

Book Reviews

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Our schizophrenic national forests

Johnson, Christopher, and David Govatski. 2013. **Forests for the people: the story of America's eastern national forests**. Island Press, Washington, D.C. xii + 394 p. \$70.00 (cloth), ISBN: 978-1-61091-009-5 (alk. paper); \$35.00 (paper), ISBN: 978-1-61091-010-1 (alk. paper).

Key words: forest management; national forests; U.S. Forest Service; Weeks Act; Wilderness Act.

The U.S. government owns a lot of the country's land—just shy of 30% of the total. Most ecologists will be familiar with national parks (~210 000 km²) and national forests (~769 000 km²). There are many other (smaller) categories of federal ownership spread across many federal agencies, but the holdings in these two categories alone account for about one-third of all federal land holdings and just under 10% of the land area of the United States. Many ecologists conduct research in national parks and national forests because they include exemplars of “natural” environments. Any ecologist who has navigated the intricate bureaucracies and seemingly endless email and paperwork trails required to obtain permits to do research in national parks or national forests understands clearly the differences between these two types of federal lands. But to many others—professional ecologists, our students, and the broader public—the differences between national parks and national forests, and especially the nuances of political differences among national forests, are not at all clear. In *Forests for the people*, Johnson and Govatski provide a welcome introduction to the origin and continued use of a particular set of national forests—those in the eastern United States—and in doing so illuminate the challenges of managing public lands for future generations.

In the 26 states east of the 100th meridian (i.e., all of the eastern United States, including Puerto Rico, from western Minnesota south to Texas) the U.S. Forest Service administers just over 100 000 km² of forest lands (about 50% of its holdings) in 52 national forests. Unlike the forest reserve lands of the west that were established easily on public lands, the eastern United States had long been settled (by European colonists) and parceled out. Thus, enabling the nascent U.S. Forest Service to create national forests in the east required new legislation to allow the government to buy land from private landowners.

The first third of *Forests for the people* traces the history of the people involved in crafting the relevant legislation—the Weeks Act—that amply, if occasionally dispiritingly, demonstrates John Godfrey Saxe's adage “[l]aws, like sausages, cease to inspire respect in proportion as we know how they are made.” Many of the key people are well-known—Benton MacKaye, Gifford Pinchot, Teddy Roosevelt, Charles Sprague Sargent—but others, such as Willis Moore, George Swain, Filibert Roth, Joseph Walker, and Philip Ayres, were less familiar (to me) but no less important. These, and many others, included ministers, public servants, and college professors throughout New England, the southeast, and the upper Midwest. One of my favorites is Maria Louise Sanford, a feminist, conservationist, and professor of rhetoric at the University of Minnesota. She regularly wrote editorials for

Courant, the journal of the Minnesota Federation of Women's Clubs, in which she lobbied for the creation of permanent forest reserves in the state. Despite opposition from Minnesota's congressional delegation, she and her colleagues worked incessantly to convince the Interior Department to do something to stop the rampant cutting of Minnesota's forests. Her lobbying paid off—in 1902, after nearly three years of work, the U.S. Congress for the first time passed a bill to create a national forest (previously they had created only “forest reserves”), and in doing so created the nucleus of what today is the Chippewa National Forest.

It took nearly another decade and another president, however, before Congress finally passed the Weeks Act. In early 1907, Illinois Representative and Speaker of the House Joe Cannon (who described himself as “one of the great army of mediocrity which constitutes the majority”) assigned Massachusetts Representative John Weeks to the Agriculture Committee. Weeks supported legislation to create national forests in the east, and Cannon, recognizing its inevitability, directed Weeks to craft a bill that “as a business man, [you] are willing to support.” More than four years and two congressional sessions later, Congress finally passed, and President Taft signed, the Weeks Act.

Most of the lands purchased by the Forest Service within the first decade after the Weeks Act was passed could hardly be called forests. The vast majority of the eastern forests had been clear-cut for timber and pulp, and what was left was barely more than seemingly endless burned-over fields of stumps. In fact, because the most immediate consequences of the widespread deforestation of the late 19th and early 20th centuries was a dramatic increase in flooding, the Weeks Act itself restricted the Forest Service to acquire only those lands that contained the headwaters of navigable rivers; in many cases, especially in New Hampshire's White Mountains, it took many years to certify land as appropriate for purchase under the Weeks Act. Because the land had been so heavily lumbered, the earliest management activities in the new eastern national forests were tree planting, forest restoration, and erosion control.

The success of these early efforts (and in many cases simply letting nature take its course) is readily apparent today in the blanket of forests in the eastern United States. What those of us who today enjoy hiking, fishing, hunting, and other recreational pursuits in the national forests often forget, however, is that national forests are not national parks. Rather, the Weeks Act, like other legislation applicable to government-owned lands, allows for the granting of rights to cut timber, extract minerals, and in general, to manage the resources of the national forests (the 1897 Forest Management Act, otherwise known as the Organic Act, specified that national forests should be established *only* to protect water flow and to provide a continuous supply of timber for the use of U.S. citizens). In this vein, it is also worth recalling that the U.S. Forest Service is an agency of the U.S. Department of Agriculture, not the U.S. Department of the Interior, which administers national parks. Gifford Pinchot, who was chief of the USDA's Division (later Bureau) of Forestry from 1898–1905, convinced President Theodore Roosevelt, and then the Congress, to transfer the U.S. forest reserves from the jurisdiction of the Interior Department to the Agriculture Department. Following the passage of the aptly

named Transfer Act in 1905, the Forestry Bureau was renamed the U.S. Forest Service, and Pinchot became its first chief.

Pinchot was a utilitarian who envisioned that the national forests would be managed for multiple uses, including logging, grazing, and mining. In the remaining two-thirds of *Forests for the people*, Johnson and Govatski present eight case studies of how Pinchot's vision of multiple use, and the long reach of the Weeks Act, continue to determine management of our national forests. These forests now are: beloved wilderness areas (in, e.g., West Virginia's Monongahela National Forest and the Boundary Waters Canoe Area Wilderness in Minnesota's Superior National Forest); refuges for endangered species (e.g., Florida's Apalachicola National Forest; Michigan's Ottawa and Hiawatha National Forests); and sites of hydraulic fracturing for shale oil and gas (e.g., Pennsylvania's Allegheny National Forest). The case studies clearly present how these multiple uses are juggled, how the public—especially visitors to national forests—perceive and respond to them, and what lessons can be learned from more than a century of politically driven forest management. Students in environmental studies courses as well as citizens interested in changing environmental policy would find these case studies illuminating and educational.

Forests for the people is really two books. The history of the Weeks Act is a scholarly, enjoyable, and at times entertaining read that also reminds us how little has changed in public policy making in the last 150 years. The case studies of current uses of the national forests are somewhat tougher slogging, and some of the details (e.g., the seemingly endless detail on the technology of hydraulic fracturing) could have been shortened or eliminated. Like our schizophrenic relationship with national forests—are they parks and preserves or are they natural resources to be exploited—the two parts of *Forests for the people* do not mesh especially well. But that is no reason not to treasure our national forests, or not to read this book. As in the national forests, there is something for anyone to learn about in *Forests for the people*.

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The status of ecological research in plant secondary metabolites

Iason, Glenn R., Marcel Dicke, and Susan E. Hartley, editors. 2012. **The ecology of plant secondary metabolites: from genes to global processes**. Ecological Reviews. Cambridge University Press, New York. xiv + 335 p. \$120.00 (cloth), ISBN: 978-0-521-19326-9; \$60.00 (paper), ISBN: 978-0-521-15712-4.

Key words: extended phenotype; plant secondary metabolites; research directions; scaling up.

This volume contains papers presented at a British Ecological Society Symposium in 2010 at the University of Sussex on *The integrative roles of plant secondary metabolites in natural systems*. It is a tribute to Gottfried S. Fraenkel (1901–1984), whose seminal paper “The raison d’être of secondary plant substances” (*Science* 29:1466–1470) transformed our understanding of plant secondary metabolites (PSMs) by regarding them as adaptations rather than as waste products. PSMs, he suggested, have evolved by natural selection for defense against pests and pathogens, for signaling and communication, and in response to stress. The editors of the present volume argue that now is a fitting time to consider the subtlety and scale of the effects of PSMs, “which cross trophic levels, spread throughout ecosystems, and even affect global processes.”

The 16 chapters are laid out loosely by level of ecological organization, from individual variation in PSMs to their effects on communities and ecosystems. Much of the text is historical review, although every chapter concludes with a section headed “Conclusions and future directions.” Among the handful of papers that look beyond the role of PSMs in interactions between pairs of species, one stands out. In Chapter 6, “Volatile isoprenoids and abiotic stress,” Bagnoli et al. consider the generation of volatile isoprenoids (VIPs) in the plant cell, their multiple evolutionary origins, and the effects of VIP production on global processes. The narrative flows expertly from

consideration of the chloroplast physiologies that produce VIPs to a discussion of their distribution and diversity throughout the Plantae; brief comments are also included about the role of VIPs in radiative forcing at the ecosystem and global levels. This stimulating discussion adopts the perspective that should have informed the entire volume.

Several more chapters make legitimate connections between cellular processes and larger system effects. In Chapter 14, “From genes to ecosystems: emerging concepts bridging ecological and evolutionary dynamics,” Bailey et al. adopt Richard Dawkins’s perspective of the extended phenotype—without, however, citing Dawkins. They discuss how genotypic differences in cottonwoods through their interactions with herbivores and soils differentially affect community evolution and ecosystem processes. This storyline has been evolving since Thomas Whitham first described cottonwoods in Weber Canyon, Utah, but since the discussion remains largely centered around cottonwood communities, one is left wondering if these effects are generalizable to other species, communities, or ecosystems. A second chapter (Chapter 13) by Iason et al., “Plant secondary metabolite polymorphisms and the extended chemical phenotype,” also embraces Dawkins’s concept. In dealing with the interspecific effects of monoterpenes in two plant systems, it employs the notion of “extended phenotype” to describe the effects of monoterpenes on one or two trophic levels removed from the host plant. Chapters 13 and 14 are compelling and would be great fodder for a graduate seminar to explore topics such as diffuse coevolution and group selection.

Most of the remaining chapters present a mix of literature review and brief synthesis. Van Dam’s “Phytochemicals as mediators of aboveground-belowground interactions in plants” is typical in presenting a timely review of the roles of PSMs in intra-plant communication. While all of the papers provide summary information on a variety of plant metabolites and occasionally offer up original studies of interactions between plants and other species, most fail to make the connections