the human history, natural history, and nontraditional possibilities in the American West will want a copy.

Reviewed by Joe Truett. Joe has served as a senior biologist with the Turner Endangered Species Fund since January 1999. He holds degrees in wildlife ecology and range management from the University of Arizona and has served as the project manager for restoration of black-footed ferrets, black-tailed prairie dogs, and other grasslands species and their habitats. He has authored several books and is also an adjunct professor in the Department of Fishery and Wildlife Science, New Mexico State University, Las Cruces, New Mexico; joetruett@gilnet.com.



A Critique of Silviculture: Managing for Complexity

Klaus J. Puettman, K. David Coates and Christian Messier. 2008. Washington DC: Island Press. Cloth, \$60.00. ISBN: 978-1-59726-145-6. Paper, \$30.00. ISBN: 978-1-59726-146-7. 206 pages.

To a restoration ecologist, the title of this book offers the best of both worlds: applying empirically rooted, practical approaches of silviculture to restore or sustain complex systems, rich with redundancy and resilience. I think it's fair to say that the authors' goal was to deliver on the promise of their title. Their path to this end is a long and winding one, sometimes frustrating, and in the end, they don't deliver all the title promises.