

# AMERICAN INDIAN FIRE USE: POLICY IMPLICATIONS OF THE DEBATE



Hutch Brown

About a century ago, the Forest Service began one of its first major policy debates: whether fire should be used to manage forests, a practice known as “light burning” (Carle 2002). By 1920, the debate was all but decided when William B. Greeley, who would soon become Forest Service Chief, blasted “the fallacy of light burning” as “Paiute forestry” (Greeley 1920).

## Shifting Debate

The term “Paiute forestry” was particularly telling. In the early 20th century, the debate was not about *whether* American Indians used fire to manage landscapes, but *that* they did so much of it—which, in the view of early conservationists, violated the precepts of sound, scientific forestry. Had Indians not been stopped from burning, one forester declared, then Virginia’s rich forests would have been entirely reduced to grasslands (Maxwell 1910), anathema to a generation weaned on the cut-and-run logging that had devastated so many forested landscapes throughout the East.

Early foresters won the debate, but their success over time was mixed (Langston 1995; Pyne 1982). Particularly troublesome was the policy of fire exclusion, which helped alter ecosystems historically dependent on fire in ways that were neither anticipated nor desired. In the West, several concomitant factors also played a role:

- Heavy livestock grazing eliminated the grasses that carried frequent understory fires,
- High-grading altered forest structure and composition,
- Pulses of wet weather stimulated forest growth in normally arid or semiarid regions, and
- Climate change contributed to fuel volatility (Westerling and others 2006).

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Collectively, these influences variously affected landscapes. In areas historically dominated by parklike stands of large long-needle pines, dense carpets of small trees sprang up. In a drought, the overcrowded stands became susceptible to huge fires that were out of character for the original fire-adapted woodlands. Many of these lands are now at high to moderate risk of fires that could compromise human safety and ecosystem integrity (Arno and Allison-Bunnell 2002; Arno and Fiedler 2005; Covington 2002; Schmidt and others 2002).

By the late 20th century, the growing fire severity was setting off alarms. In search of alternative approaches, people began taking a fresh look at how Indians interact-

ed with the land (see, for example, Day 1953; Pyne 1982, 2001; Russell 1983, 1997). Today, few people accuse Indians of mismanagement; instead, the question is whether Indians managed much at all.

Underlying the dispute are alternative policy implications for managing Federal land. Ironically, the degree to which Indians actively shaped the landscapes where they lived has been used to support the case for both preservation and development.

## The Case for Preservation

In its simplest form, preservationism conforms to the Romantic view of American Indians typified by Henry Wadsworth Longfellow’s *The Song of Hiawatha* (1855) (for a brief discussion of the Romantic view of nature, see Brown 1999).

In the Romantic view, Indians lived in a “state of nature,” in harmony with their environment, doing little to alter landscapes beyond the slash-and-burn agriculture practiced by some tribes around their small riparian villages. Influenced by the Romantic view, Federal land managers have traditionally pursued a policy of maintaining national parks, wilderness areas, and many older forests in a “natural condition” unaffected by human activities (Delcourt and Delcourt 2004).

Preservationists draw on the view of Indians living in harmony with nature to argue against active

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management altogether. “Tens of millions of North America’s indigenous people lived in peace with wildland fire for thousands of years,” declares one Forest Service critic (Stahl 2004), implying that Indians did not actively manage landscapes. In the Midwest, preservationists seized upon a poorly researched paper about presettlement Indian activities (McCorvie 1994) to oppose active management on national forest land (Day 2005). In response, the Forest Service’s ecologist for the Eastern Region drafted a detailed rebuttal (Nowacki 2002).

Some of the fiercest debate has centered on the idea of wilderness as “untrammelled by man,” a notion challenged by J. Baird Callicott, who points out that Indians shaped many of the wilderness landscapes they lived in, particularly through fire use (Callicott 1995; Callicott and Nelson 1998).

Holmes Rolston defends the wilderness idea by denying that Indians modified the rugged, higher elevation landscapes in most of today’s wilderness areas (Callicott and Nelson 1998). Noss (1995) attempts to resolve the debate by broadening the notion of wilderness, drawing a distinction between the way wilderness landscapes evolved—in some places under the influence of Indian fire use—and the kinds of postsettlement human impacts that inevitably destroy wilderness.

## The Case for Development

Some reject such distinctions as arbitrary, challenging the very notion that postsettlement activities in any way degraded, damaged, or destroyed ecosystems. Citing Callicott (1995), Diamond (1987), and Lackey (2001), Davis

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and Slobodkin (2004) question the whole concept of ecosystem health, suggesting that it signifies value-based social preferences rather than a scientifically determinable condition of the land. They support ecosystem restoration, but as a social choice rather than as an effort to return to presettlement conditions.

Fitzsimmons (1999) goes a step further, arguing that ecosystems are constructs that do not exist at all. He sets up a straw man that he can easily knock down, arguing that ecosystems are living beings in static equilibrium and that it takes a leap of faith to believe in them. By contrast, forests are dynamic and subject to constant change, so there is nothing systemic in nature that needs protection—or restoration—from degradation or damage. All that matters are the values and uses associated with natural resources, which change over time according to shifting human needs.

If development best serves those needs, then nothing should stand in its way.

The American Indian experience can be seen to support the case for development in that Indians altered landscapes, tailoring them to their needs (Fitzsimmons 1999). In a sense, Indians were the first land developers. Delcourt and Delcourt (2004) attribute the Pleistocene megafaunal extinctions, which profoundly altered vegetative structures (Pyne 2001), in part to overhunting by people using Clovis spearheads.

Tribal peoples simply met their own particular resource needs, heedless of the ecological impacts, just as European settlers later met theirs, though less extensively and intrusively. In the view of some, this is precisely what people should be doing today in managing Federal lands: They should be shaping

## Did American Indians Cause Ecological Degradation?

Long before European settlement, agriculture by American Indians gave rise to relatively large populations with flourishing cultures in the valleys of the central Mississippi River and its tributaries. According to Delcourt and Delcourt (2004), tribal peoples supplemented their diets with nuts, actively managing forests to promote masts. Their cultural activities converted natural late-successional forests into

“an early-successional, anthropogenically managed mosaic of [oak–hickory–walnut] forests and [agricultural] old-fields.” However, their populations finally reached unsustainable levels “as native forest ecosystems became fragmented beyond the connectivity threshold,” resulting in “evacuation of the Mississippian heartland a little more than 500 years ago” (Delcourt and Delcourt 2004).

and developing public lands in accordance with their own values and needs, best expressed through modern market mechanisms (Fitzsimmons 1999).

## Moot Points

Whereas preservationists insist that Indians—unlike people today—lived in harmony with nature, Fitzsimmons (1999) takes the opposite view, maintaining that tribal people had to struggle with nature for a living and therefore altered landscapes wherever they went, just as people do today.

The reality is more complex. Human impacts on landscapes in presettlement times were on a continuum of “concentric circles radiating outward” (Delcourt and Delcourt 2004; Johnson and Earle 2000), ranging from high in areas used for living, farming, and gathering (see sidebar on page 34); to moderate in travel corridors and outlying areas used for hunting; to minimal in remote areas where people seldom went. For example:

- Tribes routinely burned small portions of the Pacific Northwest to stimulate huckleberry growth (French 1999; Mack 2003). However, such huckleberry “yards” and the “corridors” needed to reach the yards (Lewis 1988) were surrounded by vast expanses of ancient rainforest that showed little or no human influence.
- Indians frequently set fires to maintain open forests around Seeley Lake, MT (Arno and Fieldler 2005; Brown 2005), but such corridors in the Northern Rockies often led through tangles of boreal forest that rarely burned (Barrett 2004; Barrett and others 2005). American explorers Lewis and Clark (Ambrose 1996; DeVoto



*Pine savanna on Wade Plantation in Thomas County, GA. The fire-maintained ecosystem, typical of presettlement landscapes across millions of acres on the southern coastal plain, supports wiregrass and widely spaced longleaf and slash pines. Photo: David J. Moorhead, University of Georgia (courtesy of Forest Images <<http://www.forestimages.org>>).*

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Many—but not all—presettlement landscapes were frequently disturbed, and many disturbance-adapted ecosystems can be restored.

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- 1981) and Canadian explorer David Thompson (Jenish 2003), while crossing the Northern Rockies to the Pacific Ocean, found parts of them so wild and inhospitable that they almost starved.
- At the time of European settlement, the vegetation in much of the Eastern United States—particularly in the more southerly ecological divisions characterized by Bailey (1980) as hot continental and subtropical—was on a fire-governed continuum ranging from tallgrass prairie (with very frequent fire); to oak and pine savannas (with frequent fire); to closed oak–pine, oak–hickory, and oak–chestnut forests (with occa-

sional fire) (Bonnicksen 2000; Delcourt and Delcourt 2004; Stewart 2002; Whitney 1994). In much of the East, dry lightning is rare, yet fire was relatively frequent, suggesting human origins. In Virginia, for example, Indians used fire to open and maintain large grassy areas for bison and elk, including the entire Shenandoah Valley and parts of the Piedmont to the east (Brown 2000; Stewart 2002). Still, such openings were set in a forested matrix that included mesophytic forest types that would have seldom burned, particularly in wetlands and mountain coves, on floodplains, and in topographically protected areas.

In part, the debate has been fueled by differences in academic focus (Delcourt and Delcourt 2004): Archeologists and economists study human activities with high environmental impacts, whereas ecologists and paleoecologists focus more on natural processes in remote areas. Delcourt and Delcourt (2004) outline a new interdisciplinary

approach to explain “human ecosystems as self-organized, complex adaptive systems” within the larger “adaptive cycles of organization, disruption, and reorganization of ecosystems” in Holocene North America.

For many, however, the debate remains a pointless argument by proxy: Each side plays on public biases about Indians to promote its own vision for the future of Federal lands. The real point is that many—but not all—presettlement landscapes were frequently disturbed. Whether the cause was human or natural is immaterial for land management purposes (Arno and Fiedler 2005). Whatever the cause, researchers can often piece together enough evidence of a disturbance history to allow land managers to restore a reasonable semblance of presettlement compositions, structures, and functions for disturbance-adapted ecosystems (Engstrom and others 1999).

## The Case for Restoration

The prospect of ecological restoration begs a question: Is the past at all relevant for land management today? Or should land managers be guided by modern values and needs alone?

The international community has come to accept the need for balancing the social, economic, and ecological components of sustainable land management (Forest Service 2004). Although striking the right balance is difficult, it does require accounting for ecological considerations—the compositions, structures, and functions that characterize communities of plants and animals. These complex sets of ecological interactions have come to be known as ecosystems (Tansley 1935).

Ecosystems are indeed constructs, but that makes them no less real. Forests are also constructs, as are communities and market economies; their delineation and workings are subject to considerable debate,\* yet no one would argue that these things do not exist.

Ecosystems constitute interdependencies that the organisms in them need to survive—whether as individuals, species, or lifeforms—and they are not static, but subject to ongoing adaptive transformations (Delcourt and Delcourt 2004; O’Neill 2001). As the species in ecosystems evolve in response to new stimuli in their environments, ecosystems correspondingly evolve.

\* Gifford Pinchot, in addressing the Saturday Club in Boston, MA, on November 30, 1895, tried in vain to describe what a forest is, only to conclude that “I have been unable to find or prepare an entirely satisfactory definition.”

However, if change comes too fast, as often happens through land use conversion, ecosystems can be degraded, damaged, or destroyed. For example, a trout stream—a particular kind of aquatic ecosystem—will collapse if too much of the watershed is converted to impervious surfaces; most of the organisms in it will die and most of the species will disappear. The stream will become a biologically impoverished conduit for stormwater runoff.

The past is therefore relevant for land managers in two ways:

1. *As opportunity.* By emulating the disturbance regimes that governed historical species assemblages and regulated



*Ponderosa pine forest with encroaching grand fir understory on the Malheur National Forest in northeastern Oregon. Even where overgrown and degraded, ponderosa pine forests offer reference conditions for restoration resembling the original ecosystem. Old trees, logs, and stumps provide evidence of historical stand composition and structure; fire scars reflect historical fire return intervals. Photo: Dave Powell, Forest Service (courtesy of Forest Images <<http://www.forestimages.org>>).*

historical communities, a semblance of the original ecosystem can often be restored, even taking climate change into account (see the sidebar). Where restoration is possible, people can choose to embrace or reject it based on their values and needs. For example, they might choose to restore a ponderosa pine ecosystem to satisfy heritage values, to abide by a land ethic, or to meet concomitant needs for improved waterflows, enhanced biodiversity, and reduced fire danger. The process for making such collaborative decisions on national forest land is the land and resource management planning called for under the National Forest Management Act of 1976.

2. *As guide.* If the choice is made for restoration, then land managers need guidance on how to achieve it. In particular, they need a reference ecosystem—“a model used to plan an ecological restoration project and later to serve in the evaluation of that project” (Day and others 2005). The model is based on evidence from the past of the composition, structure, and functions that characterized the ecosystem to be restored. For example, in restoring ponderosa pine, land managers might base the treatment prescription partly on residual evidence on the ground—old logs, stumps, and depressions indicating the number and distribution of trees in the original forest (ERI 2005).

A national survey in 1999–2000 suggested strong public support for restoring ecosystems on national forest land to something resembling their presettlement conditions (Shields and others 2002). People attach values such as “naturalness” and wildland heritage to the national forests and grasslands that they do not to the towns where they live or to the farms that grow their food. In a neighborhood greenway corridor, for example, residents might accept a largely lifeless conduit for stormwater runoff; but on national forest land, they generally prefer a trout stream.

## Federal Policy

Since the 1990s, Federal land managers have articulated a strong policy focus on ecological restoration, particularly for fire-adapted ecosystems:

- The interagency wildland fire policy of 1995, updated in 2001, emphasizes “the need for restoration and rehabilitation of fire-damaged lands and ecosystems,” partly by restoring “the role of fire in ensuring ecosystem sustainability” (IFWFPRWG 2001).
- The National Fire Plan of 2000 makes ecological restoration one of five goals; its purpose is to “restore damaged landscapes” through “thinning and the restoration of fire” (NFP 2000).
- The 10-year plan for implementing the 2001 interagency strategy for reducing fire risk, updated in 2005, promotes “restoration of fire-adapted ecosystems” (10-Year Plan 2002).

For years, the Forest Service has pursued various forms of ecological restoration, from restoring degraded salmon and trout streams, to restoring remnants of tallgrass prairie, to restoring overgrown

Where ecosystem restoration is possible, people either embrace or reject it based on their values and needs.

## Climate Change and Ecological Restoration

Climate sculpts ecosystems (Millar 2004). Climate change can reach a point where it alters patterns of vegetation across a landscape. Research in the Sierra Nevada, for example, suggests that forest encroachment on high-elevation meadows is due to a warming climate (Millar and others 2004), dooming any efforts to restore such meadows. In an age of climate change, land managers are preparing to adapt the ecosystems they manage to changing climatic conditions.

However, even under a changing climate, not all landscapes are

certain to assume entirely new characteristics. Outside of Alaska, signs of ecological transition in the United States are (so far) relatively rare. Forest treatments such as thinning and underburning restore an ecosystem’s resistance to drought, insects, disease, and fire; they also restore its resilience following a wildfire or other major disturbance. Climate change exacerbates such stresses and disturbances; land managers can therefore use restoration, where appropriate, as a way to mitigate the worst effects of climate change.

long-needle pine ecosystems and degraded oak savannas and woodlands. In fact, the Forest Service's main focus, according to former Chief Dale Bosworth (2004, 2005), has shifted from resource extraction in the decades following World War II to ecological restoration and outdoor recreation today. Nevertheless, the Forest Service had no well-defined restoration policy—or even a common definition until recently. In 2005, the Forest Service's Executive Leadership Team commissioned a group to propose a framework for ecological restoration on national forest land (Day and others 2005). The agency is in the process of implementing its new Restoration Framework.

## Transcending the Debate

As the debate about “Paiute forestry” indicates, Americans have long used ancestral practices by American Indians to promote particular land management policies. In recent years, some have used the Romantic view of the noble savage to campaign against active management; whereas others, having discovered “that Native Americans were not the fine ecological stewards we imagine” (Kristof 2005), suggest that focusing on resource extraction is only natural. In effect, Indians are pressed into service to support competing visions for the future of Federal lands: preservation versus development.

Ecological restoration transcends the debate. What matters is not whether Indians altered presettlement landscapes, but that presettlement disturbance regimes—whatever their cause—shaped many ecosystems for thousands of years. Researchers can often reconstruct what happened, providing a choice: Based on site-specific information,

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people can choose to restore a semblance of presettlement ecosystems on Federal land. For more information on the integration of ecological restoration into Forest Service policy, contact Greg Kujawa, Forest Service, Yates Building, 201 14th Street, SW, Washington, DC 20024, 202-205-1762 (tel.), gkuzawa@fs.fed.us (e-mail).

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## References

- Ambrose, S.F. 1996. *Undaunted courage: Meriwether Lewis, Thomas Jefferson, and the opening of the American West*. New York: Simon and Schuster.
- Arno, S.F.; Allison-Bunnell, S. 2002. *Flames in our forest: Disaster or renewal?* Washington, DC: Island Press.
- Arno, S.F.; Fiedler, C.E. 2005. *Mimicking nature's fire: Restoring fire-prone forests in the West*. Washington, DC: Island Press.
- Bailey, R.G., comp. 1980. *Description of the ecoregions of the United States*. Misc. pub. 1391. Washington, DC: Forest Service.
- Barrett, S.W. 2004. Fire regimes in the Northern Rockies. *Fire Management Today*. 64(2): 32–38.
- Barrett, S.W.; Swetnam, T.W.; Baker, W.L. 2005. Indian fire use: Deflating the legend. *Fire Management Today*. 65(3): 31–34.
- Bonnicksen, T.M. 2000. *America's ancient forests: From the Ice Age to the Age of Discovery*. New York, NY: John Wiley and Sons.

- Bosworth, D.N. 2004. *The Forest Service: A story of change*. Presentation at conference: Intermountain Centennial Forum; 18 November 2004; Boise, ID. [Web site <<http://www.fs.fed.us/news/2004/speeches.shtml>>.]
- Bosworth, D.N. 2005. *Building capacity for community-based stewardship*. Presentation at meeting: Retirees' Reunion; 8 September 2005; Portland, OR. [Web site <<http://www.fs.fed.us/news/2005/speeches.shtml>>.]
- Brown, H. 1999. Smokey and the myth of nature. *Fire Management Notes*. 59(3): 6–11.
- Brown, H. 2000. Wildland burning by American Indians in Virginia. *Fire Management Today*. 60(3): 29–39.
- Brown, H. 2005. Ecological restoration in Montana's western larch. *Fire Management Today*. 65(4): 28–37.
- Callicott, J.B. 1995. A critique of and an alternative to the wilderness idea. *Wild Earth*. 4(4): 54–59.
- Callicott, J.B. 1995. A review of some problems with the concept of ecosystem health. *Ecosystem Health*. 1: 101–112.
- Callicott, J.B.; Nelson, M., eds. 1998. *The great new wilderness debate*. Athens, GA: University of Georgia Press: 337–93.
- Carle, D. 2002. *Burning questions: America's fight with nature's fire*. Westport, CT: Praeger.
- Covington, W.W. 2002. The evolutionary and historical context. In: Friederici, P., ed. *Ecological restoration of southwestern ponderosa pine forests*. Washington, DC: Island Press: 26–47.
- Davis, M.A.; Slobodkin, L.B. 2004. The science and values of restoration ecology. *Restoration Ecology*. 12(1): 1–3.
- Day, G.M. 1953. The Indian as an ecological factor in the northeastern forest. *Ecology*. 34(2): 329–346.
- Day, K. 2005. Personal communication. Forest supervisor, Hoosier National Forest, Bedford, IN.
- Day, K.; Berg, J.; Brown, H.; Crow, T.; Morrison, J.; Nowacki, G.; Puckett, D.; Sallee, R.; Schenck, T.; Wood, B. 2005. *Ecosystem restoration: A framework for restoring and maintaining the national forests and grasslands*. Unpublished report of the Restoration Framework Team. On file at the Hoosier National Forest, Bedford, IN.
- Delcourt, P.A.; Delcourt, H.R. 2004. Prehistoric Native Americans and ecological change: Human ecosystems in eastern

- North America since the Pleistocene. Cambridge, UK: Cambridge University Press.
- DeVoto, B., ed. 1981. *The journals of Lewis and Clark*. Boston, MA: Houghton Mifflin.
- Diamond, J. 1987. Reflections on goals and on the relationship between theory and practice. In: Jordan, W.R., III; Gilpin, M.E., eds. *Restoration ecology: A synthetic approach to ecological restoration*. Cambridge, UK: Cambridge University Press: 329–336.
- Engstrom, R.T.; Gilbert, S.; Hunter, M.L., Jr.; Merriwether, D.; Nowacki, G.J.; Spencer, P. 1999. Practical applications of disturbance ecology to natural resource management. In: Szaro, R.C.; Johnson, N.C.; Sexton, W.T.; Malk, A.J., eds. *Ecological stewardship: A common reference for ecosystem management*. Volume II. Oxford, UK: Elsevier Science, Ltd.: 313–330.
- ERI (Ecological Restoration Institute). 2005. Forest Service practitioner's workshop. Cibola National Forest, Mt. Taylor Ranger District. 24–25 May.
- Fitzsimmons, A. 1999. *Defending illusions: Federal protection of ecosystems*. Lanham, MD: Rowman and Little Publishers.
- Forest Service. 2004. National report on sustainable forests—2003. FS-766. Washington, DC: Forest Service.
- French, D. 1999. Aboriginal control of huckleberry yield in the Northwest. In: Boyd, R., ed. 1999. *Indians, fire and the land in the Pacific Northwest*. Corvallis, OR: Oregon State University Press: 31–35.
- Greeley, W.B. 1920. "Paiute forestry" or the fallacy of light burning. *The Timberman*. March.
- IFWPPRWG (Interagency Federal Wildland Fire Policy Review Working Group). 2001. Review and update of the 1995 Federal Wildland Fire Management Policy. Boise, ID: National Interagency Fire Center.
- Jenish, D. 2003. *Epic wanderer: David Thompson and the mapping of the Canadian West*. University of Nebraska Press, Lincoln, NE.
- Johnson, A.W.; Earle, T. 2000. *The evolution of human societies: From foraging group to agrarian state*. Stanford, CA: Stanford University Press.
- Kristof, N.D. 2005. Where deer and lions play. *The New York Times*. 13 December.
- Lackey, R.T. 2001. Values, policy, and ecosystem health. *Bioscience*. 51: 437–443.
- Langston, N. 1995. *Forest dreams, forest nightmares: The paradox of old growth in the Inland West*. Seattle, WA: University of Washington Press.
- Lewis, H.T.; Ferguson, T.A. 1988. Yards, corridors, and mosaics: How to burn a boreal forest. *Human Ecology*. 16(1): 57–77.
- Mack, C.A. 2003. A burning issue: American Indian fire use on the Mt. Rainier Forest Reserve. *Fire Management Today*. 63(2): 20–24.
- Maxwell, H. 1910. The use and abuse of forests by the Virginia Indians. *William and Mary College Quarterly Historical Magazine*. 19(2): 73–104.
- McCorvie, M.R. 1994. The use of fire by Native Americans in the eastern woodlands: An ethnohistorical-archaeological perspective. Presentation at meeting: National Park Service Environmental Roundtable; 1–3 November; Lake Geneva, WI.
- Americans have a choice: Based on site-specific information, they can choose to restore a semblance of presettlement ecosystems on Federal land.
- Millar, C.I. 2004. Climate change as an ecosystem architect: Implications to rare plant management, conservation, and restoration. In: Kalt, J., ed. *Proceedings, ecology and management of rare plants*. California Native Plant Society Conference; 11–13 February 2002; Arcata, CA.
- Millar, C.I.; Westfall, R.D.; Delany, D.L.; King, J.C.; Graumlich, L.J. 2004. Response of subalpine conifers in the Sierra Nevada, California, USA, to 20th-century warming and decadal climate variability. *Arctic, Antarctic and Alpine Research*. 36: 181–200.
- NFP (National Fire Plan). 2000. Managing the impacts of wildfires on communities and the environment: A report to the President in response to the wildfires of 2000. 8 September 2000. [Web site <<http://www.fireplan.gov/reports/8-20-en.pdf>>.]
- Noss, R.F. 1995. Wilderness—now more than ever: A response to Callicott. *Wild Earth*. 4(4): 60–63.
- Nowacki, G. 2002. A review of "The use of fire by Native Americans in the eastern woodlands: An ethnohistorical-archaeological perspective" (McCorvie 1994). Unpublished report on file at the Forest Service, Eastern Regional Office, Milwaukee, WI.
- O'Neill, R.V. 2001. Is it time to bury the ecosystem concept? (With full military honors, of course!) *Ecology*. 82(12): 3275–3284.
- Pyne, S.J. 1982. *Fire in America: A cultural history of wildland and rural fire*. Princeton, NJ: Princeton University Press.
- Pyne, S.J. 2001. *Fire: A brief history*. Seattle, WA: University of Washington Press.
- Russell, E.W.B. 1983. Indian-set fires in the forests of the Northeastern United States. *Ecology*. 64: 78–88.
- Russell, E.W.B. 1997. *People and the land through time: Linking ecology and history*. New Haven, CT: Yale University Press.
- Schmidt, K.M.; Menakis, J.P.; Hardy, C.C.; Hann, W.J.; Bunnell, D.L. 2002. Development of coarse-scale spatial data for wildland fire and fuel management. Gen. Tech. Rep. RMRS-87; Missoula, MT: Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory.
- Shields, D.J.; Martin, I.M.; Martin, W.E.; Haeefe, M.A. 2002. Survey results of the American public's values, objectives, beliefs, and attitudes regarding forests and grasslands. Gen. Tech. Rep. RMRS-GTR-95. Fort Collins, CO: Forest Service, Rocky Mountain Research Station.
- Stahl, A. 2004. Our Hundred Years War. *Wildland Firefighter*. 8(1): 7, 9.
- Stewart, O.C. 2002. *Forgotten fires: Native Americans and the transient wilderness*. Norman, OK: University of Oklahoma Press.
- Tansley, A.G. 1935. The use and abuse of vegetational concepts and terms. *Ecology*. 16: 284–307.
- 10-Year Plan. 2002. A collaborative approach for reducing wildland fire risks to communities and the environment: 10-year comprehensive strategy implementation plan. May. Washington, DC: Council on Environmental Quality.
- Westerling, A.L.; Hidalgo, H.G.; Cayan, D.R.; Swetnam, T.W. 2006. Warming and earlier spring increases western U.S. forest wildfire activity. *Scienceexpress* (6 July 2006). <<http://www.sciencexpress.org>>
- Whitney, G.G. 1994. *From coastal wilderness to fruited plain: A history of environmental change in temperate North America from 1500 to the present*. Cambridge, UK: Cambridge University Press. ■