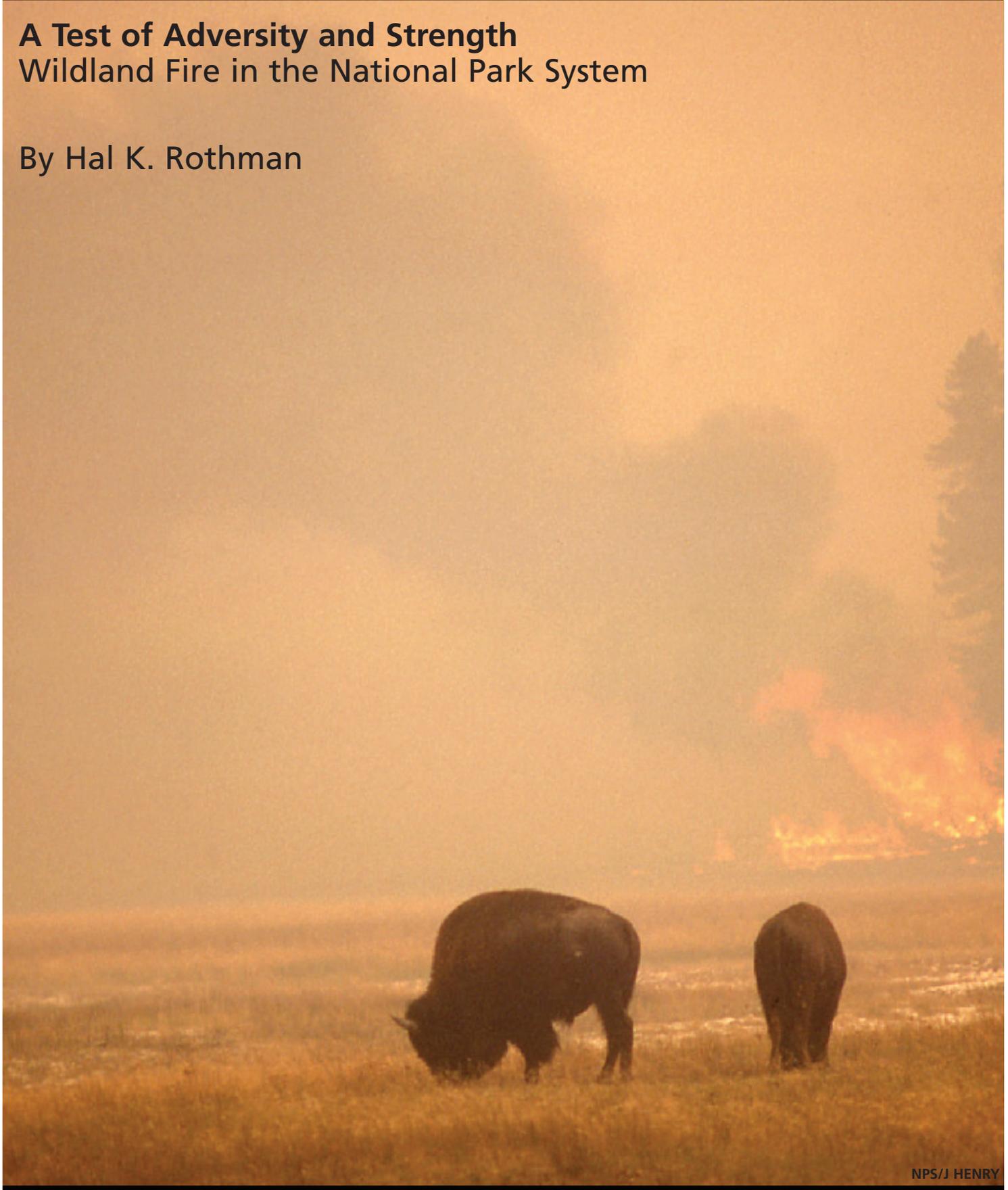




A Test of Adversity and Strength Wildland Fire in the National Park System

By Hal K. Rothman



A Test of Adversity and Strength: Wildland Fire in the National Park System

By Hal K. Rothman,
Principal Investigator

National Park Service
Cooperative Agreement Order #CA 8034-2-9003

Special Consultant:
Stephen J. Pyne

Research Associates:
Lincoln Bramwell, Brenna Lissoway, and Lesley Argo

Project Managers
David Sproul, Michael Childers, and Daniel Holder

Fire is the test of gold; adversity, of strong men.
Seneca, Epistles

Executive Summary

The National Park Service's mission, unique among federal agencies, has made its history of fire policy diverge from that of its peers. Federal fire protection began in the national parks in 1886, when the U.S. Army assumed administration of Yellowstone National Park. After the trauma of the 1910 fire season and creation of a civilian National Park Service in 1916, the new Service embraced the U.S. Forest Service's policy of aggressive fire suppression. For almost fifty years, suppression was policy, a reality that only began to change in the 1950s. The Leopold Report, published in 1963, further articulated differences in the National Park Service's mission with its call for parks to be managed as "vignettes of primitive America." Following passage of the Wilderness Act in 1964, federal agencies – including the NPS – were compelled to reassess their management plans in the context of the new law. Steadily, each federal agency found its mission redefined and its goals recast; this translated into a more diverse spectrum of fire practices, at once splintering the former unity of purpose that surrounded suppression while demanding new ideas and devices to reintegrate those fragmented parts. By 1967, the National Park Service found itself at the vanguard of federal fire programs as it experimented with fire ecology, explored fire management strategies, and devised administrative models better suited to fire's reintroduction than its removal.

This new emphasis on the use of fire as management tool reigned for the rest of the twentieth century. The National Park Service moved to the forefront of federal land management agencies, for the difference in its mission gave it a latitude to experiment with fire that other agencies did not enjoy. As they extended the reach of their management to more and more public land in the United States, government officials found that their success depended on an ability to cooperate with peer agencies in new ways. The cooperative model of Alaska came to the rest of the nation in the 1990s. A series of devastating fires on public and private acreage threw this new set of strategies into doubt, but in the 1990s, the National Park Service remained in the forefront of fire management. Its ideas and practices led; other agencies, including the Forest Service, followed even as national parks experienced fewer fires and other federal lands bore the brunt.

Fire remained an important tool in maintaining the national parks. The boundaries on its use continued to be in flux in the middle of the first decade of the twenty-first century. The question for the NPS became how to integrate its fire management goals with the controversy that surrounded both prescribed burns and those naturally occurring fires that were allowed to burn and with the new management structure that evolved during a succession of difficult fire years.

Table of Contents

Executive Summaryiii

Introduction.....1

Part I: Fight, Control, Exclude: The Era of Suppression 1872-1967

1. 1872-1916: The Military Era.....6

2. The Development of a Fire Management Structure32

3. A Decade of Transformation: The New Deal and Fire Policy54

4. Ecology and the Limits of Suppression.....82

Part II: Put Fire Back In . . . But When, Where, and How?

5. Allowing Fire in the National Park System.....120

6. Institutionalizing a Structure for Fire Management154

7. Yellowstone and the Politics of Disaster.....186

8. The Hazard of New Fortunes: Outlet, Cerro Grande, and the
Twenty-First Century220

Bibliography236

Photographs follow Part I, pp. 110-117

Introduction:

The National Parks and Fire

National parks and fire have an intimate and unbreakable relationship. But since the 1872 establishment of Yellowstone National Park – the world’s first national park – the desire to suppress, control, and manage fire has been an integral part of the management of federal park areas. Managers, first the U.S. Army and, after 1916, the National Park Service, have tried to put fire out, to use it as a tool while trying to prevent harm to property and people, and ultimately to strike some balance between the presence of fire and its enforced absence. These goals and ideals shifted over time, as culture and science suggested better alternatives.

The history of fire management in the national park system divides into two clear and distinct phases. From the 1872 establishment of Yellowstone National Park until 1967, the dominant effort was to suppress wildfires. The idea of complete fire suppression began in the national parks with the appearance of the U.S. Army in 1886, and the model was carried to other federal land management agencies over time. In most cases, this model was easier to express than to achieve. Under Army administration, sincere efforts to put out fires consumed considerable military energy and resources. After the founding of the National Park Service in 1916, suppression in the Parks depended on congressional willingness to provide money to combat the blazes. The pittance that arrived pushed the infant Park Service to emulate U.S. Forest Service. Forged in the flames of the brutal summer of 1910, the Forest Service treated fire as an enemy. It controlled the vast majority of funding for federal fire response and its approach dominated.

This situation lasted from the 1920s until the 1960s. For the National Park Service, two high points of resource accessibility punctuated this long era of suppression – the New Deal of the 1930s and Mission 66, implemented between 1956 and 1966. In these two eras, the NPS received unusual largesse and adroitly linked its objective to remove fire from its landscapes to capital development programs, which simultaneously served other purposes as well. At about the same time, a series of changes in management philosophy contributed to a revolution in the NPS’s approach to fire that became Service policy in 1968. For the second time, the national parks led. As Yellowstone forged a model for national park operations, so the National Park Service became the first federal land management agency to recognize the myriad ways fire could help maintain the landscapes so dear to the American public. Because of changes in scientific thinking that translated into new directions in management policy, the national parks became the testing ground for intentionally ignited fire, as well as for experiments in letting natural fires burn. Ecologically sound, this strategy was revolutionary, threatening, and even dangerous, yet the NPS persisted in the face of challenges to its authority, and in some case, intense questioning of its judgment.

It took twenty years for the philosophical commitment to fire use to evolve into a formal planning structure that encouraged its introduction. Fire planning covered everything from the response to natural and accidental fire to the rules by which fire could be introduced to national park landscapes and the conditions under which this

process could take place. The innovations came slowly, codified in 1978 in NPS-18, and then applied in fire plans throughout most of the national park system during the early and mid-1980s. As the decade drew to a close, the NPS had a structure and process for managing fire, albeit one that had yet to be seriously tested.

In the summer of 1988, that test came: the National Park Service faced a major fire at Yellowstone National Park. Though earlier experiments in fire use had gone awry, the consequences had been local. Major fires at the nation's most iconic national park drew a wider set of critics than previous outbreaks, turning fire management into a national political question. The result was a challenge to NPS fire policy and objectives that threatened not only the way the National Park Service addressed fire, but also the very values at the center of NPS management. In response, the NPS reshaped its new fire policy, often guided by the Department of the Interior and pressure from Congress. That effort culminated in a national fire management plan in 1995. As the 1990s ended, the NPS had redefined its policies and instituted greater safeguards. It faced a century-old problem: much of the land in its care and even more of the acreage surrounding national parks had been subjected to suppression for a very long time. Very little of those forests had been treated to limit the primary consequences of suppression: a buildup of heavy fuel load. In a climate in which both urban and rural wildfire became a regular feature, the NPS wisely anticipated destructive fires on its lands.

That expectation was realized in 2000, when the Outlet fire on the North Rim of the Grand Canyon and the Cerro Grande fire at Bandelier National Monument provided severe examples of prescribed fires –fires set intentionally for management purposes – that escaped control and caused considerable damage. In both cases, evacuations of communities followed. At Los Alamos, New Mexico, near Bandelier, the presence of the Los Alamos National Laboratory, home to important components of the nation's nuclear and weapons research program, exacerbated the danger and fear that stemmed from any major fire. These fires seemed like errors in judgment, and they led to questions about the efficacy of introduced fire, as well as to concerns about the National Park Service's management strategy.

As the twenty-first century dawned, the National Park Service found itself with a complex mission in regard to fire. Suppression as the sole strategy was gone; the intentional use of fire had been developed, challenged, and then improved by the experiences of a generation of application. Fire had a firm role in the national parks but the evolution of management in response to demographic change, politics, and statute remained uncertain.

As long as there are national parks, fire will remain an issue. It is one constant in varied landscapes. The history of wildfire management in national parks has paralleled the evolution of national park management. The increase in categories and types of fire that accompanied the shift to a policy of fire management rather than suppression reflected both the increasing professionalization of the National Park Service and political pressures. After 1968, NPS policy reflected a philosophy that natural fire had to be nurtured where it continued to thrive and fire reinstated where it had been suppressed – except near human habitation or essential infrastructure, where suppression would continue. This was a matter of practical ecology. It also became a highly symbolic expression of change of mission, that national parks should be managed not as primarily recreational or scenic entities but as coherent natural ecosystems, and that Americans'

relationship to the wild had to change from control to celebration of its natural processes. New fire terms reflected freshly minted fire policies that in turn articulated new values. This seemingly arcane debate expressed a deeper turmoil over how American society should exist on the continent. Fire had an internal logic, American culture had another, and the two often collided spectacularly in precisely those places such as Yellowstone, Yosemite, and Everglades that had become cultural icons under the aegis of the National Park Service.

**Part I: Fight, Control, Exclude:
The Era of Suppression 1872-1967**

Chapter 1:

1872-1916: The Military Era

The creation of Yellowstone National Park in 1872 was a monumental moment in American history. With the preservation of the great expanse of the Yellowstone region as industrial expansion created vast and growing economic inequity throughout the nation, the United States seemed to agree on a number of premises. Important among them, the United States formally became “nature’s nation,” a political entity that defined itself as apart from its European antecedents as a result of its spectacular nature and its desire to protect such features from exploitation and development. Such a perspective was new and novel for Americans; the first 250 years of Euro-American settlement has been what the scholar Vernon L. Parrington called the “great barbecue,” an extended era in which Americans wasted more than they consumed.¹

Since the eighteenth century, a powerful counter tradition had existed alongside the overarching exploitive ethos. The residents of the New World had seen the spectacular in the natural, had pointed to the features of the American land as a primary piece of what made the New World special. This was Thomas Jefferson’s counter in his famous correspondence with famed eighteenth century naturalist and industrialist George Louis LeClerc Comte d’Buffon to the charge of North American inferiority; the sentiment was echoed at every subsequent comparison throughout the first half of the nineteenth century. Yellowstone codified that message and took it even further. The reservation of two million acres reflected a sense of loss of the natural in American society that demanded organized and systematic preservation. At the same time, Yellowstone foretold the increasing importance of an organized business community, for the park could not have been created at that time without the help of the railroad companies that by the 1870s spanned the West. Their economic and social contribution to the idea of national parks was great.²

In all the huzzahing and hurraing that surrounded national park proclamation, no one gave much thought to the management of the new park and its many and varied successors. Nathaniel Pitt “National Park” Langford, a transplanted Montanan, was on the Northern Pacific Railroad payroll when he visited Yellowstone as part of the Washburn-Doane Expedition in 1870. He later dramatically articulated a fundamental premise of American culture when he later lectured with his stereopticon images of Tower Fall, the Yellowstone River, and the geyser Old Faithful. In Langford’s construction, national parks affirmed the ideals of democracy; unlike in Europe, where

¹ Vernon L. Parrington, *Main Currents in American Thought: the Beginnings of Critical Realism in America, 1860-1920*, reprint (Norman: University of Oklahoma Press, 1987), 23-26; Barbara Novak, *Nature and Culture: American Landscape and Painting, 1825-1875* (New York: Oxford University Press, 1980), 1-37.

² Alfred Runte, *National Parks: The American Experience* 2d ed. (Lincoln: University of Nebraska Press, 1987), 33-45; David Shi, *The Simple Life: Plain Living and High Thinking in American Culture* (New York: Oxford University Press, 1985), 1-25; Hal K. Rothman, *Devil’s Bargains: Tourism in the Twentieth Century American West* (Lawrence: University Press of Kansas, 1998), 1-26.

kings and barons owned such lands, in the United States, spectacular nature truly belonged to the people. Despite the enthusiasm this vivid cultural symbolism attached to park establishment, the question of actual management of park acreage was not addressed. Although Yellowstone National Park was assigned to the Department of the Interior, no federal agency received specific authority to manage this vast area; no organization or entity jumped to the rescue to protect the park, manage its many resources, and prepare it for visitors.³

This oversight – or even the lack of a wider sense of obligation it indicated – meant that at its founding, Yellowstone embodied a dilemma that continued to haunt the national parks for the next four decades. Culturally powerful symbols, national parks and other federally reserved park areas, after 1906, national monuments in particular, were orphans in the federal system. No agency or individual was charged to manage them or to even check on their condition. Although the intrepid Langford was appointed to the unpaid position of superintendent of the new park, without resources or any genuine way to secure them, he did little improve facilities or create any kind of ongoing management. As U.S. bank examiner for the territories and Pacific Coast states, Langford was occupied elsewhere during his tenure at the park. He made only three short visits to the park during his superintendency.⁴

The pattern established did not bode well. After 1872, the well-known and influential Langford failed repeatedly to secure appropriations, and he could not defend the park against hunters, intruders, or natural elements. His successor, political appointee Philetus W. Norris, who arrived in 1877, fared little better. In 1878, Congress finally provided a \$10,000 appropriation to “protect, preserve and improve” the park. Norris received a \$1,500 annual stipend soon after, suggesting the rudiments of a system, but the futility of the existing system of protection was driven home that same year, when a group of Nez Perce attacked tourists in the park, killing one. Nor did the presence of a superintendent significantly reduce vandalism, an ongoing problem in the park. By 1880, it was clear that a more comprehensive system of protection and management was necessary.⁵

The proclamation of Yellowstone National Park included a fallacious assumption about the lands reserved. The park was purported to be “worthless land,” in the phrase of historian Alfred Runte, Jr., presumably empty of people and as a result, devoid of users. In truth, the Nez Perce who came through as they fled the U.S. Army in 1877 were indicative of a wider pattern of Native American use by many groups over any extended period. At the moment of its establishment, Yellowstone’s main corridors were crowded

³ H. Duane Hampton, *How the Cavalry Saved Our National Parks* (Bloomington: Indiana University Press, 1971), 32-33; Runte, *National Parks*, 35-54; Paul Schullery, *Searching for Yellowstone: Ecology and Wonder for in the Last Wilderness* (New York: Houghton Mifflin, 1997); Paul Schullery and Lee Whittlesey, “Yellowstone’s Creation Myth: Can We Live With Our Own Legends?” *Montana: The Magazine of Western History* 53 1 (Spring 2003), 2-13.

⁴ Aubrey L. Haines, *The Yellowstone Story: Volume Two* (Yellowstone, WY: Yellowstone Library and Museum Association, 1977), 31, 448-49; Hampton, *How the Cavalry Saved Our National Parks*, 33-35; Runte, *National Parks*, 41-46.

⁵ Philetus W. Norris to Secretary of the Interior, June 18, 1878, RG 79.2.1, Correspondence from Yellowstone, 1877- (microfilm), National Archives and Records Administration, College Park, MD; Hampton, *How the Cavalry Saved Our National Parks*, 45-49; Hiram Chittenden, *The Yellowstone National Park* (Cincinnati: The R. Clark Co., 1905), 123-25; Richard A. Bartlett, *Yellowstone: A Wilderness Besieged* (Tucson: University of Arizona Press, 1985), 13-21.

with hunters, trappers, campers, herdsman, and countless others who used park resources in some manner.⁶ Persuading such people that park designation demanded a change in their behavior became one of the most difficult jobs of early superintendents.

The catalyst for the transformation of management at Yellowstone came in the guise of private industry. Railroads had been instrumental in creating Yellowstone National Park, sponsoring Langford's speaking, cajoling noted scientist and renowned late nineteenth century public figure Ferdinand Vandiver Hayden to support the idea of a park, and in some accounts, providing the language for the Yellowstone park bill. Only when a branch line approached the park did concern emerge about the interaction between national parks and private business. In 1883, the Northern Pacific Railroad arrived in Livingston, Montana, fifty-six miles from the park. Six months later, a spur line reached Yellowstone, the first time a railroad had been built to a specifically tourist destination in the American West. Companies sought to capitalize on the new access, a prospect that some among the powerful and influential found discouraging and unworthy of the nation that established national parks as democratic institutions. Even before the spur line was built, no less a luminary than Lieutenant General Phillip H. "Phil" Sheridan, who became commanding general of the U.S. Army on November 1, 1883, observed that the national park had been "rented out to private parties."⁷ At the height of the Gilded Age, the notion of "national" remained strong enough to inspire some influential people to object to the norms of the Gilded Age.

By the time the railroad arrived, Yellowstone National Park had the beginnings of a management staff. Norris arrived in 1877 and a staff person was added in 1880. By the early 1880s, a struggle for control of the park had been consummated. Secretary of the Interior Henry Teller of Colorado, long a proponent of western development and later a strong opponent of conservation, tried to circumvent the principle of a national park as Congress established it by leasing prime park land to the Yellowstone Park Improvement Company, to which he retained close ties. Congress intervened too late to stop the company's primacy, but passage of an appropriation for ten assistant superintendents, a clear effort to put federal personnel in the park to mitigate the company's de facto control, reflected the legislative body's concern. A secondary consequence, recognition of the need for a management staff and a coterie of workers to implement decisions, also resulted.⁸

The real change in park fortunes came in 1886, when Secretary of the Interior Lucius Q. C. Lamar, a Mississippian and former Confederate who had assiduously worked for national reunion, contacted the Secretary of War. A southerner in a post usually reserved for westerners, Lamar was unusual among secretaries of the interior. Far-sighted he had a greater appreciation for the idea of national parks than most of his peers. A cut in funding for Yellowstone National Park had already hamstrung the already limited protection the Department of the Interior could offer and the secretary looked

⁶ Philetus W. Norris to Secretary of the Interior, February 11, 1878; Philetus W. Norris to Secretary of the Interior, June 18, 1878; NARA RG 79.2.1, Correspondence from Yellowstone, 1877- (microfilm), National Archives, College Park, MD.

⁷ Mark Daniel Barringer, *Selling Yellowstone: Capitalism and the Construction of Nature* (Lawrence: University Press of Kansas, 2002), 21-30; Runte, *National Parks*, 44-45; Bartlett, *A Wilderness Besieged*, 43-72; Hampton, *How the Cavalry Saved Our National Parks*, 53-55; Rothman, *Devil's Bargains*, 45.

⁸ Henry Teller to President of the U.S. Senate, December 11, 1882, RG 79.2.1, Correspondence from Yellowstone, 1877- (microfilm), National Archives, College Park, MD.

elsewhere for the personnel he could not provide. In need of a pretext, Lamar found the Act of March 3, 1883, which authorized the War Department to provide troops for national park protection upon the request of the Secretary of the Interior. Lamar asked his counterpart for help, beginning a nearly thirty-year relationship in which the military provided the primary protection for the growing number of national parks and related areas in the United States.⁹

On August 20, 1886, Captain Moses Harris and his fifty-man cavalry troop arrived at Yellowstone, made camp at Mammoth Hot Springs and took command of the park. It was a pivotal moment in national park history, illuminated by the large number of fires burning out of control inside its boundaries. Just days before the military arrived, fires raged, well beyond any kind of control. The cavalry quickly found itself in the business of fire suppression. Some local residents had formed a small firefighting group but they lacked the capability to combat anything more than small blazes. Others resented the intrusion of both the military and the preceding civilian administration.

Harris quickly determined that intentionally set fires, what he called “incendiarism,” caused the most dangerous situations. He regarded such intentional fires as an attempt to undermine the accomplishments of his civilian predecessor, park superintendent D.W. Wear. Harris immediately ordered out his detachment, which put out sixty fires during the remainder of the summer.¹⁰ For the first time, a combination of circumstances committed the federal government to suppressing fires on public lands in a systematic manner. Federal dollars paid troops to stop fire, a novel prospect that both set the tone for the next three generations and became the model for fire fighting. Although the impact on actual fires was usually small, the precedent proved strong. The arrival of soldiers to administer Yellowstone and the commitment of resources to fight fire were simultaneous. Fire suppression was among the earliest management goals of the nation’s sole national park.

From the beginning, a schism existed between fires that were close at hand and typically started by humans, and those that were far away from the main-traveled areas and stemmed from lightning. The military typically knew little of such blazes and so did little about it when such fires came to their attention. The only fires the Army could see were the kind that greeted it in 1886: the malicious, provocative burning that federal officials regarded as the result of a lack of administration of Yellowstone. In the end, the Army did better with fire nearby, both by putting it out and by preventing fires through education and effort.

The military fought the fires it saw. Most of these were set by people, either carelessly or with what military officials regarded as malicious intent. Sometimes arson covered acts of poaching or reflected disagreement about the use of park resources. Intentional fire could be easily construed as an act of defiance against new rules. Civilian and military park administrators classed these as fires that resulted from bad behavior, which made it a small step to the supposition that their perpetrators were malicious. Most such fires were common across the West and on the edges of Euro-American expansion.

⁹ Hampton, *How the Cavalry Saved Our National Parks*, 79-80; Harvey Meyerson, *Nature’s Army: When Soldiers Fought for Yosemite* (Lawrence: University Press of Kansas, 2000), 80-81.

¹⁰ Report of the Superintendent to the Yellowstone National Park, 1886 (Washington, D.C.: Government Printing Office, 1917), 6-7; D.W. Wear to Secretary of the Interior, August 17, 1886, NARA, RG 79.2.1, Correspondence from Yellowstone 1877-(microfilm).

They sometimes had positive ecological impact, but under the military model, the existence of fire betrayed a moral failure that counteracted one of the Army's greatest strengths, its ability to compel behavior.¹¹ The tension between the military as enforcers of a national code and residents as representatives of an individualist past increased.

Before the military arrived, park superintendents decided that tourists and their campfires were the most frequent sources of man-made fire. Without organized areas for camping and accustomed to spending nights outside wherever they chose, local and regional travelers did not yet regard Yellowstone as sacred space but rather behaved within its boundaries as they did anywhere else. Little in the federal code compelled them to act in any other way, for although Yellowstone had been formally established, no set of administrative regulations to govern it had yet been devised. This difference in perception required intervention from administrators. Once assistant superintendents were appointed, they functioned in the capacities later associated with rangers. Chief among their obligations was to assiduously monitor campfires. Careful with their own fires, they insisted that tourists who camped in Yellowstone show equal vigilance. Their efforts yielded positive results. In 1879, when July, August, and September had remained precariously dry after a stormy June, fires remained at a minimum. Superintendent Philetus W. Norris attributed this success to the persistent watchful nature of his charges and to their ability to impress the importance of close monitoring of fire on park visitors. As a result, Norris believed, "less damage was done within the park than around it, or than has heretofore occurred."¹²

A principle that attached itself to fire suppression ever after had been established: the practice succeeded most completely when an education program accompanied it, when park personnel patrolled heavily used areas with regularity, and as long as resources existed to devote to suppression. Luck in the form of regular rainfall and early winters helped, but even at the most rudimentary level, insisting on prevention went a long way toward assuring protection even before Captain Moses Harris's troops arrived at the park. Despite the damage done by the "wonton [sic] carelessness of and neglect of visitors," a sentiment expressed in the 1882 annual report by Superintendent P. J. Conger, by the early 1880s, park superintendents legitimately could claim effective fire management.¹³

When Captain Harris and his men arrived in 1886, fire already had become a primary management obligation at Yellowstone. Although Langford reported few encounters with fire, perhaps a result of his lack of staff and frequent absence from the park, Norris listed fire among the most significant issues he addressed. The lack of resources accorded the park in his era made widespread fire suppression impossible, and without resources, strategy became simply edict against the use of fire within park boundaries. By order of the Secretary of the Interior, visitors and local residents alike were forbidden to use fire inside the park, but Norris and successive superintendents had few ways to enforce this rule. Although the assistant superintendents spent considerable time and effort managing fire and persuading visitors to exercise caution, the lack of

¹¹ Stephen J. Pyne to author, personal communication, December 5, 2002.

¹² Report of the Superintendent to the Yellowstone National Park, 1879 (Washington, D.C.: Government Printing Office, 1917), 22.

¹³ Report of the Superintendent to the Yellowstone National Park, 1882 (Washington, D.C.: Government Printing Office, 1917), 9.

resources assured that annual reports of activities at Yellowstone pointed to fire as a primary problem.¹⁴

The military presence enhanced Yellowstone's ability to address fire issues. At the peak of the pre-military era, ten assistant superintendents functioned as park staff. Harris's soldiers offered five times that number. A reduction in funding of assistant superintendents in the mid-1880s increased the importance of the military. At its most basic level, the arrival of the military provided a police force that reminded anyone in the park that they were not permitted to use fire.

Yet Harris encountered a difficult situation typical of the problems at the early park when he arrived. A number of fires were burning, the most severe of which originated just days before Harris' appearance, about seven miles from the Mammoth Hot Springs Hotel. The soldiers and the resources available were simply not sufficient to extinguish a fire of this size and it spread. In October, the fire still burned, having grown to as much as sixty square miles. A lesser fire had started along Tower Creek in early September and a few others appeared and either burned out or had been extinguished by Harris's troops.¹⁵ In the first months at Yellowstone, soldiers spent a good portion of their time fighting fires. One of the first responsibilities the Army undertook in the national parks was to serve as a fire crew for the park; even more significant, an application of military resources was not a guarantee of effective fire management.

Harris understood the origins of man-made fire in the park. The location of fires provided an important component of his deduction process. Most of the blazes originated near the road between Gardiner and Cooke City, Montana, a heavily traveled road along which many stopped to camp. Harris believed that those who lived near the park, what the officer called "a class of old frontiersmen, hunters and trappers and squaw-men," were responsible for the remainder of park fires. Game had diminished outside park boundaries and these people chafed at federal regulations that outlawed hunting inside park boundaries. Harris surmised that they used fire in two ways. A well-positioned fire drove game to locations where hunters could legally shoot animals and simultaneously provided proof of the disdain such people often felt for any kind of government regulation.¹⁶

It also articulated another problem: national parks prevented nearby residents from customary use of park resources as part of their diet and livelihood. The park had been open land, used communally by people in the region without restriction. Many "old frontiersmen" used nature in ways that echoed Native Americans. Fire was an important part of the regime, and while carelessness sometimes led to wildfires, the tool of fire was such an essential component of their subsistence regime that it was often worth the risk. Such activities were later given the label "light burning," in essence, using fire to clear land for human purposes. Such practices directly conflicted with the Army's objectives.¹⁷

¹⁴ Report of the Superintendent to the Yellowstone National Park, 1879, 22.

¹⁵ Report of the Superintendent to the Yellowstone National Park, 1886 (Washington, D.C.: Government Printing Office, 1917), 6-7.

¹⁶ Report of the Superintendent to the Yellowstone National Park, 1886, 6-7.

¹⁷ Stephen J. Pyne, *Fire in America: A Cultural History of Wildland and Rural Fire* (Princeton: Princeton University Press, 1982), 100-10; Stephen J. Pyne, *Year of the Fires: The Story of the Great Fires of 1910* (New York: Viking, 2001), 112-13.

At Yellowstone, the military did not confront light burning in any systematically organized fashion; instead it simply faced down a ragamuffin band of old frontiersmen who used fire to promote hunting. Yet, the distinction was clear between types of practices. Reflecting the increasingly organized and corporate regime of late nineteenth century America and the professionalization and standardization of the officer corps, the military attempted total suppression. Area residents responded by continuing their existing practices, using fire to transform landscape and make their lives easier, even when deliberately set fires sometimes spun out of control and led to larger blazes. Such practices conflicted directly with the basis of military management, which at its core, boiled down to control of natural forces in the same way that in wartime it sought to master opposing armies. The difference in perspectives set the stage for a generation-long controversy in and beyond national parks that played out between local residents and first the Army and later, federal agencies such as the United States Forest Service (USFS) and the National Park Service.

The creation of the de facto barriers that accompanied national park establishment enhanced existing tension. Establishing the boundaries of Yellowstone raised local eyebrows, for it cut into the base of subsistence upon which the scattered local community depended. Until the military arrived in 1886, residents proceeded with most practices, including the almost random small fires that were a feature of each summer. Civilian administrators could do little about local customs, and by all accounts, practices that existed before the park continued after its existence. When a troop of soldiers provided a different level of protection, it increased tension between the new administrators and local population. Intentional fires became a tactic that spoke volumes about the response of people who felt dispossessed by change. They had no investment in Yellowstone in any way, for the form they used to express their displeasure had such potential to damage the park that their actions precluded reasonable discussion.

Despite the actions of the old frontiersmen, visitors constituted the single most frequent source of fire at Yellowstone National Park. Harris regarded carelessness as the cause of their fires, not detecting the malice he was certain existed in the actions of residents. Campers settled anywhere they chose for an evening or longer, governed by the availability of water, timber for fires and shelter, and even in some cases, game. They acted as if they were traversing the wilderness, not visiting nascent sacred space. Tourists randomly cut timber, left the detritus of their campsites and even the carcasses of recently shot animals. They did not adequately extinguish their campfires, nor were they consistently careful about the ways in which they used fire for cooking, staying warm, or anything else. The prevalence of fire in so many places close to the main arteries of travel provided further evidence of the origins of fire in Yellowstone. Where there were people, Harris observed, there was fire. The cause and effect seemed clear and the Army responded in a fashion characteristic of its management practices. By 1889, the military had developed an important response: it segregated travelers into designated campgrounds to better manage visitors and the fires they sometimes caused.¹⁸

The patterns Harris saw continued throughout the late 1880s. Lightning fires burned far from the inhabited parts of the park. Soldiers stationed in the park fought fires whenever they found them, and most often they found them near the roads. The fifty

¹⁸ Report of the Superintendent to the Yellowstone National Park, 1886, 7; Pyne, *Fire in America*, 118.

soldiers Harris commanded did not prove a high water mark. Even as the number of soldiers in residence grew, in a park of more than two million acres, there were never enough to provide the combination of coercion and suppression that comprised early fire management. Military resources for park management were limited and their capabilities even more scant. Soldiers were not trained in firefighting in a systematic manner and remained defenseless against a major fire. They were able to fight smaller fires with some success, suppressing such fires repeatedly mostly by very difficult labor.

By the early 1890s, the military officers who served as the superintendents of the park had come to regard fire as their greatest challenge. They could control most of the other issues that vexed them. They could manage vandalism, serve the growing numbers of tourists, and track and arrest poachers and other violators. Their troops were sufficient in number and a prominent enough presence to handle such matters. Fire posed a much larger threat. Not only did no such thing as fire training exist, any large blaze could easily overwhelm the limited resources at the park's disposal. Although no major fires marked 1887 or 1888, officers recognized that their situation was precarious. Arson remained a problem. Although one case resulted in the arrest of a man who had argued with officials and then set a fire as retribution, Army officers continued to attribute most fire to arson. Additional troops requested in 1887 arrived at Yellowstone in July 1888, expanding fire-fighting capabilities, but the park still needed more soldiers to fight the numerous small fires and to counter the ever-present threat of a larger fire.¹⁹

In summer 1889, the northern Rockies exploded in flames and Yellowstone National Park experienced its most difficult season in a number of years. The new park superintendent, Captain F. A. Boutelle, who succeeded Harris in June 1889, continued the strong leadership that Harris began and that Boutelle had learned in a career in the western military. Boutelle was a veteran of more than twenty years in the Army, including an important role in the Modoc War of 1872, and he brought the forcefulness that marked his military tenure to fire fighting. Boutelle emerged as the most prescient of the early park commanders, implementing a comprehensive program to fight fire. Boutelle's men built a system of roads, installed telegraph and telephone wires in the park, purchased new equipment to fight fires, and compelled travelers to stay in the campgrounds. When fires broke out that summer, Boutelle showed decisive leadership and garnered attention from important magazines such as *Forest and Stream* as well as from national newspapers.²⁰

Boutelle found himself a darling of the early conservation movement, with the already famous George Bird Grinnell his leading champion. A member of the patrician class only beginning to become interested in civic affairs, Grinnell was a leader in promoting the concept of *noblesse oblige*, the perceived obligations of the well-born to improve their society. He helped found the Audubon Society, the Boone and Crockett Club, and other late nineteenth-century conservation and culture organizations, and he published *Forest and Stream*, a newsletter that became a leading conservation magazine. Grinnell endorsed Boutelle's strategies; the captain "displayed an amount of energy and

¹⁹ Report of the Superintendent to the Yellowstone National Park, 8-9; "No Railroad in Yellowstone Park," *Forest and Stream*, February 18, 1886; "Fires in the National Parks," *Forest and Stream*, October 7, 1886.

²⁰ "Putting Out the Fires," *Forest and Stream*, July 25, 1889; Robert Utley, *Frontier Regulars: The United States Army and the Indian, 1866-1891* (New York: Macmillan, 1973), 205-13.

decision which promises great things for the future of the Park,” Grinnell wrote at the height of the 1889 fires.²¹

Grinnell’s enthusiasm for Boutelle’s efforts reflected more than a decade of elite concern about fire in the West. Harvard Professor Charles S. Sargent had included a map of the burned area and extensive commentary about fires in the 1880 census in his *Report on the Forest of North America (Exclusive of Mexico)*, published in 1884. The American Forestry Congress of 1882 had targeted fire as a threat to the nation’s forests. Several immense, lethal fires had swept the Great Lake states, the most recent in 1881 in Michigan. By 1886, when soldiers arrived at Yellowstone, many sought institutional means of controlling the outbreaks. The Adirondacks Preserve, established in 1885 with a ranger force to patrol its boundaries, and “fire-rangering” adopted by Ontario and Quebec around 1885 provided prominent examples of this response. A comparative colonial perspective, particularly with the British and French, also existed. The British had created a system of forest reserves in the 1870s, and the opening question asked at the first conference among its on-the-ground foresters was whether fire control was feasible and desirable. There were serious disagreements, but the crucial experiments were conducted by military units.²² Early foresters and those who looked to Europe for examples were well aware of such conceptualizations, but the national parks were the first places where the United States government entered the situation.

In this setting, Grinnell embraced the idea of suppression as a military obligation, emboldening Boutelle. The Army’s job was to put out fires in the park, and Grinnell insisted that the departments of Interior and War devote more resources to Yellowstone. Boutelle had vociferously protested the lack of resources for fire fighting and his complaining incurred the wrath of Secretary of the Interior John W. Noble, who contemplated the superintendent’s dismissal. Grinnell’s praise of the superintendent’s aggressive fire suppression strategy encouraged the officer to push even harder. His ongoing disagreements with the secretary, while productive in establishing a formal suppression policy and patterns of resource deployment, led to his removal late in 1890.²³

The dispute that led to Boutelle’s dismissal illustrated another way in which fire management was different from other forms of park management. Fires demanded immediate action and required the application of considerable resources. Boutelle found that when fire struck it took all the resources he had at his disposal. He needed more. Larger numbers of men permitted a greater initial response to fire, which in most

²¹ *Forest and Stream*, February 16, 1886, 62; *Forest and Stream*, October 7, 1886, 1; *Forest and Stream*, October 14, 1886, 226; “Putting Out the Fires,” *Forest and Stream*, July 25, 1889, 1; John F. Reiger, *American Sportsmen and the Origins of Conservation*, revised ed. (Norman: University of Oklahoma Press, 1986), 32-34, 60-62, 93-142.

²² Stephen J. Pyne, *Vestal Fire: An Environmental History, Told Through Fire, of Europe and Europe’s Encounter with the World* (Seattle: University of Washington Press, 1997), 442-46; Charles S. Sargent, *Report on the Forest of North America (Exclusive of Mexico)* (Washington, D.C.: U.S. Government Printing Office, 1884).

²³ Report of the Superintendent of the Yellowstone National Park, 1888 (Washington, D.C.: Government Printing Office, 1917), 4; Report of the Superintendent of the Yellowstone National Park, 1889 (Washington, D.C.: Government Printing Office, 1917), 5; Report of the Superintendent of the Yellowstone National Park, 1890 (Washington, D.C.: Government Printing Office, 1917), 5; Hampton, *How the U.S. Cavalry Saved Our National Parks*, 97-99; Doug Weber, “Fighting Fire with Firepower: Firefighting in Yellowstone National Park, 1872-1918,” *Yellowstone Science* 8 3 (Summer 2000), 2-5.

circumstances limited the spread of fires. From Boutelle's perspective, the solution was easy. From the secretary's point of view, Boutelle's charge of inadequate resources disparaged department management. Worse, it was amplified by the support of Grinnell and other conservationists, who made the secretary's prerogative into a topic of discussion. Two tendencies converged in the dispute - the limitations of national park administration in the era and the immediate need to address the outbreak of fire with abundant resources that Yellowstone National Park did not possess. The two reinforced one another, leading to further internal pull and an inherently reactive response. A pattern characteristic of early conservation that ever after marked park and fire politics dated to the genesis of suppression regimes. Evident at the inception of fire management in national parks, this battle over policy and procedure repeated itself perennially.

The military served more effectively as a deterrent than as a fire-fighting force. Soldiers prevented people from starting fires by restricting their location and by monitoring their activity within the park. In 1892, Captain George S. Anderson, who succeeded Boutelle on February 15, 1891, reported that he and his men faced countless fires during the season, but managed to extinguish them by a "ceaseless and numerous system of patrols."²⁴ Anderson's observation seemed to support Boutelle's position, and it also led to further emphasis on centralizing the locations in which visitors camped. Since most park fires were started by visitors, a process that kept the people most likely to be careless in a fixed area made a daunting task more manageable. In this, the Army's capacity to deter served as its greatest asset.

Through most of the 1880s, Yellowstone stood alone as the American national park. Only Mackinac Island, a small area designated as a national park only between 1875 and 1895, followed until 1890, when Congress established Sequoia, General Grant, and Yosemite national parks.²⁵ At the same time, federal administrative control of lands near national parks was extended when Congress created the first forest reserves around Yellowstone in 1891. Created under the auspices of Amendment 24 to the General Appropriations Act of 1891, forest reserves received no more direct or immediate resources than had Yellowstone at its establishment. While the forests stood without protection, Army troops were sent to the new generation of national parks under the same terms and conditions that propelled it to Yellowstone. In these newest creations, troops faced many of the same issues they had throughout their service in the nation's first national park.²⁶

All three new national parks shared the "Big Trees," the sequoias and redwoods that propelled preservation efforts in California and proved more difficult to manage than monumental scenery or charismatic animals. Unlike Half Dome or Tower Falls, trees were intimately connected to fire. Fire burned cavities into them; fires swept around their trunks almost annually at the time of earliest European reports. Suppression as practiced

²⁴ Report of the Superintendent of the Yellowstone National Park, 1892 (Washington, D.C.: Government Printing Office, 1917), 4-5; "Shepherders and the National Parks," *Forest and Stream*, August 4, 1894.

²⁵ Alfred Runte, Jr. *Yosemite: The Embattled Wilderness* (Lincoln: University of Nebraska Press, 1990), 1-15, makes the case for Yosemite as the nation's first national park.

²⁶ Harold K. Steen, *The United States Forest Service: A History* (Seattle: University of Washington Press, 1976), 22-47; G. Michael McCarthy, *Hour of Trial: The Conservation Conflict in Colorado and the West, 1891-1907* (Norman: University of Oklahoma Press, 1977), 11-17; David A. Clary, *Timber and the Forest Service* (Lawrence: University Press of Kansas, 1986), 3-6.

had the combined affect of changing the ecology of the area around the Big Trees and altering a historic landscape by excluding a primary catalyst of earlier change. No less than Gifford Pinchot noticed the contradiction. When told that area residents had “saved” the Kaweah Big Trees from fire twenty-nine times, Pinchot wondered aloud who saved them during the previous 4,000 years.²⁷

Of the three new parks, Yosemite enjoyed an iconic status by the 1890s that increased the demands on its new military overseers. By 1890, John Muir had become “John of the Mountains,” the most famous figure in early nature preservation, and San Francisco had developed from a vigilante frontier town into the premier city and economic center of the West. At the same time, California had stepped to the fore in the complicated embrace of Romanticism, empiricism, and anti-modernism that so strongly foreshadowed the rise of legislated conservation. For an urban society grappling with a sense of loss that stemmed from rapid growth and rampant socioeconomic inequity, the beauty and serenity of Yosemite epitomized the cost of this transition.²⁸

However, Yosemite was also a real place, beset by serious management problems that predated national park status. As a state park from 1864 to 1890, it had become the best example of the struggle between preservation and use that so completely dominated early national park history. Yosemite quickly attained national prominence and Americans focused on the region as the locus for their as yet undefined national identity, an emblem of what made the relationship between the American nation and the land it inhabited special. Tourism bustled in the area even before the 1864 Yosemite Park Act, and by the 1880s, a series of problems had become evident. Not only did the establishment of a state park fail to guarantee protection, the cultural meaning of the new park in a rapidly industrializing society brought streams of visitors. The pressure from visitors and interested parties in California grew. The Yosemite Park Commission, a state-appointed entity, was charged with administration of the park, but it was not well equipped to manage what rapidly became an important emblem of American nationhood.²⁹

As was the case at Yellowstone, human use of fire to reshape Yosemite preceded the founding of the United States. The Ahwahneechee people who long lived in the Yosemite Valley had used fire to arrange their environment for their own benefit, a practice common among Native peoples across the continent. They prized the black oak, a species that thrived on sunlight, for its black acorns, and systematically fired the region to burn pine, incense cedar, and other less hardy saplings. The black oak trees multiplied when the understory of saplings were removed, creating a vision of an open valley. Despite the removal of Native Americans from the park in the early 1850s, long-term use of fire resulted in relative stasis in the Yosemite Valley. For at least the twenty-year period between 1850 and 1870, the valley floor looked much the same. After Native Americans were removed from the valley, they returned seasonally to engage in historic

²⁷ Gifford Pinchot, *Breaking New Ground* (New York: Harcourt Brace, 1947), 44; Pyne, *Fire In America*, 302.

²⁸ T. J. Jackson Lears, *No Place of Grace: Anti-Modernism and the Transformation of American Culture, 1880-1920* (New York: Atheneum, 1980), 3-7; Stephen J. Pyne, *How the Canyon Became Grand: A Short History* (New York: Viking, 2000), xi-xv, 12-22; Michael P. Cohen, *The Pathless Way: John Muir and American Wilderness* (Madison: University of Wisconsin Press, 1984), 271-72, 288-90.

²⁹ Runte, *Yosemite*, 15-37; Shaffer, *See America First*, 261-310.

practices, firing the saplings to allow mature trees to flourish and maintaining the rough equivalent of the biology they created before whites arrived to ultimately displace them.³⁰

By the 1870s, visitors to the valley floor reported a severe decline in the overall number of trees. Not only had the undergrowth that been the focus of regular burning disappeared, so had the thick stands of timber that had helped sustain Native American life. Increased plowing and grazing also led to a more open valley. Later scientists attributed this change to the compacting of the soil that accompanied increased agriculture. The vista was remarkably different: instead of the thick stands of black oak of the 1850s, the valley in the 1870s showed open fields and young pines and cedars.³¹ The spectacular valley had been altered by the combination of fire suppression and more extensive agriculture and animal husbandry. The same transformation had taken place at lower elevation as well.

As a state park, Yosemite had been consigned to the care of the Yosemite Park Commission, an entity created by the state of California. Its members had first been appointed in 1864, and for the next twenty-four years, the commission administered the park. Although famed landscape architect Frederick Law Olmsted was the initial chairman, he soon departed, leaving the park in the hands of less creative people. Throughout most of their tenure, the Yosemite commissioners functioned as a development agency. They promoted roads and local business interests and sought to support all forms of development. The Department of the Interior opened lands along the park's boundary to settlement, adding another constituency for the commissioners. Throughout most of their era, the commissioners worked closely with mining and timber interests, and as a result, considerable acreage moved into private hands.³²

The commissioners managed from a distance, deaf to the growing number of competing interests near the park. Although they saw themselves as managers of a park, their desire to preserve scenery was closely tied to its ability to make money. Their annual reports most often treated the park as an economic asset. They regarded its ability to generate revenue as a prime value, noting the growth of young merchantable timber in the lowlands in 1885-86, evidence of a successful suppression regime. For the better part of twenty years, this modicum of supervision sufficed even as enthusiasm for Yosemite grew in ways the commissioners did not see.³³

In 1889, the viability of this form of management ended. During the summer, a fire swept the famed Mariposa Grove. The suppression regime, imperfect as it was, created a context in which uncontrolled fire had disastrous consequences. The Yosemite Commission was poorly prepared to address fire. Its officers sought culprits. "That most despicable of crimes, forest arson, the result of carelessness on the part of campers or design on the part of shepherders, turned the surrounding forest, outside the jurisdiction

³⁰ C. Kristina Roper Wickstrom, "Issues Concerning Native American Use of Fire: A Literature Review," Yosemite Research Center, Publications in Anthropology No. 6 (1987); Mark David Spence, *Dispossessing the Wilderness: Indian Removal and the Making of the National Parks* (New York: Oxford University Press, 1999), 101-08; Runte, *Yosemite*, 10-12, 38.

³¹ George Gruell, *Fire in Sierra Nevada Forests: A Photographic Interpretation of Ecological Change Since 1849* (Missoula, MT: Mountain Press Publishing, 2001); Runte, *Yosemite*, 39.

³² Runte, *Yosemite*, 22-24, 49-53; Meyerson, *Nature's Army*, 265.

³³ "Report of the Commissioners to Manage the Yosemite Valley and the Mariposa Big Trees, 1889-1890," (Sacramento, CA: Superintendent of State Documents, 1890), 6; Spence, *Dispossessing the Wilderness*, 102.

of this commission, into a flood of fire,” the annual report of the commissioners averred. “The fire at times almost surrounded the Great Sequoia Grove and invaded it at many points.” In one signal event, the inadequacy of the existing system was exposed. The cause and effect became inverted and the presumptive solution, complete suppression, transformed the grove over the subsequent seventy years.³⁴

The Mariposa Grove fire played a catalytic role in the demise of the Yosemite Park Commission and the arrival of federal troops to administer the park. The fire was widely regarded as final proof of the commission’s inept management, and in a changing nation, Yosemite was seen as a sufficiently significant symbol to merit national protection. The commission’s existence was under assault before the fire. The powerful conservation group that surrounded John Muir and that included Robert Underwood Johnson, the editor of *Century* magazine; Stanford University President David Starr Jordan; attorney Warren Olney, later the reform-oriented mayor of Oakland, California; scientist Joseph LeConte, a University of California professor who shaped science throughout California; Charles Robinson, an artist in Yosemite with an exaggerated sense of his own importance and a number of influential friends; and others, attacked the commission and sought to include the Mariposa Grove in the larger national park they planned.

The Southern Pacific Railroad noted the advantages other railroads gained from conveying tourists to Yellowstone and pushed for national park status at Muir’s and his friends’ behest. A timely introduction of the park bill at the end of a congressional session led to easy passage, and on October 1, 1890, President Benjamin Harrison signed the new park into law.³⁵ Yosemite National Park was now the responsibility of the federal government.

The leading environmental figure of his time, Muir had strong feelings about fire. Imbued with a sense of the forests as sacred, he adamantly opposed burning, denouncing it as a much more severe waste than even logging. Muir detested sheep and their herders, and as a result, opposed the herders’ fires, no matter what their purpose.³⁶ Muir’s pronouncements reiterated the characteristic link between bad fires and bad people, a hallmark of the military’s suppositions about fire and its management. In his famous account of two fires, he wrote of one roaring through chaparral slopes that, upon reaching the top, then slipped quietly through the open forested understory. In Muir’s day, the emphasis was on the raging blaze. A later generation read that landscape differently, placing its emphasis on the quiescent burn.

³⁴ “Report of the Commissioners to Manage the Yosemite Valley and the Mariposa Big Trees, 1889-1890,” 7-10. There is some debate about the frequency of fire in the Mariposa Grove. In his November 8, 1890 report to the Secretary of the Interior, Lt. George Davidson notes that the “effects of the fire that swept through the grove in fall of 1888 are painfully apparent.” T.W. Swetnam, C.H. Baisan, A.C. Caprio, R. Touchan, and P.M. Brown, *Tree-Ring Reconstruction of Giant Sequoia Fire Regimes* (Final Report on Cooperative Agreement No. DOI 80181-0002, Sequoia and Kings Canyon National Parks, California, 1992), indicates no tree-ring evidence of fire in the grove in 1888. It is possible that Davidson was mistaken in the date for the fire. There are accounts of fire in July of 1889 and it may be that Davidson accepted an inaccurate report of when the fires occurred.

³⁵ Runte, *Yosemite*, 52-55; Frank Norris, *The Octopus: A Story of California* (New York: Doubleday and Sons, 1901); Muir’s group soon became the founding members of the Sierra Club; see Michael P. Cohen, *The History of the Sierra Club, 1872-1970* (San Francisco: Sierra Club Books, 1988).

³⁶ Cohen, *The Pathless Way*, 288-90.

In 1890, Secretary of the Interior John W. Noble created the first general regulations for national park use. He added specific rules for the three new California parks, General Grant, Sequoia, and Yosemite, for they were more heavily used than Yellowstone. Most important among the regulations was Point 6, which made it illegal to “start or kindle or allow to be started or kindled any fire in grass, leaves, underbrush, debris or dead timber down or standing.” Anyone who started a fire would be liable for the financial damage it caused, a stiff penalty for the largely impecunious homesteaders of the upper Sierras.³⁷ The secretary’s rules enshrined suppression and insisted on individual control.

Timber cutting and fires that resulted from the needs of tourists also created management issues in the California parks. On an inspection trip in support of the congressional inquiry into the practices of the Yosemite Park Commission, Department of the Interior Special Land Inspector Thomas Newsham discovered that significant numbers of trees had been cut away to provide visitors with better views of Bridal Veil and Yosemite Falls. “Below this, some distance, there are evidences of a recent fire caused by some tourist campers,” he wrote Secretary Noble, “but I am glad to say that it did not extend very far.” Newsham observed thousands of young pine and cedar and other trees, which he expected, “if left undisturbed, will soon make beautiful groves over most of the floor of the Valley.” Management had become a struggle between present uses and future opportunities: a resurgent forest would overwhelm the valley and pose a fire hazard, particularly on slopes away from the valley proper.³⁸

An ongoing debate that centered on fire had already begun. Since the advent of federal management, the combination of loose hierarchical structure and limited resources combined to open the way for a range of proposals. In 1890, a representative of the U.S. Coast and Geodetic Survey advocated the employment at the Mariposa Grove of a “young, active, sensible, and conscientious Guardian, appreciating what is needed and proud of the responsibility of such a trust, with one or more assistants of similar character, would soon give a sense of security against fire.” This conception, ahead of the arrival of troops, became the baseline for management. It did not reflect the ongoing reality that sheepherders and those outside park boundaries neither appreciated nor respected Yosemite and “acts of spoliation and trespass,” as official documents referred to such incidents, continued unabated after the transfer to federal administration. As at Yellowstone, a response to fire was integral at the park even before the arrival of the cavalry.³⁹

The arrival of troops at Yosemite in summer 1891 transformed the day-to-day operations of the park. When forty-six-year-old Captain Abram E. “Jug” Wood arrived with his troops, they found circumstances that differed from Yellowstone in one crucial

³⁷ Secretary of the Interior, “Rules for National Parks,” NARA, RG 79.2.1, Correspondence from Yellowstone, 1877- (microfilm), National Archives, College Park, MD.

³⁸ Thomas Newsham to Secretary of the Interior, November 24, 1890, NARA, RG 79.2.1, Records of the Office of the Secretary of the Interior Relating to National Parks, Box 89.

³⁹ Lt. George Davidson, “Report on the Alleged Spoilations in the Yosemite Valley,” November 8, 1890, NARA, RG 79.2.1, Records of Office of Secretary of the Interior Relating to National Parks, Box 89; “Reports of the Secretary of the Interior Relative to Yosemite Park, 1892” (Washington, D.C.: Government Printing Office, 1893), 4; “Report of the Acting Superintendent of the Yosemite National Park to the Secretary of the Interior 1891” (Washington: Government Printing Office, 1891), 8.

respect. A small cabal called the “Yosemite Ring” controlled the region, and its leaders resented federal intrusion. This was not new in the West. But because of the efforts of Muir, Underwood, and others, events at Yosemite were debated around the country. The degree of press scrutiny in the Yosemite region was atypical. In this climate, military rectitude was a prized commodity and Wood was more than equal to the task. He carried out his mandate with the upright aplomb that resulted from his thirty years in the Army.⁴⁰

Fire loomed large among the issues Wood and his men faced. The variety of human use, increasing visitation, and tension between the Yosemite Ring and the military led to different kinds of fire. Suppression made natural fire more threatening due to increased loads of flammable underbrush; accidental fire caused by tourists posed an even greater threat because of its proximity to inhabited areas; and malicious fire set by opponents of the park and federal administration heightened the danger. As at Yellowstone, most fire resulted from the carelessness of visitors. Yosemite’s fire policy became proactive prevention and reactive suppression.

Wood pursued a policy that effectively managed the narrow space between ideals of aesthetic beauty and the economic goals of tourist endeavor. The Mariposa Grove had acquired an almost sacred position in the pantheon of the American spectacular, and protecting it took on added importance for the Army. The fires of 1889 set off a chain reaction of response that prompted the military to take proactive action. In its annual report after the fire, the Yosemite Commission advocated protecting the Mariposa tract by “surrounding it with a border over which a fire can not so readily pass.” Implementation of this barrier fell to Wood and the military. His men constructed a perimeter road and cleared dead and downed wood in 1892 and 1893. The debris was piled and burned in a systematic fashion, creating an open zone around the grove that enhanced its unique qualities and further enunciated the advantages of the Army presence.⁴¹ As a result of the Mariposa Grove blaze, the military’s aggressive actions to assure that it did not recur, and the growing national importance of Yosemite National Park, fire gained a new place as a widely feared adversary of national parks. Military suppression also climbed a notch, as did the concept of proactive management.

Conversely, the clearing around the grove added another dimension that fit with the values of early conservation. By removing downed trees and underbrush around the big trees, the military contributed to the designation of the area as sacred space, apart from the profaned space of human living and industry. This articulation meshed perfectly with the Sierra Club’s standard. The pattern that dominated the first century of American conservation had been set, and fire and the Army’s response to it played a role in reinforcing those designations.

Despite such efforts, national parks remained undefined in a national context and the military encountered people who had used the park for commercial extractive endeavor before its establishment and did not respect the values of conservation. Destruction of timber in and near the park continued, much of it left laying around, creating a possible fire hazard. Agricultural development added barbed wire to the problems of management, further dividing land and limiting the impact of military patrols. Some plants diminished in number, further evidence of human impact and of the

⁴⁰ Meyerson, *Nature’s Army*, 93-97.

⁴¹ “Report of the Commissioners to Manage the Yosemite Valley and the Mariposa Big Trees, 1889-1890,” 6-7; Meyerson, *Nature’s Army*, 97-98.

danger of ever-growing settlement in the region. By 1892, the Yosemite Valley floor looked as if it were a “poorly managed cattle ranch,” in the observation of General Land Office Special Agent Capt. John S. Stidger. The park neither preserved the natural setting nor protected resources from potential calamity.⁴²

Fires continued to vex not only Yosemite National Park, but the entire Sierra Nevada region. The 1890s represented a significant change in management efforts, for federal officials, General Land Office special agents prominent among them, began to visit and review land use practices throughout the Southwest. Homesteaders and ranchers had raised crops and animals without oversight for at least a decade, and as occurred elsewhere in the West, they resented the appearance of federal officials. They viewed fire as an essential component of their lives, something they simultaneously feared and relied upon and federal officials noticed and commented on this feeling. In a famous instance from the Plumas Forest Reserve in California in 1904, a forest supervisor noted that “the people of the region regard forest fires with careless indifference The white man has come to think that fire is a part of the forest, and a beneficial part at that. All classes share in this view, and all set fires, sheepmen and cattlemen on the open range, miners, lumbermen, ranchmen, sportsmen, and campers. Only when other property is likely to be endangered does the resident of or the visitor to the mountains become careful about fires, and seldom even then.”⁴³

Faced with a level of authority they neither understood nor inherently respected, such people evinced a wide gamut of responses. Intentional fire was among them. Some uses of fire, such as burning dry pasture, had historic precedent, but when they caused damage to the trees that were so prominent in the national imagination, federal officials responded. Though later studies of tree-rings suggest that fire in the region actually declined after 1864, a perceptual battle that reflected predispositions about the uses of fire took shape. That battle frequently pitted local people against the new federal system.⁴⁴

The same tension was evident at Sequoia and General Grant national parks, the other two new additions designated in 1890. The Giant Forest at Sequoia loosely mirrored the Mariposa Grove at Yosemite and the minuscule General Grant served almost as a non-contiguous section similar to the Minaret area of Yosemite. At Sequoia, when Capt. J.H. Dorst and Troop K of the 4th Cavalry arrived in summer 1891, they found conditions and conflicts that roughly paralleled those at Yosemite. Dorst observed the same resource questions that so troubled Wood and his Army successors at Yosemite, in particular the struggle to protect the park when the state owned the surrounding resources. Cutting of state timber had become an especially dangerous source of fire, Dorst noted, and he advocated transfer of much of the surrounding state timberland to the park as a way to limit the threat of fire. In his estimation, the state was too vulnerable to local constituencies to provide adequate protection for the park and its resources.⁴⁵

⁴² “Reports of the Secretary of the Interior Relative to Yosemite Park, 1892,” 7-10.

⁴³ Pyne, *Fire in America*, 102.

⁴⁴ U.S. Attorney General Richard Olney to Secretary of the Interior Hoke Smith, September 28, 1894, NARA, RG 79.2.1, Records of Office of Secretary of the Interior Relating to National Parks, Box 89.

⁴⁵ “Brief Report of Captain J.H. Dorst, Acting Superintendent of Sequoia National Park,” ca. 1891, NARA, RG 79.2.1, Letters Received by Office of the Secretary of the Interior Relating to National Parks, Sequoia and General Grant 1890-1907, Box 47; Lary M. Dilsaver and William C. Tweed, *The Challenge of the Big Trees: A Resource History of Sequoia and Kings Canyon National Parks* (Three Rivers, CA: Sequoia Natural History Association, 1990), 66-72.

Sequoia and General Grant soon mirrored Yellowstone and Yosemite in their struggles with fire. The Army responded to the fires it saw, mostly lighting fires near inhabited areas or those started by people. Backcountry lightning fires burned out of view. Each summer, fires erupted with a frequency related to the carelessness of visitors and the actions of cattlemen and shepherders. A significant percentage of the cavalry's work hours were devoted to containing fires within the parks. Most blazes were small, requiring a single detachment and a few days to bring them under control. Occasionally, fires spread or separate blazes merged and containment became more difficult, but rarely did they threaten property or life. The consistency of fire suggested some level of intentional burning, which in turn led to a closer look at resource extractive activities in the immediate region.⁴⁶

In the late nineteenth-century Department of the Interior, the GLO took responsibility for most investigations on public lands. Its staff of special agents was among the most dynamic and experienced members of the federal land bureaucracy. Beginning with the Homestead Act of 1862, they investigated homestead, timber, Timber and Stone Act claims, and countless other situations throughout the West. As late as the 1890s, before the increase in the number of federal land management agencies that accompanied the Progressive Era, the GLO still assessed most land and resource questions. A GLO special agent was the natural choice to assess patterns of resource use and its impact on federal lands in Sierra Nevada.⁴⁷

During summer 1894, the GLO dispatched Special Agent W.F. Landers to the Sierra to investigate the causes and effects of forest fires. This characteristic response to the growing questions of the region marked a belated effort to bring the experience of the federal government to the complicated situation in the California Mountains. After a summer of observation, Landers concluded that the actions of shepherders, still prominent in the California mountains, were the primary cause of forest fires. After pasturing their animals on public lands in the summer, sheepmen drove their flocks to lower elevations, and in a time-honored practice, returned to the uplands to set fire to trees and meadows to create pasture for the following season. These were hardly unusual practices. Native Americans had engaged in broadcast burns along routes of travel and for resource extraction for as long as they been in the mountains, and throughout the West, immigrants from the Basque region of Spain and other shepherders had undertaken similar practices. Although he did not believe cattle were a major source of the problem, Landers discovered that cattle and sheep men in the area had created a rationale for continuing their practices. They firmly believed that forest fires helped rather than hurt the big trees.⁴⁸

Landers's research suggested that fire management in the California mountains was as much a problem of perception as it was of practice. Local practice challenged the military construct formulating the battle between suppression and fire use as a struggle

⁴⁶ J. H. Dorst to Secretary of the Interior, August 4, 1892, NARA, RG 79.2.1, Letters Received by Office of the Secretary of the Interior Relating to National Parks, Sequoia and General Grant 1890-1907, Box 48.

⁴⁷ E. Louise Peffer, *The Closing of the Public Domain: Disposal and Reservation Policies 1900-50* (Palo Alto: Stanford University Press, 1950), 8-31, 43-44.

⁴⁸ W. F. Landers, "Report on the Investigation of Causes and Effects of Forest Fires in California," September 1894, NARA, RG 79.2.1, Letters Received by Office of the Secretary of the Interior Relating to National Parks, Sequoia and General Grant, 1890-1907, Box 49.

between good and evil. To successfully implement a suppression policy, the cavalry needed to battle fire before it started, to engage in a program of education and dissuasion as it had at Yellowstone and Yosemite. But Sequoia and General Grant national parks presented a new challenge. At Yellowstone and Yosemite, the cavalry was asked to manage land within park boundaries, a task for which its numbers and skills were admirably suited and where its influence was at its greatest. At Sequoia and General Grant, most of the threats to the parks took place outside of their boundaries. And many of the culprits only traversed the region seasonally, making an ongoing campaign of behavior modification a far more difficult task. Although troops could manage the park and make inroads on other federal lands, it could not easily compel changes in behavior outside the park.

Yellowstone had already experienced major fires but Yellowstone's fires were very different from those in California's Sierra Nevada. Typically, Yellowstone experienced crown fires through lodgepole pine, except in the Lamar Valley and similar winter ranges where fires burned through grasses and shrub. The Sierras experienced surface fires through various pine, chaparral, and fir complexes. That the Army reflected on its Yellowstone experience to assess the Sierras suggested a disadvantage in having a single agency manage two ecologically different parks. Officers inaccurately transferred experience from one setting to the other.

The result of this transfer led to the implementation of programs at odds with the goals that the Army set out. At Sequoia in 1898 and 1899, a series of fires of significant magnitude allowed for the change in the calculus of fire and permitted the introduction of a Yellowstone-like set of proscriptions inside the park. In August 1898, an extensive forest fire spread throughout the northwest section of the park. A combination of state forestry agents and the cavalry had little success containing the fire, and it spread wildly until it burned itself out in late August. Although the fire did not harm the Giant Forest, the grove of Sequoias that gave the park its name, it did introduce a new fear of fire in the region. A state forestry agent was injured fighting the fire, the first such known case at Sequoia. The next year, two more fires burned out of control in the northwest part of the park. Both started outside Sequoia and appeared to be intentional, presumably set by herdsman.⁴⁹

Two summers of major fires allowed the Army to institute changes in its park fire management policies. In 1898, J.W. Zaveley, a GLO special investigator who served as acting park superintendent, used the fires to exclude 20,000 sheep from the park and to remove any remaining sheep from General Grant National Park as well. Zaveley's bold move was an initial step that eliminated only half the problem. It did remove animals from the parks, but it could not address actions that took place outside of the park but affected its resources. Captain Henry B. Clark, the acting superintendent, continued Zaveley's policy, asking to extend his troop's stay in the park until November 1, 1899, in an effort to combat both fires and trespassing hunters. He also confirmed the reactive strategy that Zaveley had begun. Clark articulated a policy that put the Giant Forest first, and together the two made protecting the large trees from the effects of fire the park's

⁴⁹ J. W. Zaveley to Secretary of the Interior, August 4, 1898; Henry B. Clark to Secretary of the Interior, September 30, 1899, NARA, RG 79.2.1, Letters Received by Office of the Secretary of the Interior Relating to National Parks, Sequoia and General Grant 1890-1907, Box 49.

primary fire-fighting priority.⁵⁰ The sacred-profane distinction so prevalent in early conservation extended even to the objectives of firefighting.

In the new century, the Army remained the primary protection force in the large western national parks. As a result, it spread its doctrine of fire control, establishing a pattern of aggressive firefighting. In essence, military practice in the national parks created the paradigm that dominated firefighting until the 1960s. The Forest Committee of the National Academy of Sciences accorded the military example sufficient respect that in 1896, it recommended the additional of forestry to the curriculum at West Point. The Army was to initiate a new entity that was trained in forestry and would design plans and procedures for the protection of the forest reserves. Despite this recommendation, the task fell to a civilian agency. But before the turn of the twentieth century, the combat model of firefighting was firmly established; it would remain a powerful influence in the national park system for the next three generations.

Even as the cavalry tried to establish clear practices and procedures for fire-fighting, the number of national parks speedily grew. Congress established Mount Rainier National Park in 1899 and Crater Lake National Park followed in 1902. Other parks, including Platt National Park in Oklahoma, later delisted and transformed into Chickasaw Mountains National Recreation Area, and Wind Cave National Park joined the collection. The passage of the Antiquities Act of 1906 allowed the creation of a second category of national park areas. These national monuments, as the category was called, could be created by executive proclamation without the consent of Congress, and the legislation was so vague that nearly anything on public land might be so designated. Following the proclamation of Devil's Tower, the first national monument, in 1906, national monuments rapidly proliferated. By 1910, there were almost two dozen, including the Grand Canyon in Arizona, Glacier Bay in Alaska, Pinnacles in California, and archaeological sites throughout the Southwest.⁵¹

During this same era, the administration of most federal forests was centered in the Department of Agriculture. Prior to that time, both the General Land Office and Gifford Pinchot's Bureau of Forestry held federally designated forest reserves, the consequences of the Forest Reserves acts of 1891 and 1897. Pinchot successfully argued for the transfer of lands to a new entity, the United States Forest Service that he was appointed to lead in the Department of Agriculture. This heir to the idea of a military forestry corps received responsibility for the forest reserves.⁵²

Ostensibly established to protect upstream watersheds, the forest reserves were generally a poorly managed and impractical arrangement. The new post allowed the enterprising Pinchot to combine his knowledge of forestry, his relationship to President Theodore Roosevelt, so close that many referred to Pinchot as crown prince of the

⁵⁰ J. W. Zaveley to Secretary of the Interior, August 4, 1898; Henry B. Clark to Secretary of the Interior, September 30, 1899; Henry B. Clark to Secretary of the Interior, October 31, 1899, NARA, RG 79.2.1, Letters Received by Office of the Secretary of the Interior Relating to National Parks, Sequoia and General Grant 1890-1907, Box 49.

⁵¹ Hal K. Rothman, *Preserving Different Pasts: The American National Monuments* (Urbana: University of Illinois Press, 1989), 33-49.

⁵² Char Miller, *Gifford Pinchot and the Making of Modern Environmentalism* (Washington D.C.: Island Press, 2002).

Roosevelt administration, and his need to gain management authority over most federal timberland. At the same time, he attained the autonomy and resources to implement his version of conservation, contained in the concept, “the greatest good for the greatest number in the long run.” A new and viable competitor for the leadership of fire management challenged the military.⁵³

The Forest Service was born at a complicated, contentious time. The manifestation of Progressive Era ethos, the agency grappled with the same duality about fire that vexed the Army. Fire was the enemy when it damaged personal property. When it burned far away or did not hurt others, it often did not rise to the level of immediate concern. Although fire damaged communities throughout the nation - from San Francisco in the aftermath of the 1906 earthquake to towns such as Chicago, Peshtigo, and Hinckley in the Great Lakes states - it seemed distant from the concerns of the nation. Fire had been an important tool for humans since time immemorial and like most tools that humanity utilized, it had risks. Yet, the prevalence of fire and its potential to destroy communities raised the level of attention that the issue received. Sorting out these two conflicting impulses created considerable tension for the Forest Service during its first half-decade.⁵⁴

Both the Army and the new USFS would be sorely tested in 1910, aptly titled the “year of the fires.” That summer, the inland Northwest erupted in flames, the result of lightning sparks, locomotives, and scattered humanity as well as the heaps of burnable fuel left behind by logging, mining, and construction crews. The previous wet winter, subsequent dry spring and a drought-like summer exacerbated conditions. A fire of epic proportions ensued, seeming only to worsen as the summer passed until finally, the Big Blowup of August 20-21, 1910, consumed towns, villages, railroads, mining camps, and anything else in its way.⁵⁵

Two national parks, Yellowstone and Glacier, established in May 1910, stood in the path of these fires. The Army had administered Yellowstone for almost thirty years and it had established a pattern of response to fire. By the late 1890s, the military listed fire suppression as one of its three main obligations at the park and in most years, its forces kept control of fire with brigades of men wielding picks and axes. During some years, such as 1901, fires burned beyond the capability of the Army. That summer, *Forest and Stream* reported “axes and shovels were the only weapons of use . . . water buckets are the best “side arm” a soldier can carry.” Despite assistance delivered by troops from Fort Keough, Montana, the blazes burned throughout the region until fall rains brought them to a close.⁵⁶

Fire attracted the attention of the park’s most renowned early chronicler, Hiram Chittenden, the engineer in charge of building Yellowstone’s road system. His *The*

⁵³ Miller, *Gifford Pinchot and the Making of Modern Environmentalism*; Steen, *The United States Forest Service*, 69-102.

⁵⁴ Pyne, *Year of the Fires*, 1-7; Hal K. Rothman, ed., “I’ll Never Fight Fire With My Bare Hands Again”: *Recollections of the First Foresters of the Inland Northwest* (Lawrence: University Press of Kansas, 1994), 139-77.

⁵⁵ Pyne, *Year of the Fires*, 2-3.

⁵⁶ Superintendent Capt. George S. Anderson, “Work of the Cavalry in Protecting the Yellowstone National Park,” *Journal of the United States Cavalry Association* 10 36 (March 1897), 6-7; “Report of the Acting Superintendent of Yellowstone Park, 1901” (Washington, D.C.: Government Printing Office, 1902), 4; “Fires in Yellowstone,” *Forest And Stream*, August 10, 1901, 102.

Yellowstone National Park had become the most widely read book on Yellowstone, the source for much of what the public knew about the park. By the 1905 edition, Chittenden recognized that fire was a primary park issue, a “source of anxious solicitude” for its military administrators. “The control of a forest fire,” he wrote, “is next to impossible except by the aid of rain.” Neither source of fire, human agency or lightning, could be entirely eliminated, but Chittenden believed that inside Yellowstone’s boundaries, suppression and education already had yielded important results. He also advocated a proactive program of fuel load management, breaking up dense masses of vegetation, the accumulated fuel load created by time and successful suppression, but he opposed using fire as a tool to accomplish this end. Despite Chittenden’s recommendations, little was done to lighten fuel loads and Yellowstone remained vulnerable.⁵⁷

In 1910, Yellowstone’s timber went up in flames along with the rest of the inland Northwest, and the Army provided the best possible response. Lightning far from the main roads ignited most of the park’s fires and high winds spread the blaze. A large area south of Yellowstone Lake burned, and new fires erupted throughout August and into September. In early August, more than 200 soldiers battled fire in the park. Despite adverse circumstances, they succeeded in stopping at least two of the outbreaks. Another remained out of control until a shift in the direction of the wind drove it toward Yellowstone Lake. Even as they fought fires, soldiers continued their preventive measures. Assiduous patrols of campsites helped keep new wildfires from starting, although at least four began when fires that were not entirely extinguished transformed into wildfires before the Army reached the scene. Fire cut off one troop of twenty-nine soldiers and backed it up against the lake. They managed to fight off the fire and escape with a few burns and considerable loss of equipment.⁵⁸ By all accounts, the soldiers performed valiantly, but their efforts usually had little direct effect on the fires.

Glacier National Park provided a different kind of challenge. Established in May, 1910, it lacked the history of fire management by the Army that marked some of the other national parks. Its administration complicated by the struggle between Pinchot and Secretary of the Interior Richard A. Ballinger, Glacier National Park was in the middle of being transferred from the Forest Service to the Department of the Interior when the fires broke out. Although Pinchot had enjoyed free reign of the Department of the Interior’s forests under Ballinger’s predecessor, James R. Garfield, Ballinger, an appointee of William Howard Taft, banned foresters from Department of the Interior lands. The clamor resulting from a scandal about the leasing of Alaskan coal lands ended with Pinchot’s departure from the Forest Service just months before the establishment of Glacier National Park. In no small part, that departure paved the way for establishment of the new national park.⁵⁹

Just as the fires began, Ballinger sent an inspection team to Glacier National Park. Typical of the survey parties sent out to assess land in the late nineteenth century, it contained scientists, officials from nearby national forests, and Ballinger’s personal representative, Chief Clerk of the Department of the Interior Clements Ucker. The

⁵⁷ Chittenden, *The Yellowstone National Park*, 242-44.

⁵⁸ Pyne, *Year of the Fires*, 116; “Fires in Yellowstone Park,” *Forest and Stream*, September 24, 1910, 494.

⁵⁹ James Penick, Jr., *Progressive Politics and Conservation: The Pinchot-Ballinger Affair* (Chicago: University of Chicago, 1968), 1-17.

fourteen men and their ten pack animals entered the park and found themselves in the middle of a maelstrom. For an entire week, the fires severed their communication with the outside world as a frantic Ballinger tried to reestablish contact. When Ucker extricated himself and his party and reached Fort Yellowstone on August 12, he announced that the park was a “veritable fire-trap.” Turning the circumstances of the dispute to his department’s favor, he announced that the Forest Service had done nothing to prepare for the fire season during its long tenure in the region – despite its desire to show the world it could control fire. As a direct result, Ucker insisted, blazes in the “Crown of the Continent,” as George Bird Grinnell had enthusiastically labeled the area in the 1890s, burned out of control.⁶⁰

Realistically, the Forest Service did no less at Glacier National Park than it did anywhere else in the inland Northwest. Fire simply spread beyond the capability of diverse and poorly manned agencies. At least 2.6 million acres of national forest land burned in the Northern Rockies and an additional 2.4 million elsewhere, and certainly much more land that was not counted was burned as well. The fledgling Forest Service was not equal to the task. At the time, individual foresters administered as much as one million acres, often by themselves. They possessed small budgets and had little access to additional resources. When foresters needed help, they recruited workers from local and regional populations. Sometimes the agency went to cities in the region such as Spokane, Washington, in order to find people to fight fires. By August, the agency had more than 5,000 firefighters on its payroll, but the number was nowhere near enough to stem the fires. Nor was the available technology equal to the blaze.⁶¹ By any legitimate measure, both the Forest Service and the Army performed admirably in their response to the Fires of 1910.

Ucker’s indictment attained some credence because of presumptions that the fires, in Glacier in particular, resulted from human malice. The Great Northern Railway had laid off a sizable number of workers earlier in 1910, leading some to contend that a combination of the newly unemployed and wayfarers started fires in order to secure work putting them out. The accusation contained some truth. Instances of individuals igniting fires and then landing on the firefighting payroll were common, but as an indictment of Forest Service policy at Glacier, the argument lacked credence. The most dangerous and destructive fires in the summer of 1910 started by lightning and grew in force and size precisely because they were far from human view.⁶² They were complemented by a welter of escape fires, railway burns, and miscellaneous incendiary events that tied up resources and contributed to the breakdown.

Despite such realities, the fires at Glacier National Park became part of the battle between Ballinger and Pinchot. At its core, this was a power struggle, over control not only of timber but of the very values of conservation as well. Although Pinchot had been ousted and Ucker’s subsequent belligerence was widely acknowledged, Pinchot had achieved control of the terms of the struggle. Not only was he far more adept at public

⁶⁰ Telegram, Clements Ucker to Franklin Pierce, August 10, 1910; Telegram, Clements Ucker to Franklin Pierce, August 12, 1910, NARA RG 79.7, Glacier National Park, General Records, Expenditures/Supplies/Materials/Fires, Box 22; Pyne, *Year of the Fire*, 109-11; Spence, *Dispossessing the Wilderness*, 77-90.

⁶¹ Rothman, “I’ll Never Fight Fire with My Bare Hands Again,” 66-89; Pyne, *Year of the Fires*, 201, 233.

⁶² Pyne, *Fire in America*, 243-45.

relations, he was acknowledged as a leader in scientific forestry. Even Ucker acknowledged that reality, calling on the Forest Service and the much over-taxed Army to respond to the crisis. Cost figured into his call for the Forest Service. Glacier's entire appropriation during its first year of existence was a mere \$15,000, a sum so small that its application to combat the fires would exhaust it in a matter of days. In contrast, the Forest Service appeared willing to carry the costs of fire fighting until Congress agreed to a special appropriation after the end of the fire season to cover all expenditures.⁶³

By early August, the fires were so overwhelming that Henry S. Graves, Pinchot's successor at the Forest Service, asked for the assistance of the Army at Glacier. Among the troops sent to the park was Company K of the all-African American Twenty-Fifth Infantry under command of Lieutenant W. S. Mapes. While other soldiers in the park found themselves with difficult but manageable tasks, Company K found itself doing the most difficult work. With two gangs of additional men, a thirty-seven-man crew of lumbermen hired by the park and a thirty-five man crew of Greek laborers offered by the Great Northern Railway, the Army company had to battle the most powerful blaze in the park. Social tension and differing goals complicated the interaction. Some of the hired crews refused to work more than a regular 7:00 a.m. to 5:30 p.m. schedule. The untrained laborers were only marginally useful until Lt. Mapes sandwiched individual workers between the soldiers. Disciplined troops outperformed the less trained workers in the brutal tasks associated with containing fires.⁶⁴

In the end, the combination of on-the-ground presence of even rudimentary firefighters and willingness to absorb costs until reimbursement gave the Forest Service control of the battle against the extraordinary fires of 1910 and ultimately over the culture, policy, structure, and organization of fire-fighting on public lands. Despite the acknowledgement that Forest Service efforts in the national parks and elsewhere amounted to little that brutal summer, only the Forest Service appeared ready to shoulder the enormous burden of fire fighting in the West.

In the two affected national parks, the results of the fires were devastating. At Yellowstone, the fires burned more than 60,000 acres and firefighting efforts drained the park's limited budget. The tourist hotels were not threatened as a result of the efforts of Major Benson and his troops. The military paid day laborers a total of \$12,550 to help the troops dig firelines and even tried back burning at one location, but their actions did little to slow or stop fires. By 1911, the park had begun to construct fire lanes, but Benson clearly recognized that the military had too few people and too little experience to manage the national park, fight fire, select salvage timber for sale or disposal, and maintain order.⁶⁵

At Glacier, about the same area, 60,000 acres, burned, and there the ability of the Department of the Interior to support its national parks was thrown into question. Much of the area in question had considerable value as a source of timber, but in park supervisor Major William R. Logan's estimation, little scenic value. The major fires were

⁶³ Telegram, Franklin Pierce to Clements Ucker, August 15, 1910, NARA RG 79.7, Glacier National Park, Expenditures/Supplies/Materials/Fires, Box 22; Pyne, *Year of the Fires*, 111.

⁶⁴ Superintendent, Glacier National Park to Secretary of the Interior, October 9, 1910, NARA, RG 79.7, Glacier National Park, Expenditures/Supplies/Materials/Fires, Box 22; Pyne, *Year of the Fires*, 117-22; Pyne, *Fire in America*, 244.

⁶⁵ Benson to Secretary of the Interior, October 27, 1910, Yellowstone Box Y-9, Letter Box-65, Yellowstone National Park Library; "Fire in Yellowstone," *Forest and Stream*, September 24, 1910, 494.

away from the areas frequented by tourists, but many were adjacent to the railway. The expenditures associated with the fire were astronomical, and the Department of the Interior had little but the park's basic appropriation, primarily allocated for road building, to cover its costs. Before the establishment of the National Park Service, individual parks received direct appropriations that were far from generous and usually earmarked for specific purposes. In the case of a cost overrun as at Glacier, the Department of the Interior needed to request an additional appropriation from Congress.⁶⁶

Glacier National Park provided a flashpoint for the tensions that would come to revolve around fire. Two important federal agencies, the Army and the Forest Service, grappled over control of an important dimension of land management with enormous implications for national parks. The Army pursued a mode of suppression derived from its experiences in other national parks since 1886, a pattern the Forest Service followed as it carved its own way in the world of land management. The Forest Service tried to rely on military help to fight fires in the national forests, extending the pattern begun in the national parks and firmly locking the suppression mandate of the Army in place, but the military declined to support the efforts of that agency.

Elsewhere among the national parks that summer, fire problems were minimal. Mount Rainier and Yosemite both experienced a number of fires, but they paled in comparison to the ones in the inland northwest. At Mount Rainier, the only fires that required action were the result of unattended campfires. Yosemite experienced a number of fires, including one that burned within one-half mile of the Mariposa Grove, but only that fire required the attention of troops. At Sequoia, the only notable fire resulted from blasting on a road project and Wind Cave and General Grant both experienced typical lightning strikes.⁶⁷

The 1910 fire season proved pivotal. Until that summer, the Army had taken the lead not only in managing national parks, but in fighting the fires that erupted in them. Although it could not claim success against fire in 1910, the Forest Service found its purpose that brutal summer. It became the lead federal agency for land management and was so shaped by the fires of 1910 that its culture of suppression not only replaced that of the Army, but superseded its vehement suppression as well. After the summer of 1910, national parks followed the Forest Service's lead in managing fire and for the better part of the subsequent fifty years. Suppression dominated that strategy.

Suppression had its vehement opponents, most notably California advocates of "light-burning." This practice, the regular burning of surface underbrush and litter, sprang from the conviction that routine burning had produced the forests, kept fuels down, and prevented larger fires. Also called the Indian way of forestry or in a pejorative variation, "Paiute forestry," light burning had been advocated in California as early as the 1880s. Settlers and timber owners saw light burning as a sure way to reduce fuel load and limit uncontrollable fire. As early as 1902, calls to cease total suppression because it increased fuel load emanated from ranchers and timber companies in the California mountains, leading to a struggle between federal representatives, at this time mostly the Army, and

⁶⁶ Franklin Pierce to Major W. R. Logan, September 7, 1910; W. R. Logan to Secretary of the Interior, September 14, 1910, NARA, RG 79.7, Glacier National Park, Expenditures/Supplies/Materials/Fires, Box 22; Pyne, *Fire in America*, 244.

⁶⁷ "Forest Fires of the Season of 1910 in National Parks," NARA, RG 79.7, Glacier National Park, Expenditures/Supplies/Materials/Fires, Box 22.

settlers.⁶⁸ A characteristic battle between national and local, the core dispute in the rise of federal land management agencies, took another of its many forms.

Light burning gained enthusiastic endorsements in 1909 and 1910. T.B. Walker, a timber owner near Shasta, California, had been a proponent of light burning for more than decade. Although federal managers in both the departments of the Interior and Agriculture pronounced the practice ineffective for large areas, Walker published an article for the National Conservation Commission in 1909 that described his practices. Another Shasta resident, G. L. Hoxie, a self-described timberman linked to the Southern Pacific Railroad, advocated mandatory light burning the following year in a piece in the influential *Sunset* magazine. Hoxie's call was the most radical yet, but it came as the worst of the fires of 1910 broke out.⁶⁹

The light burning controversy provided a focus for Forest Service goals. The agency was devastated both by the fires of 1910 and by the dismissal of Pinchot, and it needed a new focus. Light burning represented a collection of practices that were the opposite of Pinchot's vision of systematic, scientific national management of resources. Even worse from the Forest Service's perspective, the hated Ballinger had advocated light burning. The Forest Service revamped itself as a fire-fighting agency, its commitment to suppression and its contempt for light burning complete. Despite some efforts by Pinchot's successor, Henry Graves, to experiment with light burning, the Forest Service focused its newly prodigious fire management expertise against the idea of light burning.⁷⁰

As the era of military management of the national parks ended in 1914, the core issues that defined national park fire management and indeed federal fire management in general were clear. In any major fire situation, the need to quickly act overrode all other considerations. Park managers could neither afford to wait nor to go through bureaucratic channels. Managers recognized that only prompt action offered even the remote chance of holding off disaster. The lack of resources remained dramatic. Episodic fire forced small governmental units such as national parks to look to larger entities such as departments or Congress for assistance. An inability to cope with a big fire or a big-fire year often obliterated the incremental improvements of a decade or more. Creating infrastructure - roads, trails, lookouts, patrols, fire brigades - and funding had been a paramount response that the Army provided. A civilian agency that replaced it would have to invent and duplicate it.

In a more philosophical vein, the controversy over a correct approach had begun to form. Suppression, the Army and ultimately the federal strategy, was juxtaposed against controlled burning. The confusion over the role of fire in the Big Trees had become a theme that remained in place for the subsequent half-century. Preservation and the rise of conservation created a dissonance in vision between elites throughout the country and the ordinary people who made a living from western land. Two value systems that presented diametrically opposed visions of the West grappled over how to best address fire.

After 1910, a series of changes in conservation culture created a powerful impetus for the creation of an agency to manage the national parks. The proliferation of park areas

⁶⁸ Pyne, *Fire in America*, 100-03.

⁶⁹ Pyne, *Fire in America*, 104; G. L. Hoxie, "How Fire Helps Forestry," *Sunset* August 1910, 145-51.

⁷⁰ Pyne, *Fire in America*, 104-05.

after the passage of the Antiquities Act played a significant role in the process, as did the struggle over Hetch-Hetchy and the construction of a dam inside the boundaries of Yosemite National Park. Military reluctance to continue in the role of national park management, an arrangement terminated by the Secretary of War on May 1, 1914, also increased the obvious need for some kind of system for park management. With war looming in Europe and the U.S. involved in an expensive excursion into Mexico, Secretary of War Lindley Garrison determined that the Department of War would no longer pay for the management of national parks, a responsibility he believed should be paid for from appropriations for public lands rather than the military budget. The nearly \$400,000 per annum from the military budget for national parks seemed to him an “abuse” and he served notice that it would not long continue. Nevertheless, national parks had begun to be seen as reflections of the essence of American nationalism. These factors combined to open the way for the passage of the Act to Establish the National Park Service, which President Woodrow Wilson signed on August 25, 1916.⁷¹

Because of this new law, the final Progressive Era federal land management agency was born. Labeled a “service” as were so many of its peers in that era, the National Park Service was born with a need to establish itself and its position among peer agencies that overlapped with its mission and its constituency. Its primary rival was the Forest Service, and until 1945, the two agencies struggled against one another with a venomous consistency in nearly all endeavors. Such a rivalry reflected both the parallels and the differences between the two agencies. Very often, they offered different plans and programs for the same tracts of land. Their leaders learned to resent each other, and a tenor of distaste often pervaded interagency interaction through World War II.

With such a relationship, it seems surprising that the National Park Service would accept Forest Service leadership in any area, but when it came to fire, the Forest Service led. After 1910, the Forest Service invested significant resources in fire suppression, creating a culture that became the model for federal fire response. It embraced the military ideal of suppression, shaped in the national parks. Once the military withdrew from the parks, there was no other body of federal workpower handy. No matter how National Park Service leaders felt about the Forest Service, they had nowhere else to turn for information, technology, and resources to fight fire. The degree of danger posed by fire trumped all other concerns, providing an early model of interagency cooperation. At the establishment of the National Park Service, the Army-based system of firefighting was crumbling and the new agency faced a monumental task. Not only did it have to build an infrastructure for the park system, it also had to fight endemic fire and resist episodic colossal fire.

⁷¹ Secretary of War to Secretary of the Interior, May 1, 1914, NARA, RG 79.2.1, Records of Office of Secretary of the Interior Relating to National Parks, Box 89; Robert Shankland, *Steve Mather of the National Parks* (New York, Alfred A. Knopf, 1953), 104-13.

Chapter Two:

The Development of a Fire Management Structure

The founding of the National Park Service in August 1916 heralded a new era for both the national parks and national monuments. While Congress had established the initial national parks – Yellowstone, Yosemite, General Grant, and Sequoia – with specific objectives in mind, the passage of “An Act for the Preservation of American Antiquities,” known as the Antiquities Act of 1906, transformed the proclamation process. It allowed the president to establish national monuments from the public domain with the stroke of a pen. The Act placed few restrictions on what kinds of sites could be included in the monument category and neglected to provide resources for administering the new areas. The result was a numerical explosion in park areas after 1906, complicated by the remarkable diversity of the new areas preserved. Not only did the park system contain spectacular and expansive natural areas like the first national parks, it now included archaeological areas, natural curiosities such as the petrified forest of Arizona and diverse properties that held countless natural and cultural treasures.⁷²

The array of park areas posed an important challenge for Stephen T. Mather, the businessman turned civic exemplar who took the reins of the National Park Service at its birth. Born July 4, 1867, Mather was raised in California during an exciting era. He matriculated from the University of California in Berkeley in 1887, a devoted adherent of the fraternity Sigma Chi and among the many in the era who inhaled the heady fumes of public service that had begun to entice the privileged classes. Mather first worked as a journalist under the storied Charles A. Dana at the *New York Sun*, leaving the newspaper to seek his fortune in the development of American borax. He took charge of promotion for borax king Francis Marion Smith, creating the Twenty-Mule-Team brand and making a name for himself in the nascent public relations and advertising community. Mather had a knack for publicity and for keeping a product in the national eye. Following a nervous breakdown that briefly institutionalized him in 1903, Mather left Smith’s empire to join an old friend in a new borax mining endeavor. Eleven years later, he had become sufficiently wealthy to retire and pursue his other passion: public service.⁷³

Even before he became successful in public relations, Mather had been known as someone with a strong desire to accomplish civic goals. An inveterate joiner, he belonged to nearly every major civic, social, and charitable organization in every city he inhabited. His fraternity remained important to him all his life and expanded to a range of other activities. Mather seemed the classic good citizen; he was involved in so many civic activities that it was hard to find an organization of any significance to which he did not

⁷² Hal K. Rothman, *Preserving Different Pasts: The American National Monuments* (Urbana: University of Illinois Press, 1989); Alfred Runte, *National Parks: The American Experience* 2d ed. (Lincoln: University of Nebraska Press, 1987); “An Act for the Preservation of American Antiquities,” 16 USC 431-433, June 8, 1906.

⁷³ Robert Shankland, *Steve Mather of the National Parks* (New York: Alfred A. Knopf, 1970), 1-41.

belong. In love with California and among the state's greatest cheerleaders in the early twentieth century, Mather connected especially to the outdoors, so remarkable in his native state. This fascination drew him to the national parks.

Mather's involvement with the national parks began with an apocryphal story that illustrated much about the cozy nature of the American ruling class at the start of the twentieth century. One of Mather's college classmates, Sidney Mezes, advised President Woodrow Wilson, leading to the appointment of a coterie of Californians – and indeed University of California graduates – to high posts during Wilson's presidency. One of them, Franklin K. Lane, who had been at Berkeley at the same time as Mather, became Secretary of the Interior. Acquainted with the new secretary, Mather wrote him a scathing letter after a visit to the national parks. Lane purportedly responded, "Dear Steve, if you don't like the way the national parks are being run, come on down to Washington and run them yourself." Mather in fact accepted an offer from Lane, beginning at the Department of the Interior in 1915 as a special assistant with national parks as the primary part of his portfolio.⁷⁴

Eighteen months later, Wilson appointed Mather the first director of the new National Park Service. Mather had come to see American nature as the extraordinary characteristic of the nation. Leading the National Park Service offered him a way to illustrate the importance not only of the physical continent, but of the principles of Bull Moose Republicanism that he had embraced in the 1912 election season. By 1916, Mather was a dedicated Progressive, among the many who believed that government could and should provide for the common good in the United States.

The reality he encountered quickly made hash out of the idealism he brought with him. Mather inherited a complicated situation. Little direct management of the national parks had taken place since the Army renounced its commitment to the task in 1914. Mather had a very limited staff in the nation's capital and few people in the field. Nor did he have a plethora of resources available to him. Chosen because he had an extraordinary way with people, voluminous connections, access to resources, and unmatched dedication, he faced a task equal to his prodigious skills.

For all his marvelous attributes, Mather was not a scientist, and fire management was very low on the Service's initial list of priorities. In part, this stemmed from the minimal role fire played in the national parks, but the chief reason for Mather's lack of interest was the array of issues that faced the new agency. Mather was a Progressive to the core and he reflected its values, which included the concept that actions such as flood control, predator removal, and fire management were all difficult responsibilities best left to specialists. Mather had to sell a new idea to Congress, arrange for funding for park management, foster the creation of travel networks so he could build a national constituency for the National Park Service, administer cranky and sometimes tendentious congressional representatives and their local friends, and otherwise establish his founding agency as a player in the federal land management bureaucracy.

The fires of 1910 had begun to fade in memory, and when Mather looked across the federal bureaucracy, he saw the post-Gifford Pinchot Forest Service actively embracing fire suppression as a core agency mission. Pinchot's successor, Henry Graves, considered fire protection to be 90 percent of his agency's mission. Pulled by his fledgling agency's many needs, Mather likely never considered any kind of proactive fire

⁷⁴ Shankland, *Steve Mather of the National Parks*, 7, 53-54; Runte, *National Parks*, 109-110.

management regime. His official correspondence shows evidence only of reaction to crisis. Despite the incipient rivalry between the Forest Service and the National Park Service, Mather was content to leave the difficult obligation of firefighting to the Forest Service.⁷⁵

Even that agency was only beginning to learn about the enormous challenge it had chosen to make its own. The science of fire management remained in its infancy, and the Forest Service recognized that it could do little about major fires. The Big Blowup of 1910 forever shaped the Forest Service's vision of fire. The inadequacy of existing fire strategies and the inability to genuinely impact major fires struck hard at the core of the sense of duty and worth that early foresters held. When they looked around, they could see real reasons for the agency's weakness when faced with major fires. The lack of technology for transporting vehicles and pumping water, the vast array of federal open space in the West, and the incredible need for dollars and labor to make any kind of a dent in a major fire simply was beyond the reach of any federal agency throughout the 1920s. To its credit, the Forest Service thought long and hard about fire. It continued to experiment with light-burning and allowing some natural fires to burn into the 1920s but became primarily a fire-fighting agency as it built the disasters of 1910 into its creation myth.⁷⁶ In contrast, the early Park Service invested much less of its intellectual energy and fiscal resources in fire. Not a single staff member had fire control or management in their job description.

The nascent Park Service made early tactical mistakes. Its efforts to attract the public had the adverse affect of increasing the risk of fire. Since Yellowstone in 1886, anyone who managed a national park area recognized that people caused most of the fires that required an organized response. Under Mather, the Service's goal was to attract visitors, often as many people as could arrive by the conveyances of the day. NPS efforts were devoted to ensuring that people had access to exciting natural and cultural sites, were comfortable in the parks, and brought home souvenirs that memorialized their stay. Abundant visitors were the focus. In contrast, the Forest Service was prepared to deny access to its lands as a way of controlling people and with them, the fires that agency so dreaded. As Mather built a constituency for the national parks, he inadvertently encouraged precisely the conditions that led to fires. People came to the parks in greater numbers and visited more places inside their boundaries; among the countless other ways they had an impact on parks, they made campfires and tossed aside cigarettes. Fires outside the backcountry grew in direct proportion to the increase in visitation but the Washington office of the National Park Service looked past the issue.⁷⁷

⁷⁵ Samuel P. Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1880-1920* (Cambridge: Harvard University Press, 1959), 1-5; Stephen J. Pyne, *Fire in America: A Cultural History of Rural and Wildland Fire in the United States* (Princeton: Princeton University Press, 1982), 295-96; Mather's official files in NARA RG 79.3.2 for this period show no mention of fire.

⁷⁶ Pyne, *Fire in America*, 295-97; Hal K. Rothman, ed., "I'll Never Fight Fire With My Bare Hands Again": *Recollections of the First Forest Rangers of the Inland Northwest* (Lawrence: University Press of Kansas, 1994), 1-16, 110-36; Harold K. Steen, *The U.S. Forest Service: A History* (Seattle: University of Washington Press, 1976), 37-59.

⁷⁷ Pyne, *Fire in America*, 296-97; David Carle, *Burning Questions: America's Fight with Nature's Fire* (Westport, CT: Praeger, 2002), 11-26; Runte, *National Parks*, 102-04; Shankland, *Steve Mather of the National Parks*, 92-99, 133-42.

At the same time, individual park managers found themselves responding to fire with whatever means were available to them. Especially in the Sierra Nevada and in the Northern Rockies, each summer brought fires that necessitated a response. Problems with communication, transportation, and the inevitable lack of resources placed park superintendents alone in the agency in their battles against fire. They turned to local residents and other federal agencies in their immediate vicinity because these were neighbors with whom they shared problems. In this respect, individual National Park Service units achieved a level of autonomy that they were not generally permitted in more mundane affairs.

As a result, fire remained a local issue for the first decade of the National Park Service's existence. Washington expected individual parks to deal with fires that occurred inside their boundaries or in their immediate vicinity. Superintendents reported fires and how they dealt with them, but underscoring any communication was the stark reality that they addressed fire only with the resources they had on hand. As a result, most developed strategies to offset the lack of fire fighters and dollars. Superintendents cultivated local residents and worked with area Forest Service rangers to develop response systems. In most cases, the response was positive. Everyone recognized that survival at the edges required interdependence. Fire demanded cooperation. In real fires, only full-fledged cooperation provided a chance of retarding the destructive progress of a blaze.

For most of the national parks, the 1916 founding of the National Park Service had done little to change fire management realities, and absent the soldiers who shouldered so much of the fire-fighting burden, the new agency was forced to make do. The exigencies of World War I contributed to this situation as early budgets were limited, but even after the end of combat in 1918, the resources available to the Service did not grow in proportion to its obligations. New parks and larger visitor numbers spread limited resources ever more sparsely across the national park landscape. This complicated every mandate and goal the new agency possessed, for the National Park Service effectively was forced to do more each year without a substantive increase in available resources.⁷⁸

The NPS's fiscal circumstances and a lack of general understanding of the demands of fire and its implications for the park system combined to keep fire protection on the periphery of the agency's thinking. Nor did the Service make a special effort to change its fire management situation. Fire protection and preparation remained an afterthought. As a result, National Park Service standards did not measure up to the protection the Army once provided. Myriad reasons contributed to this shortcoming. Unlike the Forest Service, which received congressional authorization in May 1908 to overspend its budget on fire fighting, the Service had to fight fire from its general appropriation. There were no specific earmarks in advance of fires. Financial conditions remained abysmal. No individual park had a fire budget or staff member specifically devoted to fire management in any form. Personnel was spread thin across many responsibilities, and few in the Service, save Colonel John R. White, who joined the agency as a ranger in Hawaii and became superintendent at Sequoia and General Grant

⁷⁸ Runte, *National Parks*.

national parks for more than two decades, had any experience with fire or inclination to think about it.⁷⁹

The federal appropriations process did not yield positive results for fire protection in the park system. The war years were hard, although Mather was able to transcend many of the problems that befell other federal agencies. His relationships with members of Congress and his ties to influential people across the country mitigated the impact of war on his fledgling agency. Although Albright recalled the “agony of appropriations” as an annual spring rite, the agency did as well as could be expected. In spring 1918, the peak of American involvement in Europe and with no end to combat yet in sight, the Park Service received \$754,195 in a lump sum annual appropriation. In his memoirs, Albright complained that the budget provided no special funds for new roads and only a little money to improve El Portal Road in Yosemite. “For fire fighting, not a penny was allocated,” he remembered many years later.⁸⁰

This situation reflected not only Congress’ parsimony, but the agency’s hierarchy of requests as well. The few remaining papers that address the National Park Service’s budget requests show no evidence of a specific request for fire fighting. Mather primarily focused on access; he thought about roads and contracts with visitor service providers, leaving more direct resource management questions to subordinates. In the 1910s and 1920s, the Service still struggled with the need to expand. Its energy and effort was directed toward land acquisition ahead of protection of lands already in the national park system. Without resources to support on-the-ground activities, much of the work that assisted in fire protection –clearing and brush removal in particular – was limited to local efforts. The small size of the Service and its vast responsibilities contributed to a distinct division in its operations. Superintendents acquired de facto autonomy, but without resources at their disposal, they faced difficulty in giving it meaning. In theory, park superintendents had considerable discretion. The small fixed appropriations for most translated into limited action.⁸¹

The dominant technological advance of the age posed another kind of problem. At the founding of the National Park Service, railroads were critical to the Service’s formulation of its future. Rails would bring the visitors who elected the officials who funded the park system and their ability to reach national parks topped the early National Park Service’s list of goals. Major national parks such as Glacier and Yellowstone were well served by the steel rails either within the parks or near their boundaries. Yet trains and the sparks they threw off remained a prominent cause of fire. In some situations, such as the Inland Northwest during a dry summer, a railroad as much as fifty miles away could represent a serious threat to a park. The rapid spread of fire made rails a catalytic factor. Fires accompanied rail lines with a certainty that was frightening, and park superintendents watched nearby rails with trepidation.⁸²

⁷⁹ Carle, *Burning Questions*, 236-38; Lary M. Dilsaver and William C. Tweed, *Challenge of the Big Trees: A Resource History of Sequoia and Kings Canyon National Parks* (Three Rivers, CA: Sequoia Natural History Association, 1990), 151-69.

⁸⁰ Horace M. Albright and Marian Albright Schenck, *Creating the National Park Service: The Missing Years* (Norman: University of Oklahoma Press, 1999), 276-79.

⁸¹ Confidential Files of Horace Albright, arranged by subject, 1916-1933, NARA, RG 79.3.2; Joseph W. Ernst, *Worthwhile Places: Correspondence of John D. Rockefeller, Jr., and Horace M. Albright* (New York: The Rockefeller University, 1991), 3-15; 24-28.

⁸² Rothman, “I’ll Never Fight Fires with My Bare Hands Again,” 103-36.

Parks faced other kinds of fires, natural and human-induced. When lightning ignited a powerful fire in a remote area, it required less reaction from the National Park Service. Such fires simply burned until they consumed all the available fuel or were extinguished by precipitation or blocked by geographical barriers. When fires were closer to people, often because carelessness had been their cause, parks relied on fear of the fire's spread to catalyze organized response. Everyone in the fire's path tended to pitch in to slow, divert, contain, or suppress fire. With limited tools and fewer resources available to counter fire, any blaze had the ability to leap out of control and damage everyone's property. In the late 1910s and early 1920s, national park areas did the best they could when they faced fire. When fire spread and outstripped the sorely limited resources, the National Park Service called on the Forest Service for whatever assistance that agency could offer.⁸³

The National Park Service failed to develop an overarching fire policy of any kind, and as a result, the response to fire varied from park to park. Those with considerable timber and significant histories of fire devoted greater resources to thinking about fire though most lacked the money to make a substantial investment in any kind of prevention program. But most park superintendents and custodians addressed fire as if it were an unexpected event instead of an endemic condition, reflecting the reality that most managers did not plan for any kind of annual fire management. Without a line item budget for fire, any resources allocated for suppression came from those initially allocated to other activities. NPS officials in Washington provided little guidance or structure. Early park managers recognized that no matter what they did, if fire reached the level where it demanded significant reallocation of resources, no manager had to do more than make a token effort to slow a blaze. The most common agency response to a major fire in those years was to look to the skies and hope for rain.⁸⁴

As long as most park fires were small and local, this haphazard management system proved adequate. As soon as a fire got loose, it exposed the limited nature of existing practice and the philosophy of benign neglect that underpinned park fire management. The buzz that Mather and his associates created – inspired by a combination of promotional publications, speeches, and the aggressive posture of Congress in proclaiming new park areas – made insufficient action an even graver failing. If the agency had gaps in its practice in its first few years, its inability to respond to fire held a prominent place on its lists of shortcomings.

From August 1916 until the summer of 1919, the National Park Service was simply fortunate: no major blazes took place inside national park areas. The small fires in the parks were handled by zealous application of every available resource. Mather was able to promote the parks, build support for them, deliver influential people to a range of

⁸³ Pyne, *Fire In America*, 353-56; Carle, *Burning Questions*, 238; Harold K. Steen, *The United States Forest Service: A History* (Seattle: University of Washington Press, 1976), 129-31, 176-79.

⁸⁴ A thorough review of agency files in NARA, RG 79.7 reveals no examples of proactive fire planning. Albright's two memoirs, Albright and Cahn, *The Birth of the National Park Service*, and Albright and Schenck, *Creating the National Park Service*, contain a total of five references to fire, all but one of which are comment on the impact or aftermath of specific fires. No correspondence of Mather in the NARA, RG 79.3.2 or 79.7 suggests any proactive approach to fire. The small collection of his papers at the Bancroft Library at the University of California, Berkeley, only peripherally address the early years of the NPS. Although it is difficult to prove a negative, the author is quite convinced that the National Park Service had no comprehensive fire strategy in its early years.

areas, and otherwise further the objectives he and Secretary Lane established without ever facing the reality that hounded the era's Forest Service managers: a fire would expose both a lack of control of the physical world and the elaborate fiction of protection from which federal agencies derived their significance. For three years, the National Park Service only recognized fire when it could be melded with other functions. Yellowstone, the crown jewel of the system, served as the example. In 1917, the Service maintained miles of fire trails in the park for horseback and auto tours. Clearing the roads served a dual purpose: it allowed the transportation of men and equipment in the event of a fire and more importantly, it permitted visitors to see the park's most scenic parts.⁸⁵

In 1919, the first indication that the National Park Service strategy would not work much longer became evident. By then, Glacier National Park had developed a cumulative fire problem. Each year since its establishment in 1910, the northwest Montana park faced fires, sometimes large ones. The park had a complicated history that included the exclusion of the Blackfeet people and the elimination of their usufruct rights, their legal right to use lands for hunting and ceremonial purposes, that they ceded to the government for a national park. Glacier was full of timber and people, some still angry at its creation. The influx of timber companies, which began almost immediately after the 1910 fires, added another potential fire source. By the end of the decade, northern Montana was full of timber operations small and large, and many had become mechanized. Railroad lines that traversed the region, some large such as the Burlington Northern, others simple log-hauling roads, increased the possibility of incendiary incidents. Sparks from an engine or any of the railroads could ignite dry brush, posing an ongoing and widening threat.⁸⁶

As activity increased, the number of acres of timber lost to fire rose each year, as did the cost of suppression. In 1917, fire consumed more than 7,000 acres of park timber and fire-fighting costs totaled \$11,968. On July 23, 1917, sparks from a Great Northern Railway engine ignited blazes near Belton Hills and Rock Hill in the Flathead National Forest. The fire spread into Glacier National Park, causing one-tenth of the damage the park sustained that summer. The park paid for its fire damage out of its budget, later providing evidence in court against the railroad when the federal government sued to recover costs of fighting the fire. Two years later, more than 50,760 acres of timber burned, at a cost of \$46,000 from the park budget. Most of the fires resulted from railroad sparks even though the Great Northern Railway aggressively cooperated to minimize the threat. In addition, Glacier Superintendent Walter W. Payne claimed depreciation on park equipment of more than \$10,000, a result of the fire's destruction of machinery and the locations in which it was stored. In 1920, the cost rose to \$81,849, a sum that exceeded the park budget for the year.⁸⁷ The increase in cost suggested dramatic changes in the patterns of fire in the area that promised only greater trouble.

⁸⁵ Department of the Interior, *Report of the Director of the National Park Service to the Secretary of the Interior, for the fiscal year ended June 30, 1917* (Washington, D.C.: GPO, 1917), 34.

⁸⁶ Superintendent's Annual Report, Glacier National Park, 1911, 7; Superintendent's Annual Report, 1916, 8, NARA, RG 79.7.7 Glacier National Park, Superintendent's Annual Reports, 1910-1983.

⁸⁷ Superintendent's Annual Report, Glacier National Park, 1919, 22; W. W. Payne to The Director, December 30, 1919; George Goodwin to Director, September 9, 1920, NARA, RG 79.7, Glacier National Park, , Box 22; Mark D. Spence, *Dispossessing the Wilderness: Indian Removal and the Making of the National Parks* (New York: Oxford University Press, 1999), 88-95.

Fire posed the same threat it had in the late nineteenth century, exacerbated by increased population and better technology. Without development of a comprehensive agency structure, response remained localized. During the years the Army guarded the national parks, carelessness caused most human-induced fires; major fires often resulted from the sparks caused by railroad wheels. By the late 1910s, a prevalence of railroad engines and even a few automobiles added another contributing cause. Park responses stayed much the same. Labor remained scarce and parks often had to import day labor from nearby communities to fight fires. The park almost always had to bear the cost, with the general budget typically the source. Fire fighting took up “the greater portion of the energies of the working force as well as the funds available for improvement work during the past summer,” Superintendent Payne wrote in Glacier’s 1919 annual report in a typical example of sentiment.⁸⁸ Superintendents looked at their predicament and the absence of a budget and recognized that creativity was essential if they were to combat the growing problem of fire with any effectiveness.

Technological solutions were at the top of the National Park Service’s list. Compared to the slim chance of additional appropriations for personnel, new technology seemed a better alternative to park superintendents. By the early twentieth century, some rudimentary fire equipment had become available. In the early 1920s, the famous Pulaski hand tool, the vaunted combination of a mattock and an axe, remained the standard fire-fighting tool, but a revolution that relied on more complicated pumping equipment already had begun in earnest. The Forest Service tested pumping equipment – developed for urban fire fighting – in the field, and Canadian timber companies developed nominally “portable” pumps. Western parks in Canada adopted the technology and it soon crossed the border to Glacier National Park. The machines pumped water from an available water source – a stream, river, or lake – and horses pulled them from place to place. To the National Park Service, this was an important advance and officials eagerly pursued the idea. Superintendent Payne at Glacier enthusiastically endorsed the equipment. Properly applied, he believed, the pump would diminish the impact of campfires that got out of control.⁸⁹

The technology had severe limits; horse-pulled engines required more than simple storage. The utility of the machine depended on a corral full of horses and nearby pasture, close enough to quickly round up the animals when the call came, but large enough to allow them to graze and run to stay healthy. Without the animals in the early automotive era, crews could not bring the equipment to a fire in a timely fashion. Payne asserted that even these rudimentary pumping engines were an improvement over anything the park possessed. He hoped the Service would purchase enough to supply a number to Glacier National Park. The NPS did not provide equipment in 1920, but planned to seek an appropriation the following fiscal year.⁹⁰

The National Park Service found that fire fighting demanded cooperation with nearby national forests. The Forest Service had long promoted such cooperation, encouraging private timber protective associations in the Northern Rockies and supporting other ways to assure a strong response to fires. Other federal representatives,

⁸⁸ Superintendent’s Annual Report, Glacier National Park, 1919, 22; Superintendent’s Annual Report, Glacier National Park, 1920, 16, Glacier National Park Archives, Glacier National Park, MT.

⁸⁹ W. W. Payne to Director, May 17, 1920, NARA, RG 79.7 Glacier National Park, Box 22.

⁹⁰ Ibid.

especially the area's grizzled foresters, contributed resources and expertise every time a major fire started. This powerful presence helped negate the sometimes half-hearted enthusiasm of local residents. Park superintendents recognized the interrelated nature of fire fighting and followed the Forest Service lead, even as the two agencies grappled for control of federal land management. Superintendents complemented their peers at the Flathead, Blackfeet, and Lewis and Clark National Forests.⁹¹ The Service joined an existing model of cooperation.

After a significant fire at Glacier in 1921, the National Park Service did as much as it could to develop a fire protection system there. Consistent recommendations emanated from the park, asking for more rangers for patrols in the summer, advocating construction of fire patrol and boundary trails, and employing fire guards in especially bad years. By 1922, lookout cabins were on the priority list, as was a cross-park telephone line to alert people in case of fire. In 1923, Glacier built telephone lines to Huckleberry Mountain, Riverview Mountain, and Indian Ridge – now called Numa Ridge – and established lookouts. In 1925, the park purchased twelve pumps, its first genuine capital outlay for fire protection, and the new equipment proved an effective response to the ongoing fire problem.⁹²

Fire remained an ongoing problem throughout the national parks, a combination of individual behavior, lack of resources, and lack of statutory authority to enforce standards limited the response of the National Park Service. Even in the early 1920s, the Service lacked an appropriation to fight fire. Each year, at the end of the fire season, national parks presented their bills for fire fighting to the Washington office, which sought special congressional appropriations to restore much needed operating dollars to the parks. This cumbersome system resulted from the fact that Congress had yet to contemplate a formal structure for managing fire on federal lands.⁹³

Only in 1922 did the National Park Service receive its first direct appropriation for fire fighting, a \$25,000 lump sum for the entire system. The Service's budget had remained small because of the errant presumption that the parks would pay for themselves that existed since the founding of Yellowstone. This assumption made asking for a base budget, much less an additional appropriation, a difficult task. The small sum of \$25,000 seemed an inconsequential amount after the spate of recent fires, but it paralleled what had become a congressional pattern of after-the-fact deficiency spending to solve specific problems in parks. In 1920 alone, when the entire NPS operating budget was \$907,070, Congress appropriated \$25,000 for fire prevention above Yellowstone's base budget of \$250,000. The same year, Glacier National Park received \$62,000 in deficiency spending above its regular allotment of \$85,000. Even as the NPS operating budget grew to \$3,027,657 in 1925, the \$25,000 allotment was a congressional stopgap, a way to appear to address a growing problem and to eliminate the consistent parade of

⁹¹ Superintendent's Annual Report, Glacier National Park, 1918, 35; Superintendent's Annual Report, Glacier National Park, 1919, 22; Superintendent's Annual Report, Glacier National Park, 1923, 8, Glacier National Park Archives, Glacier National Park, MT; Hal K. Rothman, "'A Regular Ding-Dong Fight': Agency Culture and Evolution in the Park Service-Forest Service Dispute, 1916-1937," *Western Historical Quarterly* 20 2 (May 1989), 141-61.

⁹² Superintendent's Annual Report, Glacier National Park, 1921, 21; Superintendent's Annual Report, Glacier National Park, 1923, 15; Superintendent's Annual Report, Glacier National Park, 1925, 11, Glacier National Park Archives, Glacier National Park, MT.

⁹³ Pyne, *Fire In America*, 266-72.

deficiency spending requests. The limits on it were clear: the money could only be used to fight fire, not to engage in fire prevention strategies, practices, and tactics. Inadequate even in a year with few fires, the sum represented an important first step.⁹⁴

The \$25,000 sum became the standard allocation during the rest of the first half of the 1920s, an annual addition to the NPS's small budget that allowed the Service to mitigate at least some of the impact of fire. In most years, it did not cover its total expenditures for fire fighting, and large fires still necessitated specific after-the-fact legislation to recoup costs. However, a line-item appropriation in the annual budget represented a different way of thinking about the impact of fire on the park system.⁹⁵

The small national appropriation assured that as late as the mid-1920s, the National Park Service spent dollars from park appropriations to fight fires. Fire remained a local responsibility, fought with the existing budget and whatever workpower a superintendent could cajole from the surrounding area. NPS rangers often fought fires outside park boundaries, not only to keep fires away from parks, but also to create a community of interest that allowed park officials access to non-NPS firefighters when a park needed them for a fire within its borders. The agency also paid cash for outside fire fighters, but finding resources was a difficult process that invariably drained the pool of money for other park activities. Maintenance on roads and trails halted when blazes demanded workers, and the dollars allocated for such activities disappeared into the smoke of any major fire.⁹⁶

The lack of national resources left an inordinate amount of discretionary decision-making at the local level. In general, the early National Park Service was a hierarchical organization. Communications between superintendents and the NPS's upper echelon often resulted in attempts to impose national-level solutions on local problems. Unlike the Forest Service, which encouraged decentralized authority and local adaptations, senior NPS officials favored policy emanating from its core and implemented in individual parks. But without financial resources to support these directives, superintendents exercised much greater leeway than Washington cared to admit. Responding to fires, this deviation from Service norms was even more pronounced.⁹⁷

The lack of resources devoted to fire complicated an already difficult situation. In the 1920s, the Service had already divided fire management into two competing models. The first, fire exclusion, required suppression; the second, fire use, involved light burning. In choosing between these, the National Park Service faced an important dilemma. The Service could look to its own heritage, with the Army, or to the Forest

⁹⁴ *Fourth Annual Report of the National Park Service, 1920* (Washington, D.C.: Government Printing Office, 1920), 278-301; *Report of the Director of the National Park Service for the Fiscal Year ended June 30, 1927* (Washington: Government Printing Office, 1928), 104-17; Barry Mackintosh, *Visitor Fees in the National Park System: A Legislative and Administrative History* (Washington, D.C.: National Park Service, 1983), 2-10; John Ise, *Our National Park Policy: A Critical History* (Baltimore: Johns Hopkins University Press, 1961), 619-24.

⁹⁵ Arno B. Cammerer to Secretary of the Interior, September 15, 1922; Arno B. Cammerer to Secretary of the Interior, June 11, 1924, NARA, RG 79.7., Glacier National Park, Box 23.

⁹⁶ Superintendent's Annual Report, Glacier National Park, 1924, Glacier National Park Archives, Glacier National Park, MT, 8.

⁹⁷ Ronald A. Foresta, *America's National Parks and Their Keepers* (Washington, D.C.: Resources for the Future, 1984), 21-37; Hal K. Rothman, *Preserving Different Pasts: The American National Monuments* (Urbana: University of Illinois Press, 1989), 67-92; Harold K. Steen, *The United States Forest Service: A History* (Seattle: University of Washington Press, 1976), 76-78, 98-99.

Service, which had absorbed and remade the military example. At the local level, some superintendents departed from both models and employed light burning. Under this model, parks managed fire as best they could, choosing practices based on the application of their very limited resources. Officials might selectively let fires burn, as much a result of the lack of funds for firefighting as for any ideological reason.

At the national level, the Park Service naturally leaned toward the Army-Forest Service suppression paradigm. Their only model for such management practices was the military and Forest Service experience in the national parks. The U.S. Army had served as important stewards beginning in 1886 and the military approach to fire-fighting had been the dominant paradigm. In both the California parks and Yellowstone, soldiers formed the backbone of fire-fighting manpower. To the early National Park Service, this policy made considerable sense. Its problem was finding a way to replicate the Army's approach without having the resources of the War Department at its disposal.

Sequoia National Park provided a rare testing ground for alternative ideas about fire. As a species, sequoias offered a natural counter to the idea that suppression was a sound management alternative. The big trees had existed for millions of years and fire was essential to their propagation. When the National Park Service implemented a suppression approach, underbrush no longer burned regularly, increasing the fuel load surrounding the trees. Fires that had once nurtured the sequoias suddenly became capable of damaging them. An important symbol of the national park ideal, the sequoia was peculiarly vulnerable to management efforts that did not take the species' ecological context into account. From the first moment the NPS stopped a fire in the sequoias, well-intentioned Service officials inadvertently endangered one of the symbols they and the American public most cherished.

Superintendent Col. John R. White of Sequoia National Park became the Service's most vocal proponent of light-burning. White watched the light-burning controversy with interest throughout the 1920s, engaging in a vigorous debate with Horace Albright, himself an unabashed proponent of suppression. The two squared off with vigor, both pointing to their experiences as justification for their perspective. White found himself with what was in essence an unfunded mandate, to which a little bit of burning in a controlled way was an effective and inexpensive solution. The powerful Albright was both a product of the age in which fire was an enemy and a canny bureaucrat who recognized the need to toe the line on policy if he wanted to secure some of the benefits for his agency. Raised in the California desert, Albright was as hard as the climate that produced him. He was not one to brook dissent on such an important topic, and with his vast influence and reputation for punishing opponents, much of the Service rallied around him for political as well as ideological reasons. Charles Kraebel at Glacier National Park weighed in, calling light-burning an "ogre," after Albright himself called the practice "unsound and fraught with an enormous amount of danger." Isolated, White persisted, asking for a new look at the idea. He even tried a number of controlled burns at a time when suppression was the rule in fighting park and forest fires.⁹⁸

White became an advocate of controlled burning, applying it within Sequoia whenever possible. He watched the aftermath of the disastrous California fires of 1924 –

⁹⁸ Arno B. Cammerer to Colonel White, September 8, 1924; Horace M. Albright to Sir, September 15, 1924; John R. White to Arno B. Cammerer, September 20, 1924, Fire Records, 1904-1930 Man – U – Box 275, Folder 2, Sequoia National Park.

which largely missed the national parks – and recognized the flaws in the National Park Service’s suppression strategy. White complained in 1926 that suppression practices contributed to the worst fire in the region’s history, a 120-square mile blaze that destroyed ten square miles of park timber that year. The “forest floor is thick laid with a mass of combustible pine needles, branches, logs, and snags,” he insisted in his 1926 annual report, “which makes a fire almost impossible to control.” White devised his own remedies, national policies to the contrary. In at least one instance, White ordered his men to burn an area – much to their consternation – and with a staff of rangers, the first intentionally ignited controlled burn in the park system was a success.⁹⁹

White held a minority perspective. The institutional power of the Forest Service and its role as the lead agency in firefighting gave it primacy, subordinating all other points of view to suppression. State-level decisions confirmed this pattern. In 1923, a California government agency ruled against light-burning. The 1924 Clark-McNary Act, which allowed federal assistance and grants of aid for fighting forest fire, effectively turned fire protection into the basis for cooperative forestry and federal-state relations, and light burning disappeared from discussions about fire management. Chief Forester William Greeley regarded the Clark-McNary act as his finest moment, for it cemented the Forest Service’s leadership in the field, gave that agency control of considerable resources for forest and fire management, and assured some measure of federal control over what went on in U.S. forests. The Act provided rapid results. In 1928, the Forest Service received \$1 million for the prevention and suppression of forest fires.¹⁰⁰

Throughout the 1920s, the National Park Service worked to standardize management, creating not only an administrative infrastructure but independent specialized divisions as well. The Washington, D.C., headquarters grew in strength, with Albright as its chief legislative liaison even as he served as superintendent of Yellowstone. Without an intermediate layer of management, superintendents communicated directly with the nation’s capital, bringing local problems squarely into the view of Service leadership. The NPS’s only field office, in San Francisco, handled facilities development, adding the beginnings of what became interpretation and resource management in the early 1920s. Californians were prominent in development of interpretation and resource management. The appointment of Ansel F. Hall, another University of California graduate, as the Park Service’s first chief naturalist in 1923, began a process of promoting innovative park-level staff to leadership positions. Naturalists often were assigned responsibility for fire management at the park level, and Hall was set up to be the counterpoint to the well respected White.¹⁰¹

By the mid-1920s, the National Park Service’s response to fire was pulled between policy and operational realities. The Service had committed to the ideal of cooperation inspired by the Clark-McNary Act, in the process ceding the dominant

⁹⁹ Superintendent’s Annual Report, Sequoia National Park, 1926, 10.

¹⁰⁰ Act of June 7, 1924 PL 68-270, Ch 348, 43 Stat 653; Laws and Legislation, 1924: Clarke-McNary Act, U.S. Forest Service Headquarters Collection, Forest History Society, Durham N.C.; William G. Robbins, *A History of National, State, and Private Cooperation* (Lincoln: University of Nebraska Press, 1985), 85-104; Pyne, *Fire in America*, 353-57.

¹⁰¹ Shankland, *Steve Mather of the National Parks*, 262; Donald W. Swain, *Wilderness Defender: Horace M. Albright and American Conservation* (Chicago: University of Chicago Press, 1970); William C. Winkler and Merrie H. Winkler, “Ansel F. Hall, 1894-1962,” in William Sontag, ed., *National Park Service: The First 75 Years* (New York: Eastern National Park and Monument Association, 1991), 21-22.

position in fire suppression that national parks had held under the Army to the Forest Service in return for access to that agency's increasing skill and the vast resources that stemmed in no small part from the Clark-McNary Act. Albright's power and standing guaranteed that the National Park Service would choose his view over White's. It was one thing to swear loyalty to the principle of suppression, joining the family of federal agencies and state governments committed to following the Forest Service's lead. Implementing such a policy on the ground was a far more complicated task.

Still, individual parks made strong progress in light burning. Under John White, Sequoia National Park implemented a full-fledged fire regime. He directly countered existing National Park Service policy, initiating what amounted to controlled burns on a number of plots and experimenting with the strategic use of fire throughout Sequoia. This served as one model, a direction that made the headquarters leadership more than a little uncomfortable. Not only did it challenge NPS policy, it ran directly against the dominant current in the Forest Service, where the decisions about allocating resources the Service desperately needed were made. White was able to engage in a clear violation of National Park Service policy for two distinct reasons. First, he commanded great respect within the agency, his service dating almost to the founding of the Service; second, he had the good sense to keep the knowledge of his practices within a small circle, many of whom were at least ambivalent about suppression as a goal.

The countervailing force, the place where the NPS followed the Forest Service's pattern, was Glacier National Park, which by 1926 seemed to be prepared to grapple with fire. In the course of the decade, a combination of factors, including funding, equipment, and technology, had changed this park from a place where fire had been a consistent problem to one where the Service had mustered the limited resources it had to fight fire and officials believed they had a plan to successfully battle it. Even the replacement of Superintendent Walter Payne with Charles Kraebel, a veteran of the Forest Service, reflected a new National Park Service aggressiveness about fire. Kraebel promoted himself as knowledgeable about fire, engaging in debate with well-known authors about the efficacy of light burning. A new era seemed ready to dawn, but whatever confidence developed was shattered in August 1926, when the worst fires to hit the Inland Northwest since 1919 began.¹⁰²

By the beginning of August, Glacier National Park already had wrestled with a number of fires. Summer weather conditions mirrored those of 1910, with extended high temperatures, little moisture, and significant winds. Most federal managers were nervous, and the behavior of some local residents worsened an already tense situation. In June, a fire from a logging operation run by George W. Slack of Belton, Montana, spun out of control. To fight it required park pumps and two rangers. In forceful language, Kraebel informed Slack that "the entire responsibility of [the fire] rests with you," that Slack had to provide workers to control of the fire until it was "dead out," and that Slack would be expected to pay the fire-fighting costs. Slack ran a salvage operation within the park on contract and had been negligent in complying with his obligations. The fire seemed one

¹⁰² John R. White to Arno B. Cammerer, September 30, 1924, Fire Records, 1904-1930, Man - U - Box 275, Folder 2, Sequoia National Park; Superintendent's Annual Report, Sequoia National Park, 1925, 4; Charles Kraebel to Arno B. Cammerer, September 3, 1924; Charles Kraebel to The Director, telegram, August 15, 1925, NARA, RG 79.7, Glacier National Park, Box 23.

more consequence of a sloppy operation and in a season with elevated risk of fire, a particularly dangerous one.¹⁰³

By the end of July, fires had created a crisis in park management. Blazes started in five separate locations in Glacier, spreading so rapidly that by August 1, 19,000 acres of timber were burned or in serious danger of burning. Among the sites were fires along Fish Creek, on the North Fork of the Flathead River and on the Blackfeet National Forest, west of the park boundary. The earliest of these originated in the national forest on July 7 and jumped the park boundary five days later. Kraebel responded with the resources at his disposal, but not as vigorously as people in the area had hoped. Some residents expressed their ire. One of them, W.A. Boz, held a personal grudge against Kraebel. Boz's relationship with Montana Senator Thomas J. Walsh, an early nemesis of the Service, earned his complaints a serious hearing. In response, the Department of the Interior dispatched Horace M. Albright, Mather's right-hand man and at the time, superintendent of Yellowstone, to Glacier to take charge of fire fighting inside the park. On August 3, Albright filed his first report from the blaze. He announced the establishment of eight fire camps with a force of 425 men. As always, the adept Albright demonstrated rapid control of a situation that only days earlier seemed almost beyond hope.¹⁰⁴

Even as Albright established the solid administration for which he was known, a new fire started. Slack, the logger who had been reprimanded earlier in the year, continued to operate within Glacier. On July 31, with a high wind blowing, the gasoline tank on one of Slack's trucks exploded, igniting a fire that spread quickly in the high winds. It crossed Fish Creek, and reached Lake McDonald, one of the primary features of the park. Albright feared that it would ruin that scenic section of Glacier although the terrain it contained was "the most difficult [he] had ever seen" for fighting fire.¹⁰⁵

This particular fire devastated the land it burned, much as had the initial fire in the Blackfeet National Forest. It was as "intensely hot," Albright noted, as the one that had started in the national forest. The understory, the combustible material that built up on the ground in the absence of sporadic fire, was particularly thick, mute testimony to the success of localized fire suppression since 1910. "The timber is thick and heavy, and the ground is covered with brush, down timber, and deep humus of pine needles and rotten leaves," Albright observed.¹⁰⁶ Although no one at the time recognized the connection, the Lake McDonald fire graphically illustrated the inherent problem of suppression. Success in fighting all fires thickened the understory and created a more powerful fuel load, guaranteeing a hotter and more destructive fire when an area finally did burn.

Albright recognized the danger of the Lake McDonald fire and mustered all the resources that could be spared. He drafted 100 men from construction crews, moving them to the west side of Lake McDonald on August 5. In the next twenty-four hours, they trenched the fire to the summit of Howe Ridge, blunting its advance. At the same time, high winds – the most powerful that many long-time Montanans recalled ever

¹⁰³ Charles Kraebel to George Slack, June 6, 1926, NARA, RG 79.7, Glacier National Park, Box 23.

¹⁰⁴ Arno B. Cammerer to Stephen T. Mather, July 31, 1926; Department of the Interior, Memorandum for the Files: For Immediate Release, August 3, 1926; Arno B. Cammerer to H. A. Noble, August 3, 1926; Horace M. Albright to The Director, August 4, 1926, NARA, RG 79.7, Glacier National Park, Box 23.

¹⁰⁵ Horace M. Albright to The Director, August 4, 1926; Horace M. Albright to The Director, August 14, 1926, NARA, RG 79.7, Glacier National Park, Box 23.

¹⁰⁶ Horace M. Albright to The Director, August 4, 1926.

experiencing – drove the West Huckleberry fire down the north slope of Apgar Mountain until it merged with another branch of the Lake McDonald fire. The meeting of the two fires, Albright told Mather, “compelled considerable readjustment of our fire fighting organization.” Digging trenches in front of these fires required the redeployment of a number of the men and took almost four days to accomplish. By August 14, Albright felt he had the majority of fires under control. Only a little trenching work remained, he reported, and nearly all the fires were contained. Rain would accomplish the rest.¹⁰⁷

The Glacier fires in 1926 were a disaster for the National Park Service. Not only did more than 50,000 acres of timber burn at a cost of almost \$230,000 even as the NPS employed 3,583 men to battle the blazes, but the Service also found itself on the political defensive. Many elected officials on the northern plains already evinced strong anti-federal government sentiments, a legacy of earlier struggles about federal reservation of land as well as of conflicts with Mather’s agency. Attacked by the powerful Senator Walsh, the fire situation challenged the dependability of its park superintendent, an experienced Forest Service man, and even the adroit Albright. A complicated ecological event landed in a distinctly political context. Worse, the Service had to fight these fires without even the promise of resources. The National Park Service had only \$38,000 in its budget for fire management in the entire system.¹⁰⁸

The gaps in the National Park Service’s fire management system were never more apparent. For years, superintendents had complained of the inadequacy of fire strategy, to little avail. This new fire considerably altered the equation. Even Mather’s most trusted deputy could not keep the situation entirely under control. Service leaders recognized that they faced an adversary with unparalleled ability to disrupt the best plans officials could design. Fires threatened the national parks not only as natural spectacles but challenged the Service’s credentials as a professional organization capable of administering such areas. Unlike political or personal adversaries, fire did not respond to simple mollification, could not be buttonholed in congressional corridors, or programmed according to annual budgets.

From the wreckage of the 1926 fires at Glacier National Park came the desire to create a new National Park Service system to administer fire. When it burned in the summer of 1926, the fire set off a chain reaction that led to the Service’s first fire management system. This second major fire season forced it to rethink its fire strategy. The 1926 fires acted on the NPS as the 1910 fires had on the Forest Service; they galvanized it into a systematic response. While individual parks always had lacked the resources to adequately fight major fires, the 1926 fire season elevated that problem to a national issue, something that the Service could not expect to solve on its own. NPS leaders no longer could simply return fire to park superintendents. They were forced to recognize it as a primary issue for agency-wide policy makers. The fires also highlighted NPS vulnerability not only to political leaders – something the Service well knew after being in existence for a decade – but to local constituencies and the media. These lessons contributed to a more sophisticated response to fire in general.

After a decade in which fire was subsumed in the National Park Service’s systematic programs of constituency building, capital development, and land acquisition,

¹⁰⁷ Ibid.

¹⁰⁸ “Fire History of Glacier National Park (Based on extracts from Glacier National Park Master Plan and other records), NARA, RG 79.7, Glacier National Park, Box 23.

it finally faced fire in cold, hard way: it could not be dealt with as a local episodic problem. Instead, it was a system-wide endemic issue that required leadership at the national level. After 1926, fire management demanded much more than a piecemeal response and the Park Service responded with new approaches.

The National Park Service turned to Chief Naturalist Ansel F. Hall, who took on the role of Chief NPS Forester after the 1926 Glacier fires. The adept Hall had risen quickly in the Service. Hall graduated from the University of California with a degree in forestry in 1917 and served as park naturalist at Yosemite from 1920 until his 1923 promotion to chief naturalist at 29. Even before becoming chief naturalist, he had begun an extraordinary career in institutional development, raising private funds for the Yosemite museum and showing the creative leadership that became the hallmark of his career.¹⁰⁹ The selection of the capable Hall as chief forester illustrated the new importance of fire management to the Service.

Such a designation combined different needs for the National Park Service. Albright had advocated a more specialized NPS management structure, with experts in specific areas of significance. The new approach to fire, the recognition that it was system-wide and endemic, required a general manager on the national level. Still, Hall had many responsibilities in the Service, limiting the amount of time he could devote to fire management. Placing forestry under the naturalist division made sense, but it also subsumed fire management to other activities. Within two years, Hall recognized that fire management was beyond the capability of NPS naturalists. By some accounts, his emphasis on collecting material culture and designing museums helped prompt his recommendation to Mather in 1928 to create a position called “fire-control expert.”¹¹⁰ This job, different from forestry in some ways, reflected not only the growing specialization of the NPS but Hall’s recognition that fire management required a great deal more time and energy than it had received.

The move to find a forestry specialist for the National Park Service accelerated after Sequoia Superintendent White reopened the light burning controversy. In August 1928, in the aftermath of a fire that crossed national forest, national park, and state lands, White wrote the *Los Angeles Times*, congratulating the newspaper for resisting sensational reporting on the impact of the fire on the national park. The state of California suppressed the fire after three weeks, its work complicated by a backfire White and his men set. White trumpeted the instance as a positive example of light burning. At about the same time, an important California timber business, the Red River Lumber Company, announced that it planned to resume light burning.¹¹¹ In an era when superintendents communicated directly with the NPS’s leadership, White had initiated an important challenge to accepted policy from the local level. In an instant, fire in the national park system had become more than a management issue; it was also a public issue of considerable import.

Even more telling, an investigation into the 1928 fire revealed that the National Park Service had been an active participant in fighting the fire, not the detriment that

¹⁰⁹ Winkler and Winkler, “Ansel Hall,” *National Park Service: The First 75 Years*, 21.

¹¹⁰ Shankland, *Steve Mather of the National Parks*, 259-262; Swain, *Wilderness Defender: Horace M. Albright and American Conservation*; Winkler and Winkler, “Ansel Hall,” *National Park Service: The First 75 Years*, 21; Pyne, *Fire in America*, 298.

¹¹¹ Shankland, *Steve Mather of the National Parks*, 262; Pyne, *Fire in America*, 112.

some news sources reported. Initial newspaper reports claimed that because of White's belief in light burning, the NPS had not responded to the fire with all of its capabilities. In truth, the investigation showed, the Service aggressively fought the fire inside and outside Sequoia's boundaries, and it spent more per acre doing so than any of its counterparts. Still, White's beliefs attracted negative attention and seemed to affect his rangers' morale. Albright often fired people for public disagreements with National Park Service policy, but White dated from the earliest days of the Service and remained a proven administrator. Rather than level his wrath at a dependable man who had been an important part of the NPS so long, Albright simply assured other agencies that White's emphasis on light burning did not reflect NPS policy.¹¹²

The creation of the Forest Protection Board in 1927 further isolated White and his viewpoint. The 1924 Clark-McNary Act created the context for greater federal-state cooperation through the Forest Service and the board was established in 1927 to coordinate fire management activities among federal agencies. Dominated by the Forest Service and its increasing fire hegemony, the board became the primary federal policy-making body for forests. Other agencies easily bent to the Forest Service's perspective. Not only had that agency made great strides in fire suppression under Chief Forester William Greeley during the 1920s, but the Forest Service still held the only blank check for fire fighting. With his calls for light burning, White made the NPS look unruly and out of touch, threatening the image Mather and Albright sought for the Service. Colonel White's lone voice was drowned in the Forest Service's rise to leadership in fire fighting and the National Park Service's acquiescence.

With the controversy raging, the National Park Service looked for someone with a strong background in fire management and the ability to explain and address the different facets of this contentious issue. Most of the nation's fire expertise was housed in the Forest Service, throughout the 1920s a common place for the NPS to seek specialized professionals. With California figuring so prominently in the light-burning controversy, Service officials focused on finding someone with experience in the Golden State. They settled on John D. Coffman, supervisor of the California National Forest, now the Mendocino National Forest, home to numerous light-burning advocates. An experienced forester and forest manager, he brought a compendium of skills and knowledge that the NPS had not previously possessed. And he had successfully squelched light burning, an attribute that increased his desirability to the Service. If anyone could mend the NPS's tattered reputation about fire, it was someone of Coffman's stature.¹¹³

Coffman found little to impress him when he became the sole Fire Control Expert in the NPS. The National Park Service had devoted little of its resources to creating a permanent response to fire. As late as 1929, the Service's entire fire corps consisted of Coffman, a special fire organization at Glacier National Park that was one more result of the 1926 fire, and a sole fire guard at Sequoia National Park. Although he actively developed larger administrative functions, in particular making the NPS an important

¹¹² Horace M. Albright to M. B. Pratt, November 1, 1928; Superintendent, Sequoia National Park to H. M. Albright, November 8, 1928; J. D. Coffman, Memorandum Re: Colonel White's Letter of November 8, November 12, 1928, Fire Records, 1904-1930, Box F2, Sequoia National Park.

¹¹³ Shankland, *Steve Mather of the National Parks*, 262; Pyne, *Fire in America*, 112; Carle, *Burning Questions*, 135-37.

presence in the Forest Protection Board, Coffman faced the same problem that had vexed the Service since it began. Treated as a local rather than as a national issue, fire did not command limited resources. Congress did not allocate sufficient funds to manage fire in the parks and the Service's national leadership persisted in seeing fire as a local problem that episodically flared to higher levels. Although Coffman's hiring was an important symbolic gesture, he alone could not reverse what were really four-decade-old trends. The dollar figures remained ludicrous; in 1928, the year Coffman was hired, the NPS received \$30,000 to manage fire on its 6,133,614 acres. Unless, as White argued in 1926, the Service could secure appropriations "before rather than after needs arise," it seemed unlikely that Coffman's expertise alone could solve the issues that the NPS faced.¹¹⁴

Still, Coffman built the beginning of an organizational structure to address fire. In 1928, he produced the first Forest Protection Requirements report, a document necessitated by the National Park Service's membership in the Forest Protection Board. On the ground, his efforts focused on problem parks, Glacier especially. Neither the California parks nor Yellowstone suffered great fires in the late 1920s. Nor did other parks experience severe fire seasons during this generally wet time, providing the NPS's first fire boss with a little breathing room. Coffman could focus on his greatest problem, Glacier, where his special fire force manned four lookouts on the park's western side while he considered a fifth lookout on Mt. Brown. The Forest Service's Moran ranger station provided training for NPS fire guards and lookouts, providing another measure of cooperation between the two feuding agencies. In early summer 1929, park guards and lookouts detected and suppressed thirty-seven fires, a major accomplishment. Despite the obvious limitations, Coffman recognized progress from his efforts. The primary obstacle to greater success remained basic lack of resources that limited the effectiveness of his endeavors.¹¹⁵

Coffman also introduced fire planning to the National Park Service, a major step forward. He transferred Forest Service planning procedures, which evolved from regional forester and Forest Service stalwart Coert duBois's classic *Systematic Fire Protection in the California Forests*. Coffman brought the Forest Service's implementation model to the Park Service. The NPS had accepted the ideas in principle before that time, but had not acted on them in any systematic way. The duBois model was a plan for efficiency: it told how to do better what the Service decided to do, not what it ought to do. In this way, policy followed from procedures. The Forest Protection Board mandated the development of fire control plans, and in an effort to show its sincerity about membership in the organization, the National Park Service ordered fire control plans for all its parks.¹¹⁶

Glacier became the National Park Service's focal point, for no park in the 1920s provided a better example of the need for fire planning. At the time the Service hired Coffman, Glacier had become the NPS's major fire park, and its issues dominated the thinking of the Service's new and enthusiastic fire specialist. In interviews many years

¹¹⁴ Yearly Report of Superintendent (Col. John R. White), 1926, Man – L – Box 3, Sequoia National Park Archives; Pyne, *Fire in America*, 270, 298.

¹¹⁵ "Fire History of Glacier National Park (Based on extracts from Glacier National Park Master Plan and other records), NARA, RG 79.7, Glacier National Park, Box 23.

¹¹⁶ Pyne, *Fire in America*, 298; Coert duBois, *Systematic Fire Protection in California* (San Francisco, CA: USDA Forest Service, Pacific Southwest Region, 1914).

later, Coffman recalled the time as exhilarating. He believed that Glacier served as a template for the issues of fire in the national parks, and that if he could solve the problem of fire there, he could create a model that would apply throughout the park system.¹¹⁷ Essentially a one-man fire program, Coffman focused his efforts on Glacier National Park because its situation seemed to him both most critical in the need for response and most characteristic of the problems he found his new agency facing.

In spring 1929, Coffman and Chief Ranger F.L. Carter drafted a fire control plan at Glacier National Park, the very first such effort in any national park area. The document outlined an organizational structure, with the park's chief ranger as its fire chief and each district ranger responsible for prevention within his area. All lower-echelon fire crewmembers reported to the district ranger. A dispatcher at the park headquarters initiated action on all fires and kept track of the disposition of crews and fire-fighting equipment. The plan dictated reporting requirements, emphasized the need for cooperation with other agencies, and provided instructions for maintenance of communication sets and other equipment.¹¹⁸

That plan proved a model for the National Park. Beginning in 1930, Coffman initiated the fire plans at other parks. Remarkable attention to detail accentuated the gravity of the issues addressed in the plan, the emphasis on structure reflected both the military character of the early National Park Service and the inherited legacy of the Forest Service's need for close administration of its decentralized agency. The tight organization the plan demanded spoke volumes about the need for precision and dependability when fire struck. For the better part of a decade, in Coffman's estimation, the Glacier plan stood as the Service's best.¹¹⁹ It served as clear proof of the impact Coffman had on agency fire policy.

The reality of fire differed greatly from even the most meticulous plans, and another serious fire at Glacier seriously challenged Coffman's structure. In August 1929, just a few months after the plan had been adopted, a fire broke out in slashings cut by the State Lumber Company on private land ten miles from the park boundary. The fire began at 4:40 pm on Friday, August 16, and was reported almost instantly. Thirty-five men promptly fought the fire, a number that quickly increased to 165, but they could not stop it in the dry conditions and high winds. Wind proved the catalyst for the fire's rapid spread, negating the efforts of men on the fire lines and pushing the fire beyond the trenches they had dug. The NPS watched carefully during the first few days, its rangers visiting the fire camps outside Glacier. As late as August 18, most agreed that the fire would not reach the park. That expectation proved too optimistic. "The wind blew hard all Sunday night," Coffman recounted in his summary of the fire, and on August 21, five days after it began, it jumped the park boundary.

A crown fire "of the most destructive type," Superintendent J. Ross Eakin later wrote in his annual report, the Half Moon fire was "beyond human agency to stop." Immediately, the call went out for reinforcements. Coffman arrived at Glacier on August 23 to bring administrative and front-line experience. The NPS hired temporary fire

¹¹⁷ John D. Coffman, interview by Herbert Evison, October 29, 1962, Herbert Evison Papers, Western History Collection, Denver Public Library, Denver, Colorado.

¹¹⁸ Glacier National Park Fire Control Plan: Instructions for the Fire Protection Organization, NARA, RG 79.7, Glacier National Park. Box 976.

¹¹⁹ John Coffman interview, October 29, 1962.

fighters but could not stop the blaze. It burned through the park, missing the headquarters building by a half mile, but burning buildings at Apgar and scorching about two miles of shoreline at Lake McDonald. In the end, the fire raged for more than two weeks. “Despite desperate efforts to check it,” Horace Albright observed, the fire proved its “particular viciousness.” Only after a rain in early September did the fire die down enough to allow fire crews from other parks to begin to return to their regular duties. Finally, on September 5, Glacier declared the fire under control. In the final damage assessment, as much as 50,000 acres of timber inside the park burned and an equal amount of damage outside its boundaries was reported.¹²⁰ Fighting the fire cost more than \$120,000 and required more than 700 firefighters at the peak.

The analysis of the Half Moon fire represented a new dimension in the Service’s response. Coffman took the lead, authoring an authoritative twenty-page report that included a chronology, the various perspectives, and the most solid analysis of a fire the NPS had yet produced. By the time the blaze began, the National Park Service had successfully suppressed twenty-nine fires inside Glacier and another fourteen beyond its boundaries in 1929 alone. Coffman was “justly proud” of this record and regarded this as proof of the NPS’s efficiency. In his view, suppression required “quick detection followed by quick attack with an adequate number of firefighters.” The Service met that test all year; Coffman believed that the failure of the private timber company to provide rapid response was the factor that allowed it to spread to Glacier.¹²¹

Coffman strongly defended the Service. Understaffed, National Park Service crews concentrated on protecting government property, particularly the park headquarters. This decision drew the ire of private landowners inside Glacier’s boundaries. Some even demanded payment for the work they did to protect their own property. Coffman persuasively argued that landowners outside the park provided their own fire protection, often hiring firefighters from the same pools of labor that the National Park Service utilized. He saw no reason landowners inside Glacier should expect preferential treatment and saw even less justification for their claims of reimbursement. Superintendent Eakin made a convincing argument that the destruction of the park headquarters, a \$200,000 investment, would have crippled the National Park Service’s fire-fighting response. “Had Headquarters burned,” he insisted, “we would have been practically helpless to combat the fire after the high wind subsided . . . Had I scattered our forces and lost Headquarters, my position would be untenable.”¹²²

Even more, the National Park Service learned important lessons about the power of the fire. Half Moon was truly stunning, a fire that fed on itself and spread as a result of brutal weather conditions. It had been quickly detected, but even rapid reporting did not allow a more comprehensive response. Instead, Half Moon mirrored the fires of 1910 and 1926 at Glacier, in which people did what they could, but only the rain on September 2 dampened the fire and made control possible.

¹²⁰ Superintendent’s Annual Report, 1929, 1; Fire History of Glacier National Park: Based on extracts from Glacier National Park Master Plan and other records, 2; Horace M. Albright to Walter Newton, October 25, 1929, NARA, RG 79.7, Glacier National Park, Box 254.

¹²¹ John D. Coffman, “Review of Half Moon Fire – 1929,” NARA, RG 79.7, Glacier National Park, Box 254, 1-17.

¹²² *Ibid.*, 18-20; J. Ross Eakin to the Director, October 12, 1929, NARA, RG 79.7, Glacier National Park, Box 254.

Half Moon illustrated the agency's primary problems: catastrophic fire remained impossible to contain and its impact negated many of the positive results of planning and preparatory work. Coffman's strategy worked with small fires. But all the preparation in the world meant little when faced with an enormous and out-of-control fire. Without better technology, more resources, more people, and better planning, the National Park Service could not manage large fires. Even more, fires that began outside park boundaries asked difficult questions of NPS managers. The Service had to determine whether it should fight fires beyond its borders as a preemptive strategy. Half Moon reaffirmed that the Service could easily handle small-scale fire on a daily basis; it challenged every NPS assumption about how to deal with catastrophic fire.

In the aftermath of the 1929 Glacier fire, the National Park Service looked for guilty parties to help defray the cost as the park tried to cope with the physical and psychological damage such a large fire caused. The dilatory nature of the response of the State Lumber Company prompted the NPS to consider suing for damages. The company asserted that it had fought the fire as well as it could, even surrounding one fire. Its crews built ten miles of fire line and John R. Stolze, on behalf of the company, insisted that the company's presence was an asset rather than a detriment when faced with fire. In the end, Coffman agreed that the chances of the Service recouping any of its costs were so slim as to make a lawsuit impractical.¹²³ Superintendent Eakin was the most affected. He had invested a good portion of his resources in establishing a firefighting organization that had succeeded for much of a difficult year. Suppression could work, Eakin and Coffman were certain, but only when the Service could apply its techniques directly to the fire before it exceeded a certain size.

Even as the National Park Service dealt with the aftermath of the Glacier fire, larger economic changes altered the climate in which it operated. The stock market crash of 1929 hurt funding prospects. Within a year, the federal government slashed expenditures, cut programs, and otherwise sought to staunch the flow of dollars. National parks were not immune. The National Park Service's popularity with the public stood it in good stead, but the funding to support programs could not be found, and it entered a difficult time. The Service's role in society seemed frivolous when almost a quarter of the nation's population was out of work. Even the National Park Service's celebrated political cachet did not serve it well after the stock market crash. The loyal Albright, a staunch Republican all his life, was rebuked by Ted Joslin, a White House staff member, when he quietly informed him that his informal poll revealed that Hoover would lose the election. Stunned, Albright realized that in such times, even a popular agency such as the NPS had to expect cuts in its resource base.¹²⁴

By this time, the Service had accepted suppression and fire exclusion as agency policy. Dissent still existed, but it had been confined, isolated, and explained to other agencies. The Service's institutional structure had coalesced during the 1920s, and fire control policy became one dimension of that maturation. At the same time, fire exclusion was fantasy. No agency, not even the Forest Service, could fight every major fire and no one could really do much about major blazes. Available resources were directed to the

¹²³ John R. Stoltze, "Commentary on 'Half Moon' Forest Fires;" Horace M. Albright to Walter H. Newton, October 25, 1929, NARA, RG 79.7, Glacier National Park, Box 24.

¹²⁴ Swain, *Wilderness Defender*, 206-08.

places with the highest value, but even those resources were not always sufficient to stave off disaster.

The National Park Service accepted a secondary role in fire suppression, subordinating itself to the Forest Service. The Forest Protection Board served as the vehicle that made this otherwise awkward relationship between the two agencies function. The Forest Service controlled the board and the mutual aid agreements that stemmed from it. The National Park Service easily took a lesser role in this process. When the NPS needed fire expertise, it went to the Forest Service; when it hired for its own fire positions, it filled them by luring away Forest Service staff. As a result, the agency's position developed into a reflection of the Forest Service's.

Yet the same dilemmas remained, made worse by the Depression of 1929. The National Park Service lacked the resources to fulfill the mandate it laid out for itself. Unlike the Forest Service, which by the 1930s had a broad enough institutional base to assure more than a tepid response in most circumstances, the NPS had no depth to plumb, nowhere near the fiscal reach of the Forest Service when it sought short-term labor such as casual firefighters. This poverty turned out to be a disguised blessing, although one that the Service leadership did not recognize at the time. Because the NPS could not suppress fire with the vigor it wanted, fire and the ecological benefits it brought persisted in many places in the national park system. The lack of resources to fight fire prevented an overzealous response.

The lack of agency resources and the prominence of the Forest Service confirmed the foresters' position as the lead federal agency in firefighting. The National Park Service ceded any claim it had to a position of primacy, willingly acquiescing to the ascendancy of the USFS. Through cooperative fire protection, it established national hegemony and the Forest Service became the voice of fire management. For its part, the National Park Service wished fire would simply go away. Since fire was an endemic condition in the parks, the Service moved to quell it and with it, any unfavorable publicity it generated. The model for NPS strategy was the Forest Service, which used its many friends in Congress to stake out a claim to most of the firefighting resources in the country. The rivalry between the two agencies, so vituperative in the transfer of lands, was muted in fire policy as the National Park Service accepted a secondary role.

By the time Franklin D. Roosevelt was elected president in November 1932, four years after Coffman had been hired, the National Park Service could point to significant improvement in its understanding of how to address fire, but as a result of the Depression, no overall improvement in its ability to respond. The agency had become a follower rather than a leader. With White's lone voice advocating controlled burning, suppression remained the order of the day, but the agency could not even claim to be able to fight major fires. The first sixteen years of National Park Service history taught hard lessons about fire: try as it may, the Service could not fulfill its goal of suppressing fire with the resources available to it

Chapter Three:

A Decade of Transformation:

The New Deal and Fire Policy

Beginning in 1933, a set of dramatic changes in the way the federal government operated in the United States led to the implementation of a full-scale National Park Service fire management regime. The National Park Service developed and adhered to a strategy that almost perfectly mirrored the avid fire suppression tenets of the U.S. Forest Service, taking its cues from that agency, and applying the resource-heavy philosophy to the national parks. In no small part a result of the influence of people such as the agency's first fire boss, John D. Coffman, the National Park Service embraced the doctrine of suppression as the best strategy for protecting national park lands from what its staff widely regarded as the scourge of fire. Fire suppression and all it meant dominated the NPS view of fire.

In 1933 the NPS finally received the labor and financial resources to implement a comprehensive fire management strategy. New resources extended fire protection everywhere on public lands. The Civilian Conservation Corps (CCC), a New Deal fusion of labor policy and conservation, provided the manpower to enhance fire control and prevention. The National Park Service could finally fulfill its image as the protector of pristine nature. The National Park Service suppressed fire because it could secure funding and workpower to do so, because the practice was consistent with the management goals it had developed during its first fifteen years, and equally important, because it allowed the Service to keep its major parks in a condition acceptable to its constituents. National parks were seen as the emblem of American nature, a physical manifestation of the meaning of nationhood. Expansive forests with mature trees were an important component of that image, and preserving the symbol became as important as protecting the resource. In effect, this distinction separated the NPS from the Forest Service, giving it a broader motive for suppressing fire.¹²⁵

The national parks were only part of a larger strategy on federal land. The New Deal, Franklin D. Roosevelt's program to counter the ongoing economic malaise that began in 1929, extended resources to every federal agency, and no single entity made greater use of them than the Forest Service. National forests received even greater largesse than did the national parks and the foresters responded with vigor. With its new resources, the Forest Service conceived of an end to historic boundaries in its ability to fight fire. It tackled suppression in the backcountry as well as near developed areas.

The result was a new vision of suppression. If federal agencies operated in a climate of uncertainty until after 1932, in the aftermath of the New Deal, they had new confidence, derived from the plethora of resources at their disposal and the aggressive

¹²⁵ Alfred Runte, *National Parks: The American Experience* 2d ed. (Lincoln: University of Nebraska Press, 1987), 33-47; Richard W. Sellars, *Preserving Nature in the National Parks* (New Haven: Yale University Press, 1997), 140-44.

leadership of the Forest Service. The idea that no acre of national forest was beyond the foresters' control reflected American attitudes toward nature: science, technology, and resources could bring it to submission. This same extension of reach satisfied federal land managers.¹²⁶ It extended beyond the national forests, to places deep in the backcountry of the national parks.

At the same time, the National Park Service never forgot it was different than the USFS and that the foresters represented its main competition. Throughout the 1920s and 1930s, the two agencies were locked in a fierce struggle over land in which the National Park Service gradually gained dominance.¹²⁷ The rivalry was severe at times, inspiring animosity that was at once substantive and petty, meaningful and ridiculous. Fire defied administrative rivalry as well as the jurisdictional boundaries between federal agencies. Even in the worst moments of internecine conflict, the National Park Service and the Forest Service cooperated to prepare for fire and control its consequences. At the same time, national parks were different from national forests, and it served the National Park Service well to enunciate those differences whenever possible. As the National Park Service created a mission of fire management that replicated the actions of the Forest Service, it espoused a different agenda for a set of reasons that had more to do with the Service's vision of itself as keeper of American sacred spaces than it did with the goal of fire suppression.

Nor did actual conditions compel the National Park Service to reconsider its fealty to the idea of suppression. Again, the Service was fortunate. The drought years of the early 1930s coincided with the greatest influx of resources in the agency's history, and as had been the case earlier, fire protection activities dovetailed with other National Park Service objectives. They had the added attraction of being able to provide work to enough young men to bring the National Park Service to the center of government efforts to create jobs for a financially ravaged and despondent nation. In a decade-long push, the National Park Service was able to implement a conservation program that combined with infrastructure to make a formal regime of suppression possible within national park boundaries.

New Deal resources allowed the National Park Service to expand fire protection throughout every major national park.¹²⁸ Prior to the New Deal, NPS fire response often was concentrated on the areas closest to headquarters, visitor centers, campgrounds, and other facilities. This situation simply was a function of the available resources. With New Deal programming, the National Park Service was able to extend the reach of its suppression programs to remote areas in national parks, to monitor distant fires, and to construct fire roads and pathways to once isolated locations. Finally confronted by the

¹²⁶ David Clary, *Timber and the Forest Service* (Lawrence: University Press of Kansas, 1986), 94-106; Ronald Foresta, *America's National Parks and Their Keepers* (Washington, D.C.: Resources for the Future, 1984), 43-47; Donald Worster, *Rivers of Empire: Water, Aridity, and the Growth of the American West* (New York: Oxford University Press, 1986), 10-15, 330-34.

¹²⁷ Ben W. Twight, *Organizational Values and Political Power: The Forest Service Versus Olympic National Park* (State College: Pennsylvania State University Press, 1983), 1-16; Hal K. Rothman, "'A Regular Ding-Dong Fight': Agency Culture and Evolution in the Park Service-Forest Service Dispute, 1916-1937," *Western Historical Quarterly* 20 2 (May 1989), 141-61; Hal K. Rothman, *American Eden: An Administrative History of Olympic National Park*, (Draft, December 2003), 1-4; 39-73

¹²⁸ Sellars, *Preserving Nature in the National Parks*, 126-27; Stephen J. Pyne, *Fire in America: A Cultural History of Wildland and Rural Fire* (Princeton: Princeton University Press, 1982), 298-99.

vast weight of federal resources and the workpower it provided, fire seemed as if it were one more of the many natural problems yielding to human ingenuity and technology.

Before the New Deal, the image of fire protection in the National Park Service exceeded the reality of implementation. Without adequate resources, John D. Coffman's meticulous fire plans and the strategies he proposed for the park system remained a far-off ideal. The National Park Service had recognized the problem and created a context for addressing it, but until resources were devoted specifically to fire suppression, controlling and responding to fire competed with everything else that occurred at a national park. The nation's premier national park, Yellowstone faced the same predicament as every other park area. The resources available were not equal to the task of fire management. Fire protection – the art of recognizing fire and quickly responding with a suppression strategy – became a stand-in for suppression even at the brightest of the Service's crown jewels.

When Coffman developed in 1929 the first fire analysis of Yellowstone, a source of episodic major fires, he announced that protection was “not normally a very serious [problem],” as long as crews “discovered and controlled promptly” any fires, preventing them from becoming crown fires that would spread uncontrollably. This set a standard, creating an expectation that the park would find and address any fire. Coffman believed in prompt detection, but found the number of Yellowstone fire lookouts, two – one on Mt. Washburn and the other on Mt. Sheridan – inadequate to the task. Neither lookout contained sufficient facilities to allow a spotter to spend the day and night. In most cases, a fire observer made a daily trip from the nearest station to the lookout post.¹²⁹ The situation at Yellowstone was better than at most parks, but it was far short of what Coffman and the National Park Service envisioned.

Fires in Yellowstone during the summer of 1931, two years after implementation of Coffman's fire plan there, characterized the limits of protection before the New Deal. Yellowstone had not experienced a serious fire since 1919, and even before 1931, Superintendent Roger Toll worried that the park staff had grown complacent, and was not terribly vigilant about fire. After many years without a major fire, they discounted the danger. Yellowstone simply did not experience serious fires, many insisted. That summer, they were proven wrong. The park faced 112 fires, twenty-five of which required fire crews. More than 20,000 acres of timber burned before crews contained the outbreaks. No one could claim after 1931 that fire was not a threat at Yellowstone. “The experience of the past summer,” Toll drolly observed in his annual report, “has thrown this belief into the discard pile.”¹³⁰

From another perspective, Coffman's plan for Yellowstone revealed some success: the fires were managed effectively. In a drought year, with a hot dry summer following a mild winter with light snowfall, Coffman's preparatory system assured rapid response when a fire started and lookouts quickly discovered its existence. Several fires broke out in remote areas in Yellowstone, but the park's fire stations soon sighted them. With hard work from the road maintenance crew and the rangers, and deployment of the very caches of fire equipment and supplies that Coffman insisted upon two years earlier, the park was able to keep those remote outbreaks from becoming a serious threat. Even

¹²⁹ John D. Coffman, “Report on Fire Protection Requirements of Yellowstone National Park, 1929,” Yellowstone Box Y-223, Yellowstone National Park Archives.

¹³⁰ Roger W. Toll, “Annual Report for Yellowstone National Park 1931,” 1.

the worst fire, an 18,000-acre blaze near Heart Lake, was under control at the end of the second week of response. Coffman could look at his plans and see real success: Yellowstone had experienced a serious fire season but was able to keep the many fires from causing severe problems.¹³¹

From Superintendent Toll's point of view, the plan's cost to the park was simply more than could be borne. He calculated that the total cost of fighting the fires exceeded \$150,000, stripping Yellowstone of a good portion of its road maintenance budget and limiting facilities development. "The entire ranger personnel as far as possible was used on fire protection work," Toll noted, at great cost to nearly every other park program. In one instance, efforts to control insects such as mountain pine beetles were drained of resources by the cost of fighting fire.¹³² The fires may have been stopped, he averred, but the cost of the fire season impeded every other National Park Service program at its premier national park.

Yellowstone received special attention even during the worst of times. In 1932, in part to compensate for the expenditures that resulted from the 1931 fire, the park obtained \$122,780 in emergency reconstruction and fire-fighting funds and an additional \$16,300 dedicated to forest protection and fire prevention, sums so grand that they represented five times the amount allocated for fire in the entire park system just a few years before. The injection of resources prompted greater planning and cooperation between federal agencies involved in fire fighting in the Yellowstone region. In 1932, three important fire conferences took place in the park. The first brought together the heads of all government departments and the protection staff in the vicinity to discuss fire principles and to develop strategies for cooperation. In addition, Yellowstone convened a summit with Forest Service officials to discuss cooperation between the park and the surrounding national forests and John Coffman also presented a three-day fire training symposia.¹³³ That year alone, Yellowstone engaged in more planning than in any previous year. At the same time, the park tacitly admitted that managing fire required the cooperation of surrounding jurisdictions.

Yellowstone demonstrated that the conundrum that eternally vexed the National Park Service remained: suppression seemed an attainable goal, but the Service could not implement it and accomplish all the other priorities that NPS managers, Congress, and the public had for the park system. The Service's most basic priorities remained land acquisition and facilities development to accommodate the ever-growing number of visitors the NPS encouraged. In this era, landscape architects dominated the National Park Service and their leadership vision promoted planning and development. The Service sought to expand its domain as well. After 1929, NPS Director Horace M. Albright turned much of his attention to acquiring eastern parks and the nation's historic sites.¹³⁴ When NPS leaders received resources, they still typically devoted them to visitor

¹³¹ Ibid, 1; John Coffman interview by Herbert Evison, October 28, 1962, Denver Public Library, Western History Collection, NPS Cons 56 Box 1, Folder C, 6, 13; John D. Coffman, "Report on Fire Protection Requirements of Yellowstone National Park," January 18, 1930, Yellowstone Box Y-223, Yellowstone National Park Archives.

¹³² Roger W. Toll, "Annual Report for Yellowstone National Park 1931," 2-3.

¹³³ Annual Report of the Superintendent of Yellowstone National Park, 1932, 3-4.

¹³⁴ Horace M. Albright, *Origins of National Park Service Administration of Historic Sites* (Philadelphia: Eastern National Parks and Monuments Association, 1971), 1-17; Ethan Carr, *Wilderness by*

services or access to national parks. Fire was a recognized threat to those parks, as Coffman's hiring attested, but planning a response and providing the resources to implement it were significantly different steps in a long process. As a result, the National Park Service continued to respond to fires where and when they occurred, dramatically limited by the absence of resources to implement any plan that Coffman might conceive.

Despite ambiguity about the battle against fire in Yellowstone in 1931, the situation provided proof that Coffman had made tremendous progress in developing a fire policy. As the 1932 elections approached, Albright and others in the National Park Service recognized the scope of Coffman's accomplishments, and invited him to the annual national park superintendent's conference in Washington, D.C., to brief NPS line staff on his efforts. At the time, the superintendent's annual meeting was the most important event in the National Park Service's operational year and Coffman's appearance accentuated the significance of his work.¹³⁵ The National Park Service granted fire control increasing importance. The NPS cadre of chief field officials heard from the man in charge of fire, learning what they might do when the inevitable reached them. A significant problem remained: without resources or a staff dedicated to the purpose, much of Coffman's planning seemed beyond the Service's reach. A plan could only be as good as the implementation structure that underpinned it and the National Park Service still had little in the way of resources to bring to fire management.

While Yellowstone's size and position gave it some flexibility to respond to fires, the absence of infrastructure and resources was even greater elsewhere in the system. Yellowstone's privileged status accorded it a disproportionate share of National Park Service resources under any circumstances. In most years between 1920 and 1933, Yellowstone's funding exceeded that of the next three national parks combined. If fire protection at Yellowstone was inadequate, it was far worse almost everywhere else in the park system.¹³⁶

Coffman's hiring had inaugurated a new era in the National Park Service, and he spent his first two years in the Service traveling to parks and writing one fire plan after another. Although occasionally someone such as Sequoia National Park Superintendent John R. White might disagree with him, no one disputed that Coffman was the Service's guiding force as well as the lead person for fire management. Coffman formulated a servicewide fire policy, which would require a fire plan from each unit in the system. The Glacier National Park plan he began during his first days on the job became the Service's benchmark, the model against which other plans were measured for the subsequent decade. His efforts quickly yielded a considerable body of preparatory material. Fire plans and information maps for planning a response to fires became standard at national

Design: Landscape Architecture and the National Park Service (Lincoln: University of Nebraska Press, 1998), 55-94.

¹³⁵ Coffman interview, October 29, 1962, 14; Swain, *Wilderness Defender*, 184-88.

¹³⁶ Report of the Director of the National Park Service for the Fiscal Year Ended June 30, 1926 (Washington, D.C.: Government Printing Office, 1926), 32, 33; Report of the Director of the National Park Service for the Fiscal Year Ended June 30, 1926 (Washington, D.C.: Government Printing Office, 1928), 41-43; Paul Schullery and Lee Whittlesey, *Myth and History in the Creation of Yellowstone National Park* (Lincoln: University of Nebraska Press, 2003), 92-99; Chris J. Magoc, *Yellowstone: The Creation and Selling of an American Landscape* (Albuquerque: University of New Mexico Press, 1999), 235-54; Mark Barringer, *Selling Yellowstone: Capitalism and the Construction of Nature* (Lawrence: University Press of Kansas, 2002), 1-16.

parcs. The Clarke-McNary Act of 1924 granted the NPS access to federal fire protection funds administered by the Forest Service under a complex array of formulas. National Park Service estimates of cost for fire fighting – with estimates of reportable expenses permitted under Clarke-McNary, added to plans of response and deployment of equipment in the case of emergency – furthered the image of the NPS as a competent, professional organization. The new circumstances even enhanced the coveted pseudo-military image of the NPS, already accentuated by the olive drab, World War I era National Park Service uniform.¹³⁷

The New Deal and the resources it furnished changed the context in which the National Park Service operated. The largess permitted the implementation of Coffman's program, a significant fire suppression regime backed by enough workpower and resources to inspire confidence in the idea of fire suppression in the national parks. President Franklin D. Roosevelt's constellation of programs to revive the U.S. economy and with it the national spirit transformed the country. The New Deal inaugurated powerful and lasting changes in the role of government in the United States. Before 1933, federal government officials only had a peripheral role in daily life for most Americans. Despite the ideals and reforms of the Progressive Era and the pivotal expansion it created in government responsibility, most of the changes inaugurated from 1900 to 1932 were regulatory in character. By 1933, the federal government contained agencies that administered public affairs in the most general of ways, but it still lacked the mechanisms to create day-to-day realities for most ordinary Americans.¹³⁸

Of a privileged social and economic class, Progressives hewed to a top-down vision of U.S. society. They believed that if they made rules and laws, the rest of the republic would respect and obey any strictures they created. This vision embodied optimism and naïveté but strangely, it worked. In a top-down world, making rules seemed enough. Enforcing them was often beyond comprehension. Nor did national institutions offer compelling reasons to abide by rules and regulations. Before 1933, most people rarely looked to government as a source of employment and sustenance. Government was remote and occasionally oppressive, but it was usually far from daily life.¹³⁹

The New Deal inexorably altered the relationship between the national government and the people. Roosevelt brought a dramatic tenor of activism to presidential affairs, a hands-on approach to the nation's needs. The years following 1929 had been hard on Americans, hard on their pride and sense of destiny. After the Depression began, people began looking to national leadership for direction and

¹³⁷ John D. Coffman, "Memorandum for Chief Ranger Bagley," November 13, 1931, Yellowstone National Park, Records of the Branch of Forestry, Forest Fire Reports, 1928-1949, Yellowstone 1933-1941, Box 3; John D. Coffman, interview by Herbert Evison, October 29, 1962, NPS CONS 56, Box 1, Folder C, Western History Section, Denver Public Library, 9-13; Foresta, *America's National Parks and Their Keepers*, 33-37.

¹³⁸ Richard Polenberg, *Reorganizing Roosevelt's Government: The Controversy over Executive Reorganization, 1936-1939* (Cambridge: Harvard University Press, 1966), 1-11; Robert M. Crunden, *A Brief History of American Culture* (New York: Paragon House, 1994), 129-59, 185-236; T.J. Jackson Lears, *No Place of Grace: Anti-Modernism and the Transformation of American Culture, 1880-1920* 2d ed (Chicago: University of Chicago Press, 1994), 1-58.

¹³⁹ William Leuchtenburg, *Franklin D. Roosevelt and the New Deal* (New York: Harper and Row, 1963), 1-15; Samuel P. Hays, *Conservation and the Gospel of Efficiency* (Cambridge: Harvard University Press, 1959); Robert M. Crunden, *Ministers of Reform: The Progressives Achievement in American Culture, 1889-1920* (New York: Basic Books, 1982), 1-27.

guidance. During President Herbert Hoover's term, they did not find what they needed. Although one of the best prepared individuals ever to assume the presidency, Hoover did not grasp the public's profound need for inspiration, comfort, and direct assistance. A few governors, most notably Pennsylvania Governor and former Chief Forester Gifford Pinchot, initiated relief programs, but the administration's only response was to convene the Cabinet daily to toss a medicine ball on the White House lawn to project an image of fitness and strength to the nation.¹⁴⁰ In the 1932 election, an electorate that wanted something he could not provide chased Hoover from office.

Franklin D. Roosevelt recognized the need for government action, and the New Deal's many programs soon provided work for a distraught nation, primed the pump of the sluggish economy, and inspired hope. At the same time, the New Deal transformed conservation into labor policy. Under its auspices, conservation programs ranked as highly as capital development ventures – both put large numbers of people to work. Under New Deal programs, more work was done on federal land than had been accomplished in the forty years since conservation became a recognized ideal. The Tennessee Valley Authority, an enormous regional planning program designed to help the impoverished people of Appalachia, provided one component, as did programs to rehabilitate overgrazed Indian reservation lands and the Dust Bowl regions of Kansas, Colorado, New Mexico, Oklahoma, and Texas. Conservation required intensive workpower. No commodity existed in greater abundance in 1930s America. Conservation projects became one of the era's most essential employment devices.¹⁴¹

A few weeks into his presidency, Roosevelt proposed that an army of unemployed men be sent into the rural parts of the nation to perform basic work on federal and state land. They would work in forestry by clearing brush and trees and cutting fire trails, preventing soil erosion, and helping with flood control projects. As it developed, the CCC became one of the central institutions of the New Deal, part of the process by which the federal government put people to work and helped them see a positive future in an otherwise dismal economic time.¹⁴²

The creation of a federally funded work force gave land management agencies the opportunity to implement conservation programs that prior to 1933 had simply and completely been beyond their reach. The CCC developed plans for work on federal lands, hired hundreds of thousands of young men, and kept them at work in six-month increments called "enrollment periods." Young people flocked to these programs in search of opportunity, so scarce in the 1930s, and stayed as long as they could. Even more, the establishment of so many federal work relief programs inserted the government

¹⁴⁰ Char Miller, *Gifford Pinchot and the Making of Modern Environmentalism* (Washington, D.C.: Island Press, 2002), 315-18; Leuchtenburg, *Franklin D. Roosevelt and the New Deal*, 1-23; Kendrick A. Clements, *Hoover, Conservation, and Consumerism: Engineering the Good Life* (Lawrence: University Press of Kansas, 2000), 148-208; Richard Norton Smith, *An Uncommon Man: The Triumph of Herbert Hoover* (New York: Simon and Schuster, 1984), 7-14.

¹⁴¹ Hal K. Rothman, *Saving the Planet: The American Response to the Environment in the Twentieth Century* (Chicago: Ivan R. Dee, 2000), 60-84.

¹⁴² John C. Paige, *The National Park Service and the New Deal* (Washington, D.C.: National Park Service, 1985), 8-18.

directly into people's lives in ways the Progressives never envisioned, and changed people's vision of government.¹⁴³

The CCC was a godsend for a struggling nation. It took single men between the ages of eighteen and twenty-five and gave them hard physical work on the forests, parks, and other public lands of the United States. CCC workers were counted among the fortunate during the Depression. The young men lived in barracks, worked six days a week for a \$30 a month, all but five dollars of which was sent home to their families each month. They built roads, trails, firebreaks, structures, and a range of other necessities and amenities on public land. During its nine-year existence, more than two million enrollees worked in 198 CCC camps in national park areas and 697 camps in state, county, and municipal parks. The national forests and other public lands contained countless others. Under the bureaus that administered CCC programs – the Emergency Conservation Work program (ECW), the Public Works Administration (PWA), the Works Progress Administration (WPA), and others – crews built more than one thousand miles of park roads and 249 miles of parkways in national park areas.¹⁴⁴

The National Park Service under Horace Albright was nothing if not adaptable. The canny NPS director recognized in the New Deal an answer to every resource need the National Park Service had. Developing goals that meshed with the New Deal instantly became his primary focus. Despite his long history as a Republican, Albright embraced the new Democratic administration, making friends among the new leadership with dazzling speed. He and Roosevelt's Secretary of the Interior, the irascible Harold L. Ickes, found much common ground. Ickes had been a visitor in Yellowstone in the early 1920s, and he heard Albright, then superintendent, deliver an impressive talk. Ickes and Mather had been close and the secretary, a strong proponent of conservation and national parks, wanted to maintain that relationship with Albright. Not only did Ickes spend an extra hour with Albright at their first meeting, the relationship grew into weekend tours of historical sites in the Washington, D.C., area. A suspicious person by nature, Ickes learned to trust the affable if hard-edged Albright, giving the National Park Service and its director an edge as New Deal programming developed.¹⁴⁵

With Ickes's ear, Albright became an important figure in the new administration. His support for the New Deal and his recognition of what it could do for the National Park Service put him out ahead of the rest of the Department of the Interior. Albright cemented this recognition with his characteristic personal touch. On April 9, 1933, the director went on the most famous automobile ride in national park history. After lunch on a trip to Herbert Hoover's old retreat on the Rapidan River, Roosevelt told his staff that he wanted Albright in the jump seat of his car. In a discussion as the car rolled along the Rappahannock River, the director made his case for the transfer to the Park Service of historical parks and national monuments administered by other agencies. Albright and the president talked about other things, not the least of which was the value to the National

¹⁴³ Leuchtenburg, *Franklin D. Roosevelt and the New Deal*, 6-9; Rexford Tugwell, *FDR: Architect of an Era* (New York: Macmillan, 1967), i-xiv; Robert A. Caro, *The Years of Lyndon Johnson: The Path to Power* (New York: Alfred A. Knopf, 1982), 241-60; Phoebe Cutler, *The Public Landscape of the New Deal* (New Haven: Yale University Press, 1985), 1-8, 90-106.

¹⁴⁴ Paige, *The National Park Service and the New Deal*, 21-25.

¹⁴⁵ Horace Albright as told to Robert Cahn, *The Birth of the National Park Service: The Founding Years, 1913-1933* (Salt Lake City: Howe Brothers, 1985), 283-88; Tom H. Watkins, *Righteous Pilgrim: The Life and Times of Harold L. Ickes, 1874-1952* (New York: Henry Holt, 1990), 550-55.

Park Service of the Civilian Conservation Corps. With Roosevelt's approval and Ickes' beaming support, the director embarked on plans that would change the Service.¹⁴⁶

Long a champion of fire control, Albright drew Coffman into a pivotal role. Albright intuited one of the ideas that became a hallmark of the New Deal – programming that could be applied across geographical, regional, and even cultural differences. Fire control, which required similar deployment of resources almost everywhere it was necessary, easily fit such a model. Immediately after Roosevelt's inauguration, Horace Albright assigned Coffman to develop a report that showed how an emergency forestry and public works program could be implemented. The idea of CCC-like work camps had already been formed, and the ever-astute Albright recognized that the National Park Service could play a significant role and reap important benefits.¹⁴⁷

Starting March 15, 1933, Coffman was “busy night and day” developing the report that Albright sought. He delivered it on March 28 and awaited further instructions. Told to come to the nation's capital, Coffman arrived on April 3 and promptly joined Albright in a visit to the White House to learn what the president had in mind. Colonel Louis Howe, Roosevelt's long-time political operative who served as the most private of the president's private secretaries until his death in 1936, spoke with the two and introduced the National Park Service duo and a number of Forest Service and U.S. Army officials to Robert Fechner, the man Roosevelt had selected to head the Emergency Conservation Work program. Fechner already had a number of plans and Coffman discovered he was central to their implementation. “I didn't realize at the time that it was going to be eight-and-a-half months before I saw my family again,” Coffman recalled in 1962. “During the remainder of that year, I was the busiest I have ever been in my life.”¹⁴⁸

Under Albright's tutelage, Coffman vaulted to a position of influence and power. Albright's close relationship with Ickes landed the National Park Service authority for emergency conservation work within the Department of the Interior, as Ickes appointed the NPS director as the department's liaison to the ECW program. Albright in turn selected Coffman as his designee to serve in this critical role. The selection affirmed not only the importance of fire to Albright, but the director's faith in Coffman as well. Albright “requested me to work up a program of emergency forestry and public works that could be carried on by these youth camps that were planned for establishment,” Coffman remembered nearly three decades later. This department-wide charge was new to the National Park Service, until that time, a secondary bureau in the unwieldy Department of the Interior. It also presaged the largest conservation battle of the decade, Ickes' later attempt to create a Department of Conservation under his leadership that included the entire Department of Agriculture.¹⁴⁹

The pressure on Coffman was intense. The president set a goal of 250,000 at work by July 1, 1933, and although the number strained the limited administrative structure set up for the purpose, the National Park Service strove to meet the objective. Coffman

¹⁴⁶ Albright as told to Cahn, *The Birth of the National Park Service*, 288-90; Swain, *Wilderness Defender*, 219-25.

¹⁴⁷ Coffman interview, October 28, 1962; Albright as told to Cahn, *The Birth of the National Park Service*, 292-97; Swain, *Wilderness Defender*, 219-25; Caro, *The Path to Power*, 341-51.

¹⁴⁸ Coffman interview, October 28, 1962, 13-14.

¹⁴⁹ Coffman interview, October 28, 1962, 14; Watkins, *Righteous Pilgrim*, 447-594.

worked at a torrid pace. In May, the Service had places for 12,600 workers in sixty-three camps within the park system. An additional seventy camps were authorized and being prepared to accept enrollees. By the July 1 deadline, more than 34,000 people were enrolled in 172 emergency conservation work camps within the national park system, and the National Park Service had made plans to accommodate many thousands more.¹⁵⁰

The impact of New Deal programs on the National Park Service changed its trajectory. The NPS base budget increased from a little under \$11 million in 1933 to almost \$27 million in 1939. In addition, between 1933 and 1937, public works agencies poured more than \$150 million into projects in the national parks. The number of camps in national parks rose from seventy in 1933 to a peak of 115 in 1935, continuing with no less than seventy-seven through 1941. In addition, the National Park Service oversaw as many as 475 camps each year in state parks throughout the country. As many as 150,000 enrollees worked in National Park Service programs in the peak years, with more than 6,000 permanent supervisors.¹⁵¹

The process transformed the National Park Service's fire control infrastructure. In 1930, the entire park system only had seventeen primary fire lookouts. A decade later, as a result of the New Deal, sixty primary lookouts and fourteen secondary structures offered far more comprehensive ability to recognize and respond to fire. In 1930, the National Park Service employed twelve lookout observers and sixteen fire guards. By 1939, the numbers had increased to fifty-nine lookout observers, fifty-five fire guards, and six fire dispatchers paid by Clarke-McNary Act funds to supplement park rangers. Many others in the National Park Service and affiliated with it had fire protection as a component of their daily responsibilities. In addition, 754 miles of telephone lines, twenty guard cabins, forty-seven fire equipment storage buildings, 522 miles of roads, 1,767 miles of fire trails, 109 miles of firebreaks, and a range of other improvements enhanced NPS capacity. The National Park Service also developed fire danger rating stations.¹⁵²

The sheer number of workers in the program guaranteed that every wish list any superintendent in the park system had on hand became a blueprint for action. The ever-savvy Albright took note, observing in the agency's 1933 annual report that CCC crews accomplished "work that had been greatly needed for years." He used the New Deal to chastise opponents, pointing to its immediate successes as proof that the Service's approach had been correct. Recognizing the advantage of this new source of workpower and funding, Albright championed greater access to funding for the National Park Service from the moment he heard of the plan, and the agency's fate and the CCC were completely intertwined throughout the 1930s.¹⁵³

Fire prevention became one of primary responsibilities of CCC camps, altering the tenor of the NPS's response to any kind of blaze. After their arrival at national park areas, many crews began to construct firebreaks, remove deadwood, erect telephone lines for better emergency communication, build lookouts, and engage in other fire protection

¹⁵⁰ Leuchtenburg, *Franklin D. Roosevelt and the New Deal*, 11-15; Paige, *The National Park Service and the New Deal*, 11-19; 213.

¹⁵¹ Paige, *The National Park Service and the New Deal*, 18-19; 213.

¹⁵² L. F. Cook, "Forest Fire Protection in the National Park System, 1930-39," Occasional Forestry Note No. 5, March 25, 1940, Sequoia National Park, SNP 42, Box 375, F2, 5-6.

¹⁵³ Annual Report of the Director of the National Park Service, 1933 (Washington, D.C.: Government Printing Office, 1934), 2-4.

preparation. In the first year alone, ECW literature claimed that the presence of its workers reduced the amount of national park acreage lost to fire by 1,600 acres.¹⁵⁴ The availability of labor obliterated many of the resource issues that attended fire suppression, giving the National Park Service the ability to apply the tenets that Coffman had advocated since he joined the Service in 1928.

The combination of the seemingly endless supply of federal resources, the fear of more major fires, and the dominance of the Forest Service in fire policy and planning created de facto NPS policy. Successful suppression depended on resources. The contribution of federal relief programs to fire management in the park system was astonishing in its scope: 688,255 work days of fire fighting and 837,783 work days of fire suppression in the course of the program permitted a vision of National Park Service capabilities that would have seemed a dream a mere few years before 1933. Even as Coffman's responsibilities in the Roosevelt administration expanded, he thought about fire as the forester he was trained to be. The Forest Service model was already accepted as the only viable approach. With the obligation to administer programs in other agencies, the National Park Service followed the Forest Service lead. This tied the NPS to a policy that ran counter to National Park Service objectives in important ways. Fire as spectacle, creeping over the edge of Glacier Peak to the delight of tourists, was consistent with the Service's image of its obligation to accommodate visitors. Wild fire, which might very well have provided ecological benefit, was not.¹⁵⁵

The National Park Service's obligation to manage programs outside the Service was even more taxing. Responsibility for department-wide programs was new to the National Park Service. Despite forays into assisting state parks during the 1920s, the National Park Service usually had minded its own affairs. Only in the middle of the 1920s did it reach any kind of parity with the Forest Service, equaling that agency's political reach and finding its own cultural values more in tune with the tenor of the times. The breadth of the National Park Service's new responsibility was broad and wide. It included programs for the Indian Service, Bureau of Mines and other agencies within the Department of the Interior, as well as state parks throughout the nation. As Albright's primary operations manager for New Deal projects, Coffman found himself with responsibilities well beyond what he imagined just a few years before as a forest supervisor in the Forest Service.¹⁵⁶

To reward Coffman and reflect his new responsibility, Albright created a Field Education Division in the NPS's Branch of Research and Education and appointed Coffman division head under Branch Director Dr. Harold C. Bryant. The National Park Service already had established a tie between forestry and fire, the same relationship that The Forest Service had earlier developed. The arrangement gave the National Park Service a fire structure that paralleled the Forest Service's. Coffman initially balked at the appointment. His title in the National Park Service had been "fire control expert," with

¹⁵⁴ Emergency Conservation Work Press Release, October 23, 1933, NARA, RG 79.4.3, Records of Branch of Forestry; Third Report of the Director of Emergency Conservation Work, For the Period April 1934 to September 30, 1934 (With Certain Data from April 5, 1933 through September 30, 1934), 29-46.

¹⁵⁵ Robert Shankland, *Steve Mather of the National Park* (New York: Alfred A. Knopf, 1953s), 303.

¹⁵⁶ Coffman interview, October 28, 1962, 15-16; National Park Service, "Conference of Superintendents and Field Officers, Washington, D.C., November 19-23, 1934, 145; Harold L. Ickes, *The Secret Diary: The First Thousand Days, 1933-1936*, (New York: Simon and Schuster, 1954), 18-19; Shankland, *Steve Mather of the National Parks*, 297-303; Donald Swain, *Wilderness Defender*, 223.

the lead responsibility in forestry falling to Ansel Hall, the Berkeley-trained forester who served as chief naturalist in the Service. Hall nominally headed the National Park Service's forestry and fire-fighting efforts, but spent most of his time working on museums and park interpretation. Coffman's reticence about the offer was understandable. He and Hall had grown close during the more than five years they worked together, and he did not want to be seen as usurping his friend and superior. Albright reassured Coffman that he was not superseding Hall, and he accepted the appointment. The change represented an acknowledgement of the growing importance of Coffman and his fire programs. Coffman headed the new division, which vociferously promulgated the message of suppression. Coffman's division became the center of the Department of the Interior's fire management activity, transforming policy into practice.¹⁵⁷

When Coffman assessed models, the Forest Service still dominated the field of fire management. Well before the beginning of the New Deal, the foresters had made suppression their practical religion. Since an important regional foresters' conference in the nation's capital in 1930, the USFS settled on goals and contemplated the extension of their reach in fire management. This theme became a major element of the Copeland Report, a 1,677-page behemoth formally titled *A National Plan for American Forestry*, which the Forest Service unveiled just after Roosevelt took office. The tacit question that drove Forest Service policy was simultaneously simple and complex: how far could the National Park Service extend its systematic fire protection – in geographic, technical, administrative, and financial terms. By the early 1930s, the Service enjoyed technical capabilities, but complete exclusion of fire remained too much to ask of the era's technologies. An enormous domain and insufficient resources ensured that USFS officials recognized limits to their control. Instead, that Service fashioned different categories for the fire protection status of its lands: critical, marginal, and acceptable. Defining what constituted each category proved far more difficult than creating the structure in which they fit. Prompt and thorough protection or no protection at all were agreed upon as the available options for response.¹⁵⁸

Even as the National Park Service implemented the USFS ideal of suppression, powerful voices in the Forest Service were challenging that model in the aftermath of the 1934 Selway fires in Montana. Their severity prompted Elers Koch, a prominent forester whose personal history with fire stretched back even before the terrible summer of 1910, to question the agency's approach to fire. Speaking of the northern Rockies and the trails and roads that the Forest Service had cut to aid fire response, Koch saw a mistake – a destruction of wilderness to no avail. He “firmly believed that if the Forest Service had never expended a dollar in this country, there would be no appreciable difference in the area burned over.” Such a bold critique of existing practice from someone of Koch's stature guaranteed a hearing for the new set of ideas, but in the Forest Service, only the innovative Robert Marshall and the brilliant Aldo Leopold supported him. The rest of the

¹⁵⁷ Sellars, *Preserving Nature in the National Parks*, 126-27; Coffman interview, October 29, 1962, 16; J. F. Kieley, *A Brief History of the National Park Service* (Washington, D.C.: Civilian Conservation Corps, Department of the Interior, 1940); Harlan D. Unrau and G. Frank Williss, *Administrative History: Expansion of the National Park Service in the 1930s* (Denver: National Park Service Denver Service Center, 1983), 245.

¹⁵⁸ Pyne, *Fire in America*, 270-73, 346-50; David Carle, *Burning Questions: America's Fight with Nature's Fire* (Westport, CT: Praeger Press, 2002), 52.

National Park Service blamed a lack of resources as the problem and concocted even stronger measures to eradicate fire. Despite Koch's criticisms, suppression remained the dominant Forest Service model.¹⁵⁹

Forest Service policies such as the hour control program and the 10:00 a.m. standard illustrated that agency's technical proficiency and its commitment to the exclusion of fire. The Forest Service's research program emphasized fire protection. The goals it set – the 10:00 a.m. policy in particular, which specified that all fires be brought under control by 10:00 the morning after their sighting or by each successive morning at 10:00 – were only achievable with the resources of the New Deal. Federal programs such as the CCC permitted Forest Service leaders to think about fire in much larger terms than ever before. The programs created led to a level of implementation that no earlier era ever matched, and they gave the foresters greater autonomy. They no longer lamented the lack of the Army that had once helped the Department of the Interior, finding in the CCC their own general labor force. Instead, foresters launched the comprehensive modernization of the fire management system, replete with the goals of the early to middle twentieth century. The Forest Service began to use scientists and other professionals in its research program. With this plethora of resources now at their disposal, foresters expected no less than the complete conquest of fire. In this, they began to treat fire as they did other natural elements such as soil and water. This push for control of nature was the style of the era.¹⁶⁰

The National Park Service's aspirations in relation to fire were more modest. Coffman's roots in the Forest Service provided the National Park Service an advantage as it structured its fire and forest planning, but at the same time, what he advocated accentuated the USFS vision of fire management. With neither the cosmological viewpoint nor the overwhelming dread of fire and its consequences that stemmed from the summer of 1910, the National Park Service never quite accepted suppression as more than a policy objective. With its vision of protecting nature for visitation, the National Park Service utilized USFS procedures, but in a more flexible way. For the USFS, fire was a defining antagonist. The National Park Service readily absorbed USFS land and some of its practices, but it never reacted to fire as deeply as did the USFS.

Suppression did become the keystone of NPS policy. Leaders divided the park system into different categories. Large western parks, usually in the proximity of national forests, always had been the center of thinking about fire. With the threat of major fires ever present, parks such as Glacier, Sequoia, Yellowstone and Yosemite implemented more widespread suppression programs than ever before. CCC camps spurred the process. In 1933, five camps at Sequoia, five at Yosemite, nine at Glacier, four at Yellowstone, and three at neighboring Grand Teton National Park attested to the importance of fire protection.¹⁶¹ With direct instructions to use CCC resources to enhance suppression, the western parks finally had the resources they needed to mount extensive programs.

¹⁵⁹ Elers Koch, "The Passing of the Lolo Trail," *Journal of Forestry* 33 2 (1935), 98-104; Elers Koch, *Forty Years a Forester, 1903-1943* (Missoula, MT: Mountain Press Publishing Company, 1998), 91-107; Pyne, *Fire in America*, 278-82; Stephen Pyne, *Year of the Fires: The Story of the Great Fires of 1910* (New York: Viking Books, 2001), 264-66.

¹⁶⁰ Pyne, *Fire in America*, 272-75.

¹⁶¹ *Directory of CCC Camps Supervised by the National Park Service (Updated to December 31, 1941)* (Washington, D.C.: Government Printing Office, 1942), 1, 4, 7.

The results of the CCC presence and the increased emphasis on planning were almost immediate. The northern plains experienced the same declining precipitation that prompted the Dust Bowl to the south, and by the mid-1930s, conditions were drought-like. From 1933-1935, Yellowstone experienced acute fire hazards resulting from mild temperatures, below-normal precipitation, and the early melting of snow from the warmer-than-usual conditions. Despite a large number of fires, the park suffered little damage. Some interpreted this as the triumph of fire control, for Yellowstone passed a critical test. The new infrastructure and increased resources prevented a replay of past bad fire seasons, proving Coffman correct and tempering Superintendent Roger Toll's pleas for vigilance. During 1933, more than 800 men worked on fire protection projects that included reforestation, clean-up, and road, trail, bridge, and telephone line construction. In 1934, six CCC camps were organized for fire emergencies, with the workers divided into "flying squadrons" of fifty fire fighters, with two additional squads of forty each. CCC enrollees were attached to ranger stations to act as smokechasers. "They have been of invaluable aid in this capacity," Toll reported, "and in numerous cases have prevented small fires from increasing to considerable size because of their prompt action, and because of the fact that they were immediately available for fire suppression duty." In 1935, all fire fighting was consolidated under the chief ranger, with responsibility for structure fires moved from the aegis of the master plumber to the ranger division.¹⁶² Fire had new precedence and a coordinated response developed.

The results were stunning, a testimony to the ability of adequate resources to make suppression a successful strategy in specific circumstances. In 1933, Yellowstone experienced thirty-seven fires, the largest of which was 850 acres. In 1934, only nine fires were reported before June 30. All were minuscule. In 1935, the trend continued: the park faced thirty-five fires, only four of which were Class C blazes of ten acres or larger.¹⁶³ In each of the years, Toll had anticipated a severe fire season. Light winter precipitation and dry spring weather made the prospect of fire extremely daunting, but each of the first three years of the CCC program, Yellowstone was able to control the fires it faced.

The difference at Glacier National Park was equally dramatic. Suppression worked so well that until a freak fire on October 4, 1934, the park had kept its net fire loss to less than 100 acres of timber for the year. A combination of the workers from the park's nine CCC camps, more than any other single unit in the park system, and the deployment of smokechasers and lookouts created a near perfect suppression regime in a short time frame. The October 4 fire spread wildly because of unusual circumstances. After a snowfall of eighteen inches, the park released its CCC enrollees. "We were so certain that our fire season was over," Superintendent Eivind T. Scoyen observed in the aftermath, "that we had put away all our fire equipment for the winter." With snow on the ground, rangers began to burn brush, a common fall practice. During one burn on the east side of the park, a "wind of almost hurricane proportions," as Scoyen recounted, spread

¹⁶² Annual Report of the Superintendent of Yellowstone National Park, 1933, 3; Annual Report of the Superintendent of Yellowstone National Park, 1934, 4-5; Annual Report of the Superintendent of Yellowstone National Park, 1935, 5; Circular No. 25, October 8, 1935, Superintendent's Monthly Report, October 1935, Yellowstone National Park Library.

¹⁶³ Annual Report of the Superintendent of Yellowstone National Park, 1933, 3; Annual Report of the Superintendent of Yellowstone National Park, 1934, 4-5; Annual Report of the Superintendent of Yellowstone National Park, 1935, 5.

the flaming material into a crown fire that spread along the North Shore of Sherburne Lake. Bringing men from the CCC camps on the west side of Glacier, Scoyen and his full-time staff quickly brought the fire under control.¹⁶⁴

Other fires at Glacier National Park presented challenges, with blazes during August 1936 proving particularly taxing. A fire on the Glacier Wall on August 18 became a crown fire before it was detected. With the efforts of almost 500 men, it was under control by August 22. A dry thunderstorm on August 22 started ten fires in the park and more in the adjacent national forest. More than 200 workers were dispatched to these fires, 125 taken from the Glacier Wall fire. Two days later, the combination of rain and the addition of 1,200 new workers from the Forest Service put an end to that blaze. A fire discovered August 30, a remnant of the August 18 Glacier Wall fire finding new life, spread. It quickly became three separate fires: one on McDonald Creek, another a few miles north of Granite Park Chalets, and a third near Ahern Pass. The intensity of the fire shocked observers. "I have never seen as complete a burn-out as occurred in Swiftcurrent Valley," Scoyen recorded. "With the exception of a few swampy areas, every green living thing, from rocks on one side of the valley to the other, has been destroyed." The fire leveled all of the park's buildings in the Many Glacier area, three of the chalets across the road from the Many Glacier Hotel and many of the cabins. The hotel was saved because of the efforts of its employees.¹⁶⁵

Many factors contributed to this new ability to fight fire, but the clearest change came from the combination of labor and money. The CCC provided something the park system had never before experienced: an abundant supply of labor. Superintendents at parks with complicated fire histories could direct those resources at fire and came to see the New Deal as the solution to their problems. Toll recognized the impact at Yellowstone, as did Scoyen at Glacier, White at Sequoia, Charles Goff Thomson at Yosemite and many others. Scoyen rated the 1936 fire season as "one of the most dangerous ever experienced" in the northern Rockies. "The entire park organization did a magnificent job during this emergency," he informed Director Arno B. Cammerer. "Everyone, no matter in what capacity employed, willingly and cheerfully worked day and night without any complaint whatsoever, to bring the situation under control." Even Howard Hays of the Glacier Park Transport Company, a friend of the park who was sometimes critical of its operations, concurred. "Considering the unprecedented drought to which the Park has been subject," he told Cammerer, "I feel we have been most fortunate to escape without a much greater loss." As a doctrine, suppression was possible when resources were available. When workers cleared underbrush, built roads, trails, and fire lines, and especially when lookouts with communications were staffed, reacting to fire as Coffman insisted gave the national park system a very good chance of mastering all but the most cataclysmic of fires.¹⁶⁶

One of the greatest coups of the 1920s had been the acquisition of the major national parks, Shenandoah, Great Smoky Mountains, and Mammoth Cave, in the eastern half of the United States. Far more heavily visited as a result of proximity to so much of

¹⁶⁴ E.T. Scoyen to the Director, October 11, 1934, NARA, RG 79.7., Glacier National Park.

¹⁶⁵ E. T. Scoyen to Director, September 10, 1936, Howard H. Hays to Arno B. Cammerer, September 7, 1936, NARA, RG 79.7, Glacier National Park.

¹⁶⁶ J.D. Coffman, Memorandum for the Superintendent, Sequoia National Park, August 6, 1933, Sequoia National Park. F275, F2.

the nation's population, eastern parks presented a different set of challenges in responding to fire. The humid nature of the region stood in contrast to the aridity and lack of water so common among the western parks. Fires were endemic because of human behavior. The combination of visitors and long-standing patterns of local use, some of which included seasonal burning, made such parks vulnerable not only to the carelessness that marked national park visitors across the country, but also to intentional fire-setting. National Park Service officials attributed the increase in number of fires during the 1930s to the creation of eastern national parks.¹⁶⁷ These situations mirrored the problems of Yellowstone and Yosemite in the late nineteenth century. In such places, local residents continued patterns of use after the establishment of the parks, burning in a casual manner that defied suppression efforts.

At Mammoth Cave National Park in Kentucky, authorized in 1926, but not established until 1941, the National Park Service faced the problem of fire from a new perspective. Unlike western parks carved from public lands, Mammoth Cave and the other eastern parks had to be bought, parcel by parcel, from private landowners or obtained by cajoling, negotiating, or exchanging with state, county, and local governments. At Mammoth Cave, two associations purchased land for the park throughout the 1930s. Before formal establishment, the National Park Service took administrative responsibility for the lands that were to be included in the park. This long and often drawn-out process left the Service with vast and scattered holdings that were hard to manage and even more difficult to consolidate. In essence, throughout the period between authorization and establishment, the National Park Service invariably managed a patchwork of land interspersed with parcels of private, state, and county lands.

Mammoth Cave had a different pattern of fire than did most of the parks in the system. Fires occurred in its vicinity in winter, with many just outside park boundaries and even more on private parcels inside the proposed park. Fires on private land within the park boundary required a Service response. NPS officials worried that such fires might spread and damage the park, and in any event, they expected eventually to acquire such lands. If it aggressively battled fire, the National Park Service also stood to gain friends in an area where it was resented. With the CCC available for fire fighting and protection work, the National Park Service stood to benefit from any fire protection efforts in more than one way.¹⁶⁸

Eastern parks such as Mammoth Cave highlighted the benefits of using a cooperative approach to fire response. The laudable goal of fire protection beyond park boundaries became an objective in large part because the CCC provided enough resources to contemplate it. Since early in its history, the National Park Service recognized that response to fire should extend beyond park boundaries. In the West, examples of interagency cooperation abounded; rangers and park staff fought fires on

¹⁶⁷ Cook, "Forest Fire Protection in the National Park System, 1930-39," 3; Durwood Dunn, *Cades Cove: The Life and Death of an Appalachian Community, 1818-1937* (Knoxville: University of Tennessee Press, 1989); Warren Hofstra, *The Planting of New Virginia: Settlement and Landscape in the Shenandoah Valley* (Baltimore: Johns Hopkins University Press, 2004); Margaret L. Brown, *The Wild East: A Biography of the Great Smoky Mountains* (Gainesville: University of Florida Press, 2000).

¹⁶⁸ "Report on Mammoth Cave, 1937," NA, RG 79.4.3, Branch of Forestry, Forest Fire Reports 1928-1949, Box 2; John Ise, *Our National Park Policy: A Critical History* (Baltimore: Johns Hopkins University Press, 1961), 254-56.

national forest and private lands even as workers from other agencies battled national park blazes.

By 1935, the impact of the New Deal largess on fire response offered the Service a critical choice. The National Park Service could consider a formal policy of extending fire protection beyond park boundaries, effecting fire control in a regional context. Protecting parks from fire meant investing in the management of adjacent lands. The eastern national parks were central to this expansion of obligation. The circumstances at Mammoth Cave illuminated the question. “Due to CCC labor we are in a position to suppress numerous fires outside the park,” observed NPS representative Robert P. Holland, who became Mammoth’s acting superintendent in 1936, “and thereby assist our fire prevention program by making local people fire conscious.” Common enough at other parks, such a policy promoted the agency’s objectives at Mammoth Cave. Coffman concurred. “If it is necessary for the NPS to fight all fires with the maximum boundary in order to afford proper protection to the area within the minimum boundary, and there is no other agency who can be looked to for efficient protection,” he wrote, “then I feel the maximum boundary constitutes the park’s protection boundary.”¹⁶⁹ In the East at least, the National Park Service served the function of the Forest Service, in the West, as the dominant fire response and control agency.

By the end of the decade, the National Park Service had pulled back from this perspective. Experience showed that even with the CCC, the task often exceeded the resources available. By 1939, Lawrence F. Cook, head of the Western Region of the NPS Division of Forestry, deemed fire-fighting efforts outside of park boundaries as beyond the reach of the Service. “Little or no control over the use of fire on these outside lands can be exerted by the Service,” he observed in his summary of the decade. “Dependence must be placed on the agency responsible for protection of the area.”¹⁷⁰ The National Park Service in the West benefited from the fact that its neighbors were primarily federal. With mostly private or state lands around eastern national parks, the NPS found less assistance in implementing a comprehensive fire control program.

The nation’s first archaeological national park, Mesa Verde, generally experienced few fires. Colorado’s high mesa country offered few opportunities for fire to spread and at 52, 122 acres, the park encompassed a much smaller area than most western parks. In the first twenty-five years of park history, only one fire, the Todd Nine fire in 1926, was considered major. It burned only twenty acres of vegetation, barely reportable by the standards of parks such as Glacier and Sequoia. The park received three CCC camps, which in the summer 1934 housed 1,300 workers. When two fires started in July, the park responded. The first, the Wild Horse Mesa fire, began on the adjacent Ute Reservation on July 9. CCC workers fought the fire and briefly brought it under control. But the fire broke away, spreading rapidly and eventually subsuming the Wickiup Fire, a 286-acre burn that started on July 11. The blazes eventually burned a total of 4,492 acres of timber, 2,229 of which were inside Mesa Verde. More than 1,000 workers battled the

¹⁶⁹ Robert Holland Memorandum, March 26, 1935; John D. Coffman, Memorandum, April 17, 1935, NA, RG 79.4.3, Branch of Forestry, Forest Fire Reports 1928-1949, Box 2.

¹⁷⁰ Cook, “Forest Fire Protection in the National Park System, 1930-39,” 3-4.

blazes, including CCC enrollees, members of the Indian Service, and residents of Mancos, Colorado, and other nearby communities.¹⁷¹

The fire created a new consciousness about the threat Mesa Verde faced, and the CCC camps allowed the park a formidable response. Superintendent Ernest P. Leavitt recognized that the park had been fortunate. The fires on Wickiup and Wild Horse mesas did little damage to park facilities; if similar events had occurred on Chapin Mesa, he noted, Mesa Verde's developed areas would have been ruined. Leavitt emphasized the development of fire-fighting infrastructure. He wanted lookout towers, truck trails, and fire trails to allow the rapid movement of workers and materiel from headquarters to outlying mesas. The CCC and other New Deal programs provided his solution.¹⁷² Again, suppression depended on resources and technology. It had become the National Park Service's only strategy.

Despite its increasing success, the National Park Service's attempt to eliminate fire became a source of consternation for wildlife scientists within the Service. NPS scientists suggested that the Forest Service was clumsy in its approach, its methods heavy-handed and excessive. Under Coffman, some charged, New Deal programs made some national park areas look more like national forests, managed landscapes rather than vestiges of a natural past. In 1935, Adolph Murie, the noted naturalist, challenged existing NPS practice. He believed that clearing a twelve-square-mile area in Glacier National Park as the National Park Service intended was "gross destruction. . . . Removing natural habitat from a national park," he declared, was tantamount to declaring war on the national park idea. Clearing brush and removing dead trees, denuding roadsides to enhance the visual impact of parks, and otherwise altering existing conditions fit older notions of tamed nature, not the pristine nature that so many demanded of the national parks. The rise of wilderness organizations, especially the Wilderness Society, headed by Robert Sterling Yard and Bob Marshall, stemmed from this sense of lost wild as well as from other factors such as the spread of automobile tourism. Some scientists vociferously complained about NPS actions, arguing that such human-induced removal of brush impeded wildlife patterns, altered terrain, and generally disrupted natural cycles.¹⁷³

Suppression proponents such as Lawrence F. Cook blanched at the accusation that his staff had become "destroyers of the natural." National Park Service foresters sought to preserve the "natural values" of parks, eliminating excessive fuel loads and maintaining the easy access that promoted fire protection. A protection regime gave "nature" a better chance of long-term survival, Cook insisted. Without such protection, supporters argued, the National Park Service could not expect to preserve scenic and recreational values or even any semblance of native biology.¹⁷⁴

¹⁷¹ Annual Report of the Superintendent of Mesa Verde National Park, 1934, NARA, RG 79.7, Mesa Verde, Box 1; Paul Rogers, "Mesa Verde Fire History, March 2002," unpublished paper, Mesa Verde National Park archives, Mesa Verde National Park, 5-7.

¹⁷² Rogers, "Mesa Verde Fire History, March 2002," 7.

¹⁷³ Adolph Murie to Ben Thompson, July 13, 1935; Adolph Murie, "Memorandum for Ben H. Thompson, August 2, 1935," NARA RG 79.7, Glacier National Park, Box 973; Paul S. Sutter, *Driven Wild: How the Fight Against Automobiles Launched the Modern Wilderness Movement* (Seattle: University of Washington Press, 2002), 23-53; Sellars, *Preserving Nature in the National Parks*, 128-29.

¹⁷⁴ Lawrence F. Cook, "Memorandum for the Chief Forester, August 28, 1935," NARA, RG 79, Glacier National Park, Box 973; Sellars, *Preserving Nature in the National Parks*, 130.

The difference between the perspectives illustrated a gulf between two disparate ideals of national parks. Murie advocated something resembling a fictive pure nature, a physical world that appeared untrammled to the visitor's eye and satisfied his scientific vision of the concept of natural. Cook argued for a managed scenic landscape, an ideal vista that coincided with the idealized image of national parks that the National Park Service advanced and the public embraced. In a sense, both fit the definition of nature. Both were managed, albeit in different ways, one by action and the other by the consequences of inaction, and both easily fell within the purview of National Park Service logic and vision. Simultaneously both pointed to a different kind of fire management future for the Service.

The debate took place at a pivotal moment in the history of fire management, during which the assumptions of the moment obscured longer-term judgment. Fire loomed large during the New Deal for ecological reasons. After an extended period in which truly major fires were limited to 1910, between 1919 and 1934 five major fire years occurred, heightening concerns and bringing fire to the forefront of planning. The National Park Service experienced these significant outbreaks along with the Forest Service, awakening both agencies to the consequences of cataclysmic fire and challenging them to conceive of their missions in new ways. With adequate resources, suppression appeared to work. The positive responses of NPS superintendents to their new circumstances affirmed the direction in which the National Park Service took fire policy. The result was the argument for Forest Service-like management that Cook and others offered. They advocated suppression because it was the NPS's goal in fire management.¹⁷⁵

Suppression, with CCC workpower, appeared to work. At the same time, an influential countertrend emerged. When George M. Wright, the NPS's first chief of the Wildlife Division, initiated a new plan for wildlife management, the National Park Service had the opportunity to recast its fire response in a manner distinct from the Forest Service. Wright and his growing cadre of wildlife biologists never agreed with Coffman's perspective; they liked his policies even less. The biologists believed that leaving dead timber material on the floor of the forest was healthy for the forest and the wildlife that lived in it. *Fauna No. 1*, the first wildlife policy directive the National Park Service issued, advocated preserving the forest as it was, letting natural processes drive any changes in ecology. Coffman's forestry model, extending protection throughout the national parks, attempted to protect them against not only fire, but insects, fungi, and other threats. Wright's model suggested a dynamic forest, ever-changing; Coffman's conceived of a forest frozen in ecological time. The latter remained attractive in no small part as a result of the looming threat of major fire and the success of suppression at the major parks. Following the Forest Service, which controlled the money available for fire protection, the National Park Service hired foresters instead of plant biologists or botanists to manage its fire programs, consigning scientists to the narrow realm of plant and wildlife management. Wildlife biologists found themselves alone as advocates of ecological management as the foresters continued to follow USFS practices.¹⁷⁶

¹⁷⁵ Pyne, *Fire in America*, 255-56; Pyne, *Year of the Fires*, 253-67.

¹⁷⁶ Sellars, *Preserving Nature in the National Parks*, 126-28.

The human resources of the CCC created a confidence in the National Park Service, a sense that it could face and defeat fire. With its embrace of suppression, the National Park Service also adopted another USFS idea, that nature could be shaped and controlled by human endeavor. This precept was more complicated for the National Park Service than for any other federal land management agency. With its tacit value that nature was to be preserved within its boundaries, the National Park Service outwardly embraced the idea of nature preservation even as it developed tourist facilities in national parks and made other significant accommodations for visitors. Fire suppression was not incongruous with the Service's vision of nature protection, for it preserved a vision of a pristine, pre-human America. A nation filled with forests surely greeted the first European settlers, American mythology announced with certitude, and fire suppression protected the very trees that attested to this complicated historical fiction. At the same time, the results of suppression provided a tacit justification of the means. Different in that they contained diverse species of trees instead of the monoculture of USFS planting, the national park area forests cleared of brush and understory in the Forest Service style, allowed trees to remain and let the National Park Service deploy its newly found resources to respond to fire away from heavily traveled areas. The National Park Service could suppress fire and defend nature with only a modicum of discomfort about the contradictions such a formulation contained.

Although a number of other factors clearly contributed to this positive record, the prevailing thinking about fire management pointed directly at the resources available for suppression. NPS circulars began in 1934 and became more focused on fire fighting and forest conservation after 1935. In 1936, Coffman added the CCC-funded NPS state parks program to his responsibilities. That same year, the Branch of Forestry initiated a review of each park's fire-fighting program. Specialized training for CCC enrollees became common. The idea that fire could be contained through proactive strategies became such a dominant ideology that when Cook later assessed the decade, he drew stark and clear contrasts. "Prior to 1928," Cook observed, "little training or planning for fire protection had been done. As a result, large acreages were burned. . . . With the advent of the Civilian Conservation Corps in 1933, much more rapid strides have been made in completing the most needed physical improvements for protection."¹⁷⁷ This perspective became the baseline National Park Service view, one that tied it to the Forest Service and the vast resources that National Park Service commanded for fire-fighting and protection and that marked the Service's cosmology and point of view.

The National Park Service's preventive fire protection became more aggressive, necessitating greater levels of organization. The presence of the CCC put considerable pressure on parks, for some of the activity undertaken by the ECW program conflicted with park goals. In some instances, park officials had to contend with overaggressive enrollees removing or cutting more than the National Park Service wanted. Because of the vast number of people working in most national parks and the confusion about what they were supposed to do and how they were supposed to do it, a clear set of guidelines

¹⁷⁷ L. F. Cook, "Forest Fire Protection in the National Park System, 1930-1939," Occasional Forestry Note No. 5, March 25, 1940, Department of the Interior, National Park Service, Sequoia National Park Archive, SNP 42, Box 275, Folder 2.

became necessary. Coffman developed principles to guide NPS fire protection. He approached the idea with his characteristic thoroughness and clear-headed thinking.¹⁷⁸

The circular Coffman authored to direct CCC efforts offered a scientific approach to managing ground cover that contributed to fires. Coffman insisted that he covered only “dead vegetative matter from the standpoint of fire hazard reduction giving due consideration to the requirements of aesthetics and wildlife.” This definition resulted from the increasingly vocal complaints of wildlife biologists and the avid work of CCC enrollees, whom the National Park Service often took to task for not differentiating between dead and living material. Coffman recognized that such work should be overseen by trained foresters, but knew that such specialists were in short supply. Direct administration fell to forest technicians, who Coffman insisted had to be concerned with “furthering the objectives of wildlife and landscaping.”¹⁷⁹

Coffman designed the instructional circular to create a common understanding of obligations and the terminology that defined them. He intended to describe conditions and to establish standards for management that could be applied to fire protection activities. “Debris on the ground is a natural condition in all forests,” he wrote in a section entitled “Limitations.” “Unfortunately, fire hazard reduction as an ECW project is too often conceived to mean the complete removal and disposal of all dead standing and down material from large forest areas. . . . Fire hazard reduction often serves as an excuse for intensive forest cleanup which is almost invariably ascribable to and governed by an inherent human tendency to tidy up the woods.”¹⁸⁰ This philosophical observation reflected what had become Coffman’s dichotomy, the problem of doing the job so well that it damaged the features the park was meant to preserve.

In the end, such circulars attested to both the success of the program and to the changes it brought to park ecology. When Coffman reminded his charges that complete removal of dead and downed timber was not a primary objective of cleanups and that wildlife and landscape values had to be taken into consideration, he asserted the values of the National Park Service over those he brought from the Forest Service. Fire protection was a crucial activity, but even to Coffman, it was not a precondition of National Park Service objectives in the way that it was for the Forest Service. Despite its embrace of the USFS model, the National Park Service vision of fire differed. It no longer even nodded toward the dissenting point of view that Superintendent John White advanced in favor of light burning. In the same circular, Coffman called light burning a “practice [that] cannot be tolerated in the national parks.” In response to a suggestion from Yellowstone National Park to let remote and valueless timber burn after a summer in which the park lost more than 25,000 acres of timber to fire, Coffman responded with a firm articulation of NPS policy. “I for one do not concur with any such policy for the national parks and monuments,” he announced. “There are extremely few areas where any fire starting is not a threat to high values.”¹⁸¹ NPS fire policy did not demand the sanitized forests that the National Park Service attributed to its chief rival. National parks were to look like nature

¹⁷⁸ Coffman interview, October 29, 1962, 19.

¹⁷⁹ Miscellaneous Circular No. 15 for Western Parks and Monuments, December 17, 1934, FR 31-34, Man U, Box 2, F20, Sequoia National Park, 1-2.

¹⁸⁰ Ibid. 4-5.

¹⁸¹ Ibid., 2; Superintendent’s Annual Report, 1940; John D. Coffman, Memo to Regional Director, Region II, November 8, 1940, 883-03.3, Y-240, Yellowstone National Park.

and be free of fire. In many ways, accomplishing these ends was a more difficult assignment than simple fire eradication.

CCC enrollees proved less compliant than Coffman hoped and his message had to be repeated throughout the remainder of the decade. Coffman and others in the National Park Service repeatedly issued rules to govern CCC actions and to affirm National Park Service oversight and responsibility. Even under National Park Service supervision, the CCC sometimes lacked the subtle touch that Coffman and the National Park Service sought. The crews often cleared indiscriminately, a valid response to both their training and to the USFS model from which it derived. The National Park Service sought a better balance between clearing and landscape and wildlife values. In this respect, the CCC became a liability as well as the tremendous advantage it certainly provided. The National Park Service had to grapple with the embarrassment of riches ECW programs offered. In fire management, officials learned that an abundance of resources did not always yield the precise results they sought. The CCC drove fire control as much as fire control directed the CCC.

The National Park Service's language during this era contributed to the confusion. Fire plans typically were aggressive in articulating their intent. "The fire control plan recognizes no Sundays, holidays, or 8-hour days or shifts," Grand Teton National Park's 1939 fire plan enunciated. "When a fire is discovered or reported, immediate action is demanded, and control and patrol measures must be continuously applied without interruption until the fire is out." At Grand Canyon, the park's policy reflected similar objectives: "to reach and combat every fire that starts in the park, or that threatens the park, with such speed, skill, strength, and equipment as to confine it to the minimum of acreage burned and damage caused."¹⁸² Despite some complaints about overly enthusiastic CCC enrollees, fire suppression remained the lexicon of the National Park Service.

The most permanent dimension of the impact of resources was the degree of organizational structure it permitted. Before 1933, fire response had been a matter of quick action by anyone who was available. With New Deal resources, the National Park Service now had trained people and dedicated materials that it could deploy in a strategic fashion. The burgeoning communications networks in the national parks, combined with the many fire lookouts, allowed for a level of planning that extended far beyond the theoretical response of the 1920s. The New Deal changed the nature of fire plans. They became comprehensive documents that described leadership, responsibilities and strategies, while allocating resources and considering contingencies instead of general statement of goals. In some ways, the fire plans were draconian: in an age when cigarettes were ubiquitous, Grand Teton's document forbade smoking during fire season except in prepared camps and designated places. Grand Canyon's plan permitted the park superintendent to draft visitors to help fight fires.¹⁸³

With infrastructure provided by access to resources, the NPS facilitated a series of cooperative arrangements with adjoining national forests that extended the cooperative fire protection that began in the 1920s. Fire forced agencies into alliances and these

¹⁸² "Grand Canyon National Park, Fire Control Plan, Season of 1939," 1; "Fire Control Plan for Grand Teton National Park, 1939," 2.

¹⁸³ "Fire Control Plan for Grand Teton National Park, 1939," 4-5; "Grand Canyon National Park, Fire Control Plan, Season of 1939," 2-3.

relationships became a hallmark of the New Deal. U.S. Forester William Greeley became the primary advocate of cooperative fire protection. Even before he left office in 1928, structures such as the Forest Protection Board that supported interagency responses were in place. The New Deal provided a greater degree of centralized control, which affected all kinds of agencies, not just federal land managers. Most national parks had created relationships with other federal land management agencies. Although such agreements had existed since the 1910s, Yellowstone's 1932 agreement with the Absaroka National Forest served as a model. Before the New Deal, the two agencies were both short of resources and they essentially agreed to pool what they had. "Overhead will be loaned to adjacent units insofar as practicable," the agreement read, "without endangering the unit loaning the overhead." Both agreed not to charge each other for anything more than expenses, to deputize members of the other agency when necessary, and to share law enforcement obligations.¹⁸⁴

The preponderance of resources had changed the nature of such agreements, enhancing their significance and pointing toward comprehensive regional planning. A 1936 agreement between Glacier National Park and the Blackfeet Indian Agency created a "mutual purpose in aiding one another in suppressing all fires as soon as possible with whatever means that may be at hand." At Grand Canyon National Park, a 1939 agreement conceded that the boundaries between the two agencies were artificial and emergency responses could transcend jurisdiction. "Division lines will not be closely drawn," the document attested. "It is to be understood that there shall be no delay by either organization in going to a fire when there is a question as to which side of the boundary the fire is on." The first crew to arrive was expected to provide the initial response, its leader to serve as acting fire boss until the arrival of the lead person from the agency with jurisdiction. At Yellowstone, a new agreement with the Shoshone National Forest in 1938 extended the park's cooperative arrangement into similar terms.¹⁸⁵

By the end of the decade, the National Park Service had developed a clear and distinct set of strategies for addressing fires. CCC resources had been a basis, but the National Park Service had learned much more. Service officials relied on leadership at the park level to emphasize the importance of fire response, argued vociferously for careful assessment of fire experiences and for continuous updating of fire protection planning, collected data about the sources and causes of fires, and recognized the value of frequent training for everyone involved in the fire protection system. By 1939, the National Park Service had anticipated the end of the CCC. Superintendents were admonished to develop new sources of fire fighters in local communities and beyond. "The Service has an enviable position among agencies responsible for fire protection in that practically all the users of the parks are contacted directly by protection personnel," observed Lawrence Cook, a bit optimistically. "We have a wonderful opportunity to advance fire protection not only for our own areas but also in the general field of fire

¹⁸⁴ "Fire Cooperation Agreement Between Yellowstone National Park and Absaroka National Forest, June 13, 1932," W-238, Yellowstone National Park.

¹⁸⁵ R. R. Vincent to Director, August 11, 1936; "Cooperative Agreement," (ca. 1936), NARA, RG 79.7, Glacier National Park, Memorandum to Field Officers A-17-1, Cooperative Fire Fighting Agreements, December 17, 1938, NARA, RG 79.4.3, Branch of Forestry, Box 281; "Fire Cooperative Agreement: Kaibab National Forest Service-Grand Canyon National Park," Grand Canyon National Park.

prevention.”¹⁸⁶ The National Park Service not only saw its experiences with fire as valuable, it also believed its educational mission could be used to support the goals of suppression.

Cook also recognized that completely preventing human-induced fires was impossible. “The Service, perhaps, cannot expect 100 percent elimination of man-caused fires despite all that we can do, although our efforts should be pointed in that direction,” he summarized. “Any park can well be more proud of a record of reduction of preventable man-caused fires than in a reduction of area burned.”¹⁸⁷ This differentiation attested to the lessons that the National Park Service had learned. Prevention was good, but control was essential. More than any other idea, this subtle shift enunciated the differences between the National Park Service and the Forest Service. The primary threat to the parks remained the actions of people.

The initiation of hostilities in World War II changed the climate in which National Park Service fire management took place. From 1941 to 1945, the war took men and materiel away from civilian purposes, directing it toward defense efforts. The National Park Service did not escape unscathed. The Service’s budget was cut in half in the aftermath of the attack on Pearl Harbor on December 7, 1941. Between that date and the end of the fiscal year in June 1942, the National Park Service lost almost 25 percent of its permanent workforce. A year later, the number had fallen again, from 4,510 in 1942 to 1,974 at the end of June 1943. It dropped to 1,577 by 1945. The CCC was disbanded in 1942; most of the young men who worked in it went on to the military. The situation became so dire that the Service relied on camps of conscientious objectors to open and maintain trails for visitor use and fire protection in Glacier National Park. The National Park Service moved from its Washington, D.C. headquarters to Chicago and slipped into an inconsequential role as the war effort demanded more and more of the budget and the nation’s resources.¹⁸⁸

Fire presented a different kind of threat in wartime. “To the normal problem of fire protection,” NPS Director Newton B. Drury wrote in his 1943 annual report, “an acute threat of sabotage and enemy incendiaryism was added.” Areas of extreme fire hazard within 300 miles of any coast were included in the fire protection allocations of national defense agencies. The National Park Service contributed to the war effort in every way that it could; its contribution often extended to cooperating in fire fighting and in some cases, investing NPS resources in larger fire protection efforts. Labor shortage

¹⁸⁶ Cook, “Forest Fire Protection in the National Park System, 1930-39,” 9; Arno B. Cammerer, Director, “The National Park Service,” in U.S. Department of the Interior, *Annual Report of the Secretary, 1940* (Washington, D.C.: Government Printing Office, 1940), 191-93.

¹⁸⁷ Cook, “Forest Fire Protection in the National Park System, 1930-39,” 10.

¹⁸⁸ Department of the Interior, *Annual Report for the Fiscal Year Ending June 30, 1939* (Washington, D.C.: Government Printing Office, 1939), 273-74, 296; Newton B. Drury, Director, “Report of the Director of the National Park Service, 1943,” in Department of the Interior, *Annual Report of the Secretary of the Interior, 1944* (Washington, D.C.: Government Printing Office, 1944), 207-08; Paige, *The Civilian Conservation Corps and the National Park Service, 1933-1942*, 132; Lary M. Dilsaver and William C. Tweed, *Challenge of the Big Trees: A Resource History of Sequoia and Kings Canyon National Parks* (Three Rivers, CA: Sequoia Natural History Association, 1990), 159-67.

allowed women serve as fire lookouts, a task like so many others typically reserved for men prior to the outbreak of hostilities in 1941.¹⁸⁹

The war also increased military use of the parks, providing a faint echo of the Army's earlier involvement in national parks. Instead of protection, their purpose now was largely recreation, as Drury noted in 1943 in his famous plea to maintain protection of the national parks. National parks functioned as emblems of Americanism, he argued, embodying ideals for which the nation fought. This symbolic role elevated the national parks' significance and made their protection even more essential. "Their proper protection in wartime is a responsibility of the first magnitude," Drury insisted in his annual report.¹⁹⁰

Although fire management suffered during World War II, the consequences were not as dire as anticipated. The war may have taken resources from the national park system, but it simultaneously impeded opportunities to travel. A dramatic decline in visitation, in no small part the result of gasoline and tire rationing, meant a primary cause of park fires – careless people – was in equally short supply. Even the influx of soldiers and sailors did not counteract the decline in visitation. In one astonishing example of the shift, the 1941 Clarke-McNary Act report for Arizona showed seventeen national park areas with more than 1 million acres of forest and no reportable fires. The list included Boulder Dam National Recreation Area, Grand Canyon National Park, Organ Pipe Cactus National Monument, and smaller areas. A bizarre parity existed: the National Park Service no longer had the ample resources of the decade before, but neither did it experience high levels of visitation. Fire disappeared as the number of visitors diminished, confirming something that park officials noted all the back to the era of the cavalry in the nineteenth century: ongoing fire stemmed from human action with form consistency. In 1943, only 308 fires were reported in the entire park system, a level 23 percent below the average of the previous decade.¹⁹¹ A number of those were spotted by wartime volunteer lookouts, some of them women. In essence, the NPS receded from the vision of the 1930s, that it would fight fire anywhere it found it, and returned to an earlier vision of battling only proximate fire.

Still, the Service's ideology remained constant. Suppression remained the goal of the National Park Service and it still successfully battled fire wherever it found it, with whatever resources it could muster. No shift in perspective accompanied the diminished resources, leaving the National Park Service with home guard-like skeleton fire crews to guard vast expanses. Federal land management agencies followed national trends, recruiting older men and some women to replace those who went off to war. The NPS even considered using Japanese internees as fire fighters, but found insufficient numbers of men, because most of the people in the age group for fire fighting had already volunteered for the war. For the most part, the replacements lacked the "experience and training desirable for most of these positions." The National Park Service and the Forest Service shared workers as well. The "excellent fire programs" that Region II Regional

¹⁸⁹ Newton B. Drury, Director, "Report of the Director of the National Park Service, 1943," in Department of the Interior, *Annual Report of the Secretary, 1943* (Washington, D.C.: Government Printing Office, 1943), 207-08.

¹⁹⁰ Newton B. Drury, "The National Parks in Wartime," *American Forests* (August 1943), 37-42; Drury, "Report of the Director of the National Park Service, 1943," 207.

¹⁹¹ Memorandum for the Director, January 24, 1942, Grand Canyon National Park Archive; Newton B. Drury, Director, "National Park Service," in *Report of the Secretary of the Interior, 1944*, 223.

Director Lawrence C. Merriam observed at Yellowstone and other parks served as the best form of training. They paid “big dividends,” Merriam noted, providing an essential component of park response.¹⁹² Experienced observers could be forgiven thinking that they had landed in the 1920s: the limits imposed by war were so great as to mirror the uncertainties of that earlier time.

The national parks rarely suffered major fire during World War II. Despite a prominent fear of “enemy incendiarism,” the threat of enemy bombers or balloon-borne incendiaries igniting massive forest fires never materialized. Restrictions and rationing limited travel; shortages of gasoline and rubber tires made remote national parks hard to reach. Overtime work provided plenty of money to civilian workers, but took the time that some might have used to travel to the national park system. As a result, human-induced fires diminished in number and the remaining park crews, as lightly staffed as they were, did the best they could under the constraints they faced. The National Park Service tried to scatter experienced fire fighters among less practiced ones, hoping for leadership in fire situations. Even as the Forest Service adhered to the 10:00 am policy, its leaders recognized that “an acute manpower shortage will probably make it impossible to put this policy universally into effect,” the regional forester for the northern Rockies, C. N. Woods, told Yellowstone Superintendent Edmund Rogers in 1942. “We will have to take more chances of a given fire getting out of control than if we had unlimited manpower with which to attack it.” The constraints of wartime were ominous. The attempts to respond were typically innovative, but other than the diminished number of reported fires, the results remained difficult to assess.¹⁹³

By the time the war ended in 1945, the CCC and its resources were a distant memory. Region Four Director Owen A. “Tommy” Tomlinson recognized the impact. “For the first time since 1932,” he informed his superintendents in 1946, “the agencies handling forest fire protection will not be able to call upon organized mass labor such as the CCC [and] the armed forces.”¹⁹⁴ This was a new reality, he instructed his charges, a shift back to the early days of suppression. Tomlinson asked that his staff do more with less, precisely how the national park system functioned before the New Deal. Suppression remained a powerful intellectual model of response to fire for the National Park Service. The realities shifted back toward a replica of an earlier time.

The New Deal and its resources changed the National Park Service in many ways, and the ability to address fire reflected a prominent improvement in the Service’s ability to fulfill its functions. Suppression had been an ideal; the CCC and its workpower, the millions of dollars from public works programs, and the addition of fire specialists to the National Park Service combined to inspire confidence in its model. With enough resources, suppression worked. Parks faced and fought fires and were able to minimize

¹⁹² “Special Report, Law Enforcement Conference, Forest Service Remount Depot, Huson, Montana, March 3 to March 12, 1942,” Yellowstone National Park, W-1; Carl G. Kruger to Superintendent, Yellowstone National Park, April 9, 1943, Yellowstone, Y-232; J. S. Veeder to Colonel R. G. Walters, July 24, 1943, Hugh H. Miller, “Memorandum for the Assistant to the Secretary in Charge of Land Utilization, March 7, 1945,” Yellowstone, Y-232; Lawrence C. Merriam, “Memorandum for the Superintendent, Yellowstone National Park, April 7, 1943,” Yellowstone, Y-230.

¹⁹³ “Report of Interagency Committee No 1, 1942,” NARA, RG 79.4.3, Branch of Forestry, Box 3; C. N. Woods to Edmund B. Rogers, March 13, 1942, Yellowstone, Y-232.

¹⁹⁴ Memorandum for all Region Four Areas, February 27, 1946, Sequoia National Park Archives, Box 275, F2; “Special Report: Law Enforcement Conference, 1942,” 1.

their impact, except in the most dramatic of circumstances. Even if cataclysmic fire remained beyond the Service's reach, ordinary day-to-day fires and most extraordinary fires could be controlled without terrific damage. As a result of the New Deal, fire seemed to become one more natural force that human ingenuity subdued.

This vision, of an orderly intact nature managed by humans, reflected the stance of the foresters in the National Park Service. It also coincided with the views of landscape architects, who remained the driving force in the Service. This neatly manicured version of nature contrasted with the messier ideal held by wildlife biologists and other scientists. The foresters' vision held sway even as the signs grew that the success of suppression was only temporary. In the post-war era, the tension between these two perspectives accelerated, highlighted by new experiences with fire within the park system.

Chapter 4:

Ecology and the Limits of Suppression

The end of World War II inaugurated a new era for the National Park Service, one of unexpected growth and precipitous change. The enormous increase in the number of travelers and their desire to experience the national parks pulled the NPS from its historic moorings and compelled the Service to envision new ways to manage its holdings. The demands on the park system changed. Postwar prosperity allowed Americans to satisfy their pent-up desire for goods and new experiences. As car ownership became commonplace and leisure time widespread, many sought outdoor adventures. Beneficiaries of a revolution in expectations, access, and affluence, Americans visited the parks to see their country, feel its power, and ultimately to understand themselves and the powerful nation they had become.

Such behavior was part and parcel of a larger transformation of U.S. culture and society. Almost everything about the nation – from race relations to recreation – changed as a result of the war. The victory over fascism carried in its wake a transformation of American society. A new optimism swept the nation; many believed that life would get better for everyone. Indeed, evidence to support this idea appeared everywhere. The position of African-Americans changed dramatically, first in symbolic ways such as the integration of major league baseball in 1947, then in more substantive moves such as the integration of the military in 1948, and later in the law with cases such as the Supreme Court’s 1954 *Brown v. Board of Education* decision, which declared “separate but equal” education facilities illegal. Federal home loan legislation made homeowners out of renters; veteran benefited from the G. I. Bill. Americans bought houses by the thousands in new suburbs such as Levittown on Long Island, N.Y., achieving the American dream of home ownership. Observers at the time noted that everyone in the nation seemed to have raised their aspirations.¹

These trends contributed to the democratization of American attitudes about nature and the revival of the Progressive-era concept of conservation, albeit in a new form. Conservation had been a prominent social sentiment early in the twentieth century and the New Deal that began in 1933 had enhanced public sentiment that favored the idea, but the role of federal work programs changed the meaning of the concept. Instead of being a reflection of ideas about nature and its protection, conservation became shorthand for available work. During the New Deal, conservation became labor policy, dependent on federal dollars to drive the process. The war brought that model to a halt, consigning the principle of saving for the future to the status of afterthought. By 1945, “conservation” meant one thing, while “conservationist” indicated quite another – the amateur, upper crust tradition of the early twentieth century handed down among American elites. Divorced from politics and policy making, individual conservationists

¹ Eric Goldman, *The Crucial Decade – and After: America, 1945-1960* (New York: Random House, 1960), 4-5, 12-15; James T. Patterson, *Grand Expectations: The United States, 1945-1974* (New York: Oxford University Press, 1996), 61-65.

had influence but rarely exercised it. Conservation had become a philosophy that belonged mostly to American elites.²

The post-war era encouraged greater appreciation of American nature by a broader cross-section of the public. Recreation played a crucial role in this expansion of perception. After World War II, the traveling public expanded in numbers and breadth, and its members' expectations reflected a different ethos. The prosperity generated by the war gave more of the American public an opportunity at the perquisites of the good life, and the constituency for vacation-type travel increased immensely in size. Within a few years of the war's end, many Americans enjoyed greater disposable income and paid vacation time. A combination of affluence, accentuated by heightened demand for leisure after more than a fifteen-year period in which amenities were not available, and new fashions that stressed a wider intellectual and conceptual vision of the world as part of the pleasures of middle class life, heightened the meaning of American nature. Most Americans still defined themselves in terms of the national relationship to the physical world. With the means to consummate that relationship, they ignited a revolution in travel patterns, and in the aftermath of the war, millions of Americans went to see their national parks.³

Much of this travel occurred by automobile, the personal conveyance that promised individual freedom and authentic experience. After 1945, automobile ownership, an impossible dream for most during the Depression, evolved into a badge of middle-class status. The demand for recreation in national parks soared so high that the Park Service could not keep pace. Not only were available campsites scarce but existing campgrounds were covered with uncollected garbage, debris from timber illegally cut for firewood, and other eyesores. The National Park Service recognized the prospect for post-war demand even before World War II ended, and Superintendent John White at Sequoia offered a peculiarly poignant observation of the conditions that ensued. "In the national parks, we have always been in the position of engineers compelled to dam a stream without opportunity to divert the flood waters," he observed in his 1947 annual report. "It looks as though we must hope for another depression to help the National Parks. Despite our best efforts, our public camps are run down, our scenic spots improperly protected, our park buildings and all facilities inadequately maintained, and the public neither protected nor advised, nor educated." Others soon echoed White's trenchant sentiments. In response to what he regarded as a landscape destroyed, noted author and iconoclast Bernard DeVoto recommended closing the national parks if they could not be better managed. The rapid increase in automobile ownership and the driving vacation had strained the limits of the park system.⁴

² Stephen Fox, *John Muir and His Legacy: The American Conservation Movement* (Boston, Little, Brown & Co, 1980), 333-57; Adam Rome, *The Bulldozer in the Countryside: Suburban Sprawl and the Rise of American Environmentalism* (Cambridge: Cambridge University Press, 2001), 1-13, 119-24.

³ Hal K. Rothman, *Devil's Bargains: Tourism in the Twentieth Century American West* (Lawrence: University Press of Kansas, 1998), 202-05.

⁴ Superintendent's Annual Report for Sequoia National Park, 1947, Sequoia National Park, Superintendent's Files, 2; Bernard DeVoto, "Let's Close the National Parks," *Harper's Magazine* CCVII (1953), 49-52; David Clary, *Timber and the Forest Service* (Lawrence: University Press of Kansas, 1986); John Jakle, *The Tourist: Travel in Twentieth-Century North America* (Lincoln: University of Nebraska Press, 1985), 185-98

Automobile tourism typically took place between Memorial Day in late May and Labor Day in early September, the classic boundaries of summer, when children were out of school, days were long and warm, and families could spend time together. Two days before Memorial Day weekend, tourist camps and motels sat vacant; two days after Labor Day, the cacophony subsided and they returned to silence. The chaos started so quickly and ended so abruptly that it mirrored the traits of vacationing that emerged in television cartoons such as *Yogi Bear*, the story of a madcap bear who inhabited Jellystone Park and gave both the mythic Ranger Smith and park visitors fits. Auto usage created clear patterns of travel and behavior. Tourists went everywhere and anywhere, purchased enormous quantities of food, gasoline, and other staples, filled motels and hotels, and generally kept moving, staying only an insignificant length of time in all but one or two of their stops. A chaos of auto travel existed, in which tourists traveled the mythic landscapes of the West without seeming rhyme or reason, staying only where they landed at the end of a day.

As they vacationed in growing numbers, exemplified by the new highs for visitation set at Grand Canyon National Park each summer month after August 1945, these new visitors to the nation's parks had an impact on the natural world that soon caused the visitors themselves to take notice. What Americans found in many of their national parks and forests shocked them. Growth in western cities as a result of the war brought millions more people into proximity to the most stunning attributes of American nature, and their demands for vacation homes, electricity, water, and roads made a visible dent in forests and crowded the banks of rivers, lakes, and oceans. Clear-cutting of forests adjacent to highways in particular drew public attention to questions of the management of American nature. Convinced of the efficacy of technological solutions to all problems, Americans began to recognize that their actions in the physical world multiplied by their ever-growing numbers had dire consequences for the land that made the nation special.⁵

New patterns of vacation travel almost perfectly coincided with fire season in western parks, bringing together the catalyst for most fire – the carelessness of visitors – and the season in which fires were most likely to start. The NPS encountered more visitors in more places at a time when resources to manage them remained constant or even diminished. In such circumstances, the Service returns to tried and true methods. In fire management, the situation dictated that suppression would be the sole policy goal and that the Service would do its best to react to fires, preserving the bulk of its limited resources for crisis situations. For people such as NPS fire guru Coffman, with two decades in NPS fire management before 1950 and aspirations for a comprehensive system of preparation, this reality was a severe disappointment.⁶ From the aggressive suppression-based posture of the New Deal, the NPS returned to a pattern of making do in its battle against fire.

At the same time, the National Park Service tacitly began to unshackle itself from the Forest Service model that had driven NPS policy since Coffman was hired. The two

⁵ Bernard DeVoto, "The National Parks," *Fortune* XXXV (1947), 120-21; Bernard DeVoto, "Let's Close the National Parks," 49-52; Robert D. Baker, Robert S. Maxwell, Victor H. Treat, and Henry C. Dethloff, *Timeless Heritage: A History of the Forest Service in the Southwest* (Washington, D.C., 1988), 59-68, 131-33; Ronald A. Foresta, *American National Parks and Their Keepers* (Washington, D.C.: Resources for the Future, 1984), 50-55.

⁶ John D. Coffman, "Forest Protection in the National Parks," interview by Amelia R. Fry, 1973 (Berkeley: CA: The Bancroft Library, 1973), 75-77.

agencies continued to grapple over land issues, with one of the first fights coming over the proclamation of the Jackson Hole National Monument during World War II, where the state of Wyoming, federal foresters, and their supporters resented the de facto use of the Antiquities Act. One ranger cabin that was turned over to the National Park Service had been stripped of every interior fixture, reflecting the Forest Service's annoyance. Interagency relations remained uneasy into the 1950s. As visitation numbers grew, the NPS was forced to commit more of its resources to the basic processes of managing visitation. The result simultaneously increased the importance of suppression – for investing resources in visitors necessarily meant that less was available for fire protection and response and increased the importance of being able to detect and extinguish fire – at the same time it changed its purpose. The Forest Service maintained strong fealty to the tenets of suppression. Its sponsorship of fire science culminated in the National Fire Danger Rating System, an effort to standardize the categorization of fire by scientific measures that began in the 1950s and culminated in definitions in 1972, the establishment of three USFS laboratories to study fire, the recruitment of new labor such as the Southwest Forest Fire Fighters, the upgrading of fire crews, and especially the transfer of surplus military equipment to civilian fire protection enhanced its role as the lead fire agency. The National Park Service found it could neither keep pace nor embrace the objective with the same wholehearted enthusiasm. In an era of mechanization, the Forest Service focused on fire protection and suppression. The National Park Service looked elsewhere, investing in the prevention of fires through education and supervision of its visitors.⁷

During the immediate post-war era, important changes in the NPS response to fire began. At Yellowstone National Park, Park Engineer Aubrey Haines, who later earned renown as the park's first historian, completed a "Fire Lookout Evaluation Study" in 1946. Following the Forest Service's model, he researched fire records from the previous decade and pinpointed ongoing trouble spots within the park. Haines recommended a fire-danger map for Yellowstone, a base document to enhance park managers' ability to detect fire and respond to it. Haines's efforts were repeated at other parks. The first NPS Interregional Fire Control Training Conference convened at the Grand Canyon in 1949, bringing together fire personnel from throughout the West. Smokejumpers, front-line firefighters dropped as shock troops to control a fire at its inception, were introduced at Glacier in 1946 and at Yellowstone in 1951. Smokejumping had first appeared in the Forest Service in the late 1930s, and in 1945, NPS Regional Forester Frank Childs recommended that the National Park Service introduce smokejumpers to the northern tier parks. By the mid-1950s, new fire detection technologies were under consideration. In one widely circulated instance, the idea that television cameras would replace human lookouts gained credence. While possible, the idea proved impractical. It cost a great deal and was unreliable.⁸ The emphasis on labor as the primary way to suppress fires continued.

⁷ Stephen J. Pyne, *Fire in America: A Cultural History of Rural and Wildland Fire* (Princeton: Princeton University Press, 1982); Robert Righter, *Crucible for Conservation: The Struggle for Grand Teton National Park* (Niwt, CO: Colorado Associated University Press, 1982), 103-26; Hal K. Rothman, *Preserving Different Pasts: The American National Monuments* (Urbana: University of Illinois Press, 1989), 225-49.

⁸ Aubrey Haines, "Fire Lookout Evaluation Study," Yellowstone National Park files, N-33, 883-02.1, Yellowstone Archives; Frank Childs to Regional Director, Region II, March 3, 1945; "TV Camera Can

Smokejumpers were simultaneously valuable and glamorous. The idea had begun in the Forest Service with David Godwin, an innovative leader and an advocate of technologically sophisticated response to fire. Under the Aerial Fire Control Project, a direct response to the 10:00 a.m. policy, Godwin attempted to drop chemical retardant on fires from the air in the late 1930s. Soon he replaced the chemicals with people, dropping firefighters by parachute in an effort to attain immediate fire control. Smokejumpers touched a nerve in the American public; like Pony Express riders, they faced the unknown with bravery and aplomb. They heightened the already powerful image of firefighters by creating a new cachet, and giving smokejumpers a distinctive swagger.⁹

By the time the first Yellowstone unit was formed, smokejumpers were lionized figures in the battle against fire. Thirteen had died in the Mann Gulch fire in 1949, their deaths later emblazoned on the national stage first by a 1952 movie, *Red Skies of Montana*, and later by the 1992 publication of Norman Mclean's *Young Men and Fire* and the mystique persisted. Following the placement of the first NPS smokejumper unit at Glacier, Superintendent Edmund Rogers at Yellowstone sought one. Rogers tried to interest national forest supervisors adjacent to the park in a joint unit in 1950. They demurred. "With so small a stake in the proposition," Acting USFS Regional Forester Clarence C. Strong noted, "it does not appear feasible to us." The foresters were willing to help the National Park Service create its own units, but were not prepared to split their own force to accommodate individual park needs.¹⁰

The desire for smokejumping units stemmed as much from the dramatic image they projected as from their real utility as tools to fight fires. With NPS running smokejumpers only at Glacier National Park amid the growing proliferation of similar entities in the Forest Service, the addition of such crews at Yellowstone fit the NPS vision of its capabilities as a fire-fighting entity. At Yellowstone, Rogers recognized that the NPS had to consistently grapple with peer agencies for preeminence in the public imagination. It did not serve the NPS to have its premier park perceived as lacking any service provided by a mere national forest adjacent to its boundary, even though smokejumper units were expensive and arguably of only marginal advantage in fighting fire.

The Yellowstone unit resulted from a 1949-1950 Fire Review and Fire Control Replanning Study. In 1949, Yellowstone experienced a difficult fire year. Five large fires dogged the park, forcing reconsideration of existing policy. There were too many shortcomings in the existing strategy, NPS Forester Maynard B. Barrows observed. Yellowstone needed a full-time fire dispatcher when fire conditions threatened a major fire. The report suggested reassigning an assistant chief ranger to the task, but this was a mere stopgap solution. Emergency lookouts were planned, with extra workers on blister rust and trail crews to fill the task. Aerial detection patrols were an important addition, but the study concluded that more training was necessary, and additional prevention measures would clearly help. The park's single greatest need, Barrows wrote, was "the

Spot Fires," *Rocky Mountain News*, July 31, 1955. Haynes trained as a forester, achieving considerable fame for his work as a historian. Despite a lack of formal training, he was the leading historian of Yellowstone National Park throughout his life.

⁹ Pyne, *Fire in America*, 371-73.

¹⁰ Clarence Strong to Lawrence C. Merriam, March 8, 1950, Yellowstone Archives, Box Y-232; Norman Mclean, *Young Men and Fire* (Chicago: University of Chicago Press, 1992); Superintendent's Annual Report for Yellowstone, 1950, Yellowstone National Park.

employment of a plane for aerial detection and transportation of smokejumpers based at West Yellowstone for one month of the year.”¹¹

With the technical assistance of nearby Forest Service units, Rogers built the second smokejumping unit in the NPS. Agency policy dictated that an aerial fire-fighting response was the most effective and the least intrusive, when compared to truck trail construction and other development strategies. Beginning in 1951, the new NPS smokejumpers were trained by the Forest Service at Missoula, Montana, and transferred to the National Park Service payroll during the fire season. At its inception, the Yellowstone unit consisted of only a five-man crew, but it represented a significant upgrade in response time over the previous Missoula-based USFS unit that had fought fires in the national parks and inspired the desire for a separate NPS unit. Rogers wanted to have his smokejumpers based at West Yellowstone for the most dangerous part of the fire season, typically from mid-July to mid-September, more than Barrows anticipated. The park leased a hangar at the West Yellowstone Airfield and let bids for a plane. Cooperation between the USFS and the NPS led to the first smokejumper deployment in 1951.¹²

Yet smokejumping was a sideline for the National Park Service, an emblematic dimension of a larger transition. Much like the flying aces of World War I, who soared as symbols of the glory of conflict above the real mechanized war between millions of men, the smokejumpers reflected the mechanization of firefighting. Aerial fire control – accomplished through helicopters, airtankers, and the aerial delivery of firefighters and supplies – became the dominant mode. Smokejumpers represented the individualized ideal of response to fire, the heroic mythology of preindustrial society translated into a new time. Smokejumpers were valuable primarily as symbols; firefighting had become an institutional operation and technological advances dwarfed even the most heroic exploits of any firefighter.¹³

Yellowstone remained a problem fire park, and others drew wide attention. In 1948, Yosemite experienced its first major fire in almost a decade. The Rancheria Mountain fire began on September 9, discovered by a three-man trail crew at about 1 p.m. They had no communication equipment and were more than eight miles from the nearest telephone. The crew assumed that lookouts would spot the fire and notify park managers, so they battled it as best they could. Lookouts did not see the fire until the next day, when it was reported to headquarters at 10:15 a.m. Beginning in Tulomne River Canyon about two miles downstream from Pate Canyon, a section that was almost 4,000 feet deep and three and one-half miles wide from rim to rim, the prevailing pattern of wind drove the fire upslope, keeping it from rising high enough to be seen by lookouts. Before it was brought under control twelve days later on September 21, the Rancheria Mountain fire burned more than 11,840 acres of timber.¹⁴

¹¹ Forester to Regional Forester, February 17, 1950, Yellowstone Archives, Box Y-240.

¹² “Superintendent’s Annual Report for 1951, Yellowstone National Park,” Yellowstone National Park, Superintendent’s Files, 16; Edmund Rogers to Supervisor, Targhee National Forest, July 10, 1950, Edmund Rogers to Julius Schoener, May 20, 1953, Yellowstone N-33 “Smokejumpers,” Yellowstone Archives, Box Y-232.

¹³ Stephen J. Pyne to Hal Rothman, January 26, 2004.

¹⁴ Board of Review Report, Rancheria Mountain Fire, Yosemite National Park, September 9-21, 1948, 1-3; Yosemite National Park Annual Forestry Report, 1948, 3; Fire Control Plan, January 1949, Yosemite National Park, 1, Fire Records by Year, 1931-1974, Yosemite National Park Archives.

The blaze taxed the park's available workpower. Late in the fire season, it required a response from a quickly assembled force. Park staff already had been reduced to ten temporary rangers, one ranger naturalist, five fire control aides, forty-seven blister rust workers, and seventy maintenance workers. With the small permanent staff, this comprised the park's entire workforce. The National Park Service was able to marshal a combination of seasonal and permanent staff members to fight the fire. Eighteen rangers, three naturalists, three fire control aides, forty-three blister rust workers, and eighty-five members of the maintenance crew manned the fire lines. The Forest Service recruited fifty-five more firefighters in Stockton and brought them to the park. The Yosemite Park Company, Curry Company, state fish hatchery, the U.S. Post Office, city of San Francisco, and the Davis Lumber Company together provided another 153 workers to battle the blaze. On September 16, as the fire began its second week, 220 soldiers from Fort Ord, California, arrived to assist. With the arrival of the military, enough workpower had been accumulated to bring the blaze under control.¹⁵

While the workpower could be deemed adequate, Yosemite had other weak points in its fire protection strategy. The lack of communication equipment loomed large. The telephone line that stretched from Harden Lake to Pate Valley to Benson Lake was perfectly positioned to report the fire. However, the line was out of commission. In 1942, maintenance on the line stopped as a result of a lack of funds and workpower, a direct consequence of the dismantling of the Civilian Conservation Corps. If the line had worked, news of the fire would have reached headquarters two days earlier, significantly accelerating the response. Radio transmission was irregular in the steep valleys of the Yosemite country, where topography and atmospheric conditions made signals undependable. Insufficient scouting on the fire line contributed to an overall lack of knowledge of the scope and size of the fire, and the perennial need for workpower periodically left crucial gaps in firefighting capability.¹⁶ Yosemite's fire protection system needed an upgrade.

A new fire control plan completed at Yosemite the year after the Rancheria Mountain fire articulated the issues. The post-war NPS placed a premium on devising new fire plans that fit the changing realities of the national park system. Following John D. Coffman and the changing circumstances of the Service, revised fire control plans became essential tools in addressing the impact of increased visitation. The park's goals for fire control remained congruent with the rest of the NPS. The 1949 plan reinforced the 10 a.m. policy that the Park Service had followed since the 1930s, sought to confine all fires to the smallest possible area and rearticulated the objective of eliminating all human-induced fires, which comprised the overwhelming majority at the park. In 1948, seventeen of the twenty fires in Yosemite were the result of human action. Clearly, a combination of prevention and education could eliminate much of the fire problem.¹⁷

The 1949 Yosemite plan epitomized the NPS vision of the response to fire. In it, as in nearly everything the Service had written since Coffman arrived in the late 1920s, fire was the enemy and the park's job was to put it out as soon as possible. Yosemite's problems almost perfectly mirrored historical trends in NPS fire management. Its greatest

¹⁵ Board of Review Report, Rancheria Mountain Fire, Yosemite National Park, September 9-21, 1948, 3-4.

¹⁶ Ibid.

¹⁷ Fire Control Plan, January 1949, 2-4.

problem was the behavior of its visitors. They started fires by accident and with intent, and park staff scurried to respond. Detection was a crucial piece of park and Service strategy; once fires were discovered, the weight of the intricate fire suppression network could be placed upon them. When they were not or when communications failed, as in the case of the Rancheria Mountain Fire, the fire grew out of proportion to its genesis and became a significant problem. In the 1950s, suppression reigned supreme at Yosemite and throughout the western national parks. It remained the only philosophy the National Park Service embraced.

If challenged on its strategy, the NPS could point to the success of its suppression programs. Education loomed large: the “remember, only you can prevent forest fires” campaigns of the Forest Service graced the 1950s, and the heavily visited national parks benefited from the wide currency of the notion even more than the larger but less frequented national forests. By 1953, the National Park Service achieved a reduction of almost 50 percent in acres burned, from an average of almost 27,000 acres per annum between 1947 and 1952 to a new recorded low of 14,833 acres in 1953. The trend continued in 1954, with a 4 percent decrease in human-caused fires and a light year for lightning strikes. At the same time, 1953 was among the NPS’s most difficult years for fire fighting. Severe lightning fires in remote areas of Yellowstone and Yosemite, combined with drought-like conditions in the Southwest and California, made vigilance an even more prized commodity. NPS observers noted the importance of the decrease in human-induced fires. Had the previous years’ frequency continued in a year with many lightning strikes, the limited firefighting resources of the NPS would have been stretched thin.¹⁸

The decrease in human-induced fires in comparison to lightning fires changed one significant dimension of the NPS mode: fire could no longer be explained simply as a people problem. The National Park Service had to confront nature as nature, not as human behavior gone awry. Lightning fires had been consistent, but often beyond the reach of park capabilities. Yet with the success of suppression, lightning fires flourished. Human-induced burning had competed with lightning for fuels, burning areas that might otherwise have combusted naturally. As suppression succeeded, fuel loads increased dramatically, and on a small scale, lightning burned more of that fuel. Better detection, particularly by aircraft, brought more of these fires to the attention of the NPS. With new technology, the National Park Service found more fires that would have gone out on their own if no one had seen them.¹⁹ The NPS seemed to have traded one kind of fire problem for another.

As visitation increased in the 1950s, the strain on fire protection resources grew. Even as education diminished the number of human-induced fires, the immensity of the task of stopping fire stunned NPS officials. So many more people came to the national parks every year that numbers offset much of the gain from prevention and education. Technology and innovative ideas helped with response, but no one believed that the

¹⁸ National Park Service, Annual Fire Report, January 1-December 31, 1953, 1-6; Acting Regional Director to Region Two Field Areas, February 26, 1954; National Park Service, Annual Fire Report, January 1-December 31, 1954, 1-3; Regional Chief of Operations to Superintendents, Region Two Areas, March 14, 1955, Office of the Superintendent, Grand Teton National Park, Grand Teton National Park Archives.

¹⁹ Stephen J. Pyne to Hal Rothman, January 29, 2004, copy in possession of the author.

status quo would remain for long. Too many variables, especially the inexhaustible public desire to see the national parks, created ferment within the Service. Even as suppression succeeded, NPS officials worried about the future. By 1954, Forester Lawrence F. Cook couched his appreciation of the Service's suppression accomplishments by pointing to the increase in visitation to a record 47,833,913. In 1955, more than 50 million visitors descended on the national parks; in that year, education and prevention decreased the number of human-induced fires from 247 to 173 in the entire system.²⁰ Cook fairly crowed about the accomplishment. He could be forgiven his palpable pride.

Along with the positive news, a sense of strain simultaneously permeated the annual fire reports. While suppression worked, it continued to attain its goals at the expense of other operational areas at each national park. The annual increases in visitation challenged Service leaders to conceive of other ways to deal with fire. Suppression still reigned over the federal system and the National Park Service. When they looked at longer trends, managers saw the average number of fires per annum gradually increasing, from 356 between 1945 and 1950 to 362 between 1950 and 1955, a trend that pointed to limits in what could be achieved through educating the public. What shocked fire tabulators was that 1956 reported 422 fires, a much larger number than either of the previous clusters. With the decrease in human-induced fires, the only possible cause could be lightning fires. Worse, the continuing increase in visitors suggested that the number of human-induced fires would also increase.²¹ Leaders could not be blamed if, under the weight of dramatic increases in visitors, with the increase in lightning fires, and without a concomitant injection of resources, they feared for their future and pined for another way to address the annual crises that fire caused.

A different vision of the role of fire and the Service's response to it existed, but it came from a region of the country that the National Park Service had not associated with forestry. Everglades National Park offered a counter to the suppression model, but the NPS struggled to integrate this park with its historical vision of fire control.²² Codified in the NPS Fire Control Handbook, a collection of strategies and approaches for administering, finding, and fighting fire, the NPS experience with fire was western in character, shaped in the mountains of California and the inland Northwest at the major fire parks – Glacier, Yellowstone, Sequoia, and others. Despite significant differences in their conditions, they were of a piece. Everglades represented something different, a low-elevation, wet park that biologist Daniel Beard, who became the park's first superintendent in 1947, remarked "burns off twice a year."²³ Everglades became a counterweight to the National Park Service's generalizations about fire, the place that

²⁰ National Park Service, Annual Fire Report, January 1-December 31, 1954; Acting Regional Director to Superintendents, Region Two Field Areas, April 10, 1956, Office of the Superintendent, Grand Teton National Park, Grand Teton National Park Archives.

²¹ Annual Forest Fire Report of the National Park Service, 1956, 1; Regional Director to Superintendents, Region Two Field Areas, March 22, 1957, Office of the Superintendent, Grand Teton National Park, Grand Teton National Park Archives.

²² United States Department of the Interior, National Park Service, "Fire Control Handbook," ca. 1958, NPS Technical Information Center, Denver, microfilm.

²³ Daniel Beard, "Wildlife Reconnaissance: Everglades National Park Project," (National Archives, RG 79, Everglades National Park, 0-35, Proposed Park file, A2621, 1.

disproved existing theories of fire management and offered a new look at how the NPS could approach fire.

Although authorized by Congress in 1934, Everglades was not formally designated a national park until December 6, 1947. During the intervening years, the National Park Service acquired land for the park, closely following the parameters that Congress authorized. This acquisition process paid little attention to questions of management, and only when the park finally was dedicated did the NPS begin to discern what it had obtained. Spread out over much of south Florida, the new park presented incredible opportunities and even greater challenges.

Within a very few years, the National Park Service recognized that Everglades, among the first parks established for biological purposes rather than monumental scenery, did not fit the model that the NPS developed for its western parks. According to its organic legislation, Everglades was established to create a “wilderness, (where) no development ... or plan for the entertainment of visitors shall be undertaken which will interfere with the preservation intact of the unique flora and fauna of the essential primitive natural conditions.” This powerful legislative mandate simultaneously differed from and challenged park management standards of the era.²⁴

Fire distinguished Everglades from the western national parks. In a different climate and environment, the Florida park experienced endemic fire, but observers believed that fire in the Everglades had a salubrious effect. “Within a few weeks after fire, the glades are green with sawgrass shoots, and the pinelands full of flowering herbs and new grasses,” observed William B. Robertson. Hired as a fire technician, he gravitated to research and conducted a study of fire at the park in 1953. “Even the scars of burned-out hammocks are soon hidden by rank growth of fireweed shrubs and vines,” he said.²⁵ Robertson’s tone reflected the disconcerting nature of what he saw. Fire in the Everglades had a different impact and even a different function than it did in the western parks. It was undeniable, ever present, more acceptable to the surrounding natural communities, and more complicated by the region’s peculiar hydrology and biology.

By the time the National Park Service arrived in South Florida, the patterns of fire in the Everglades had been long established. Despite newspaper accounts throughout the early twentieth century that sought to dispel the notion that the Everglades continually experienced natural fire, lightning had been a consistent causative factor. The region experienced frequent and widespread lightning fires that typically occurred during the May to October wet season and did little damage. Such fires played a crucial role in maintaining many plant complexes. From such fires, observers after 1947 inferred that fire in general had little impact on the park, an assumption that belied a far more complicated reality. Fires in drier periods of the year, November to April, often caused greater damage, inducing plant succession by destroying the root systems of even fire-resistant plants. Such fire even consumed dried-out organic soils. Typically, large

²⁴ Everglades National Park Authorization Act, 16 U.S.C. sec 410 (1988) (enacted 1934); on December 6, 1947, President Harry S Truman dedicated the park with the words: “Not often in these demanding days are we able to lay aside the problems of the time, and turn to a project whose great value lies in the enrichment of the human spirit. Today we make the achievement of another great conservation victory. We have permanently safeguarded an irreplaceable primitive area. We have assembled to dedicate to the use of all people for all time, the Everglades National Park.”

²⁵ William B. Robertson, *A Survey of the Effects of Fire in Everglades National Park* (Washington, D.C.: National Park Service, 1953), 1.

lightning fires were far from settlements; community interests aggressively squelched closer ones.²⁶

Human fire produced an even more pronounced impact. Native peoples had clearly used fire to modify their environment, as they did throughout the Americas and indeed the world. When Euro-American settlers came to the region, their efforts “beggared” their predecessors, Robertson noted. “The frequency of man-made fires probably increased sharply as whites replaced aborigines.” Settlers came from a culture of aggressive use of fire, and on the peripheries of their world, social order diminished and carelessness that led to fires often resulted. In an effort to improve agricultural prospects, Euro-American settlers began to drain the Everglades. The lowered water levels that resulted increased both the frequency and severity of human-induced fires. An arterial canal system begun in 1905 and the completion of a dike at Lake Okeechobee in 1935 exacerbated existing problems. As drainage became more effective, fires increased in severity. The newer desiccation, especially of the lower glades, extended the fire season by months, pressuring the nascent fire response mechanisms of the NPS. When fires occurred, their intensity led to greater destruction of hardwood forest vegetation as well as organic soils. Robertson’s characterization of an “imposing picture of fire occurrence” as a result of the Euro-American presence provided a strong rationale for aggressive NPS action.²⁷

Everglades clearly presented an entirely different range of fire problems. In the four years following its establishment, the park experienced extremes of fire. In 1948, only 1,965 acres burned; two years later, in the year of the three fires, 121,370 acres of vegetation went up in flames. Specific problems were already evident. The hammocks on the western half of Long Pine Key were severely damaged. The June 1951 Ironpot Hammock and Shark Valley fires gutted many tree islands and destroyed much of their organic soil, while also burning out remaining muck deposits of sawgrass areas. The situation appeared dire and called for new strategies. The NPS was confronted with a management question it had not considered.²⁸

By the early 1950s, the National Park Service had seen enough fire at Everglades to recognize that conditions there challenged its assumptions about fire control. Its first crisis came in 1950, when three large fires, called Tamiami No. 3, Long Pine Key Fire No. 3, and Mowry Fire, required simultaneous suppression. The park lacked the resources to fight three fires at the same time. The “fire emergency merely spotlighted this fact,” Dan Beard wrote in the aftermath of a critique held at park headquarters. Beard believed that the park showed strength in “the spirit of the men and women (permanent, seasonal, and temporary) who tackled the undertaking.” Despite their valiant efforts, he said, their attempts were inadequate. Although the park could take pride in suppressing three fires “each of which experienced fire fighters and ‘glade cats’ said nobody could put out,”

²⁶ David McCally, *The Everglades: An Environmental History* (Gainesville: University of Florida, 1999), 18-20.

²⁷ Robertson, “A Survey of the Effects of Fire in Everglades National Park,” 3-13; Pyne, *Fire in America*, 302-03; McCally, *The Everglades*, 31-57.

²⁸ Robertson, “A Survey of the Effects of Fire in Everglades National Park,” 167; Pyne, *Fire in America*, 302.

Beard insisted, "I am determined that the park staff will not be called upon to undergo any repeat performances."²⁹

These fires clearly showed that the park's technical capabilities were inadequate. The combination of information and mechanization that characterized the era had not yet reached Everglades, a relatively new park far from the main focus of the NPS. The park had not yet developed a fire management plan. Park maps were old and outdated, without roads, trails, and in some cases, terrain and plant distribution. Firefighters started with inaccurate information about the geographic features they encountered and the fuel types and loads they battled. The park's communication systems also fell short of optimal. Dependent on walkie-talkies as a result of the absence of telephone lines, the park simply did not have enough sets for its firefighters. The park did not own enough radio sets to assure constant communication and their range was insufficient. The park's dispatchers lacked training for fire management, park vehicles did not possess sirens, and the park's safety mechanisms were undeveloped. Contingency plans for hiring temporary fire fighters did not exist; no one had thought to develop a ready supply of potential workers before fire season. From an infrastructural perspective, the park fell far short in almost every respect, an endemic problem especially for eastern national parks during the early 1950s.³⁰

Robertson recognized the combination of employee strain and inadequate fire-fighting resources as a severe obstacle to managing fires. Five years of fire fighting had "absorbed much of the productive energy" of the Everglades staff, he noted, but the results "inspired no feeling more robust than a very reserved optimism." The problems seemed beyond the reach of park staff, a sentiment with which Beard concurred in the aftermath of the 1950 fires. Despite learning a great deal about the park and its fires and developing and implementing a comprehensive fire-fighting program, the NPS could do little about the real problem – the diminishing amount of water available in the Everglades. The U.S. Army Corps of Engineers planned an enormous flood control project for central and southern Florida. The NPS viewed this project with considerable trepidation. Less water than the already diminished supply was not even conceivable from the NPS view. Without more water, "the best efforts of fire detection and suppression," Beard insisted, "are likely to provide only local victories in a lost war."³¹ This tacit admission of the impossibility of implementing policy was a first in the National Park Service and led to the embrace of a different vision of fire in the Everglades.

A move to formalize the use of prescribed fire in Everglades National Park ensued. The park's specific conditions made suppression a dangerous strategy. Officials long had recognized that suppressing fire in rockland areas led to rapid domination of the landscape by hammock vegetation. Early NPS suppression efforts had succeeded, allowing broad-leafed hammock vegetation to spread, especially along rock pinnacles,

²⁹ Fire Critique, Everglades National Park, May 16, 1950, Records of Key Officials, Box 7, File 19, E-Fees, Everglades National Park, Everglades National Park Archives.

³⁰ *Ibid.*, 3-4.

³¹ Robertson, "A Survey of the Effects of Fire in Everglades National Park," 169; Fire Critique, Everglades National Park, May 16, 1950; Thomas J. Allen to District Engineer, Jacksonville District, U.S. Army Corps of Engineers, August 5, 1949; Devereux Butcher to Newton B. Drury, February 24, 1948; Newton B. Drury to Devereux Butcher, February 27, 1949, Records of Key Officials, Box 7, File 19, E-Fees, Everglades National Park, Everglades National Park Archives.

northerly facing sections, and in the wettest areas. In some places, the plants reached twenty feet in height. In all areas, they created a dense understory, the predicate of a “calamitous” fire, Daniel Beard wrote in 1956, “perhaps killing pine as well as understory.”³²

Beard quickly turned into an advocate of the use of fire. In 1956, he argued that its absence promoted the expansion of hardwoods, which in turn would lead to the extinction of the southern Florida slash pine and other pineland plants. Committed to protecting Long Pine Key and other park areas as pineland, Beard regarded fire suppression as the chief obstacle to his natural resource management goals. Beard’s memorandum catalyzed support for controlled burning at the Everglades. Regional Director Elbert Cox sought NPS Director Conrad L. Wirth’s approval for this controversial plan. Wirth authorized a specific management plan for the project, with the caveat that he see the plan and approve it before it was introduced and that the conservation community be given a look as well. In June 1957, a completed plan reached the Washington office of the NPS. After much deliberation and a thorough review of the differences between Everglades and the rest of the park system, in October 1957 Conrad Wirth approved the first controlled burning plan within the national park system in more than thirty years.³³

The plan was elaborate and persuasive, showing the impact of almost a decade of research in South Florida. The initial proposal called for one round of burning, with careful evaluation before any additional burns took place. It outlined eleven burning blocks, lettered A through K, with initial plans to fire nine of the eleven. D and K, which later was redefined as blocks K through Y, were to be left for the future. NPS managers planned to burn backfires into the wind, only lighting headfires sufficient to immolate advanced hardwood succession. The park built twenty miles of roads on Long Pine Key to accommodate the fire plan. By spring 1958, Everglades stood ready to implement its plan.³⁴

When park rangers lit fires in Block B on Long Pine Key on April 21, 1958, they inaugurated the first long-term prescribed fire plan in the national park system. Between 1958 and 1973, forty-nine prescribed fires were set in Blocks A through Y. Fifty-two more were begun between 1973 and 1979, comprising the vast majority of NPS prescribed burning in that era. Burning during the summer was less frequent; only thirteen of the 101 fires in this era were started between June and September. The period between October and January became the favored season. In 1976, time-of-year restrictions were finally removed.³⁵

Everglades presented a fire scheme unfamiliar to the National Park Service. The first generation of fire managers had all learned their skills in the West, influenced by the Forest Service and the legacy of the 1910 fires. Everglades was different. The NPS had

³² Daniel Beard, Memorandum to Regional Director, July 11, 1956, Everglades National Park, 883.01; William B. Robertson, “Fire and Vegetation in the Everglades,” in E.V. Komarek, ed., *Tall Timbers Fire Ecology Proceedings* (Tallahassee, FL: Tall Timbers Research Station, 1962) No.1, 67-80.

³³ Dale L. Taylor, “Fire History and Fire Records for Everglades National Park, 1948-1979,” Report T-619 (Homestead, FL: South Florida Research Center, 1981), 14-16.

³⁴ Superintendent to Regional Director, June 21, 1957; Memorandum from the Director, October 9, 1957; Superintendent to Regional Director, January 6, 1958, Everglades National Park, 883.01.

³⁵ Taylor, “Fire History and Fire Records for Everglades National Park, 1948-1979,” Report T-619, 16-17.

no experience with local residents who said: “This country has always burned and always will, and anyway fires don’t hurt anything here,” as Robertson was told repeatedly. Yet, officials could identify a pattern that threatened the NPS’s long-term ability to protect park values. As the Everglades became drier, sustaining the ecological and scenic status quo became progressively more resource intensive and expensive. The park lacked the time, resources, and manpower to reverse the effects of the human-induced drying of the area. The fires that resulted did real damage, destroying the very attributes that made the Everglades ecologically important.

The situation presented a dilemma. The National Park Service remained devoted to the principles of suppression, but local conditions did not support the implementation of such a strategy. Residents did not react to fire with the outrage common in the West. It seemed to them inevitable and not much of a problem. Nowhere had the National Park Service encountered a situation where it regarded fire as a more severe threat than did its neighbors. The specter of prescribed burning had been buried by Albright and Coffman in the 1930s, and even the Forest Service’s wartime recognition of the value of the practice did not sway the NPS toward a broader conceptualization of the role of fire.³⁶ Inside the Service, no one advocated a shift in policy.

Still, Everglades was not the first or the only park to experiment with prescribed burns. As early as 1950, Superintendent Eivind T. Scoyen of Sequoia National Park, a venerated NPS leader and a man of considerable vision, supported the designation of the Kaweah Basin in the upper Kern River drainage as a research area that would not be subjected to fire suppression. Even as he advocated the conceptual change in fire management, Scoyen asked to retain authority to intervene if fire there threatened other areas of Sequoia.³⁷ The National Park Service accepted the principle that fire should not be instantly suppressed in some parts of the park system even before the controlled burn program at Everglades began.

The decision at Kaweah Basin hardly represented a nationwide policy change. Regional Director Owen A. Tomlinson took great pains to establish that the Kaweah Basin presented a unique situation, telling NPS Director Newton B. Drury that the area was “so completely isolated, with unique values that depend completely on its being left alone, that such a special designation would establish no precedent.” Kaweah Basin was more than 11,000 feet in elevation. Its lightning fires could not be easily seen from lookout posts, but with the advent of aerial fire reconnaissance, fires were spotted inside the basin more easily. When Lowell Sumner, a veteran NPS biologist who assessed parks throughout the West, urged that Sequoia managers allow the basin to remain in “a natural state, free from any human interference,” he argued for a piece of wild nature that had little implication for other forms of park management.³⁸ By succeeding with an argument about the unique attributes of the basin, Sumner, Scoyen, and Tillotson achieved a small

³⁶ Bruce M. Kilgore, “Fire Management in the National Parks: An Overview,” *Tall Timbers Fire Ecology Conference Proceedings*, No. 14, 45-58.

³⁷ E. Lowell Sumner, “The Kaweah Basin Research Reserve: An Untouched Area for the Future;” Regional Director to Director, February 6, 1950, Sequoia National Park, FR 1950, 1970-1976, Ma-U, Box 327, F317, Sequoia National Park Archives.

³⁸ Sumner, “The Kaweah Basin Research Reserve: An Untouched Area for the Future,” 6; Regional Director, Memorandum of August 24, 1949, Sequoia National Park, FR 1950, 1970-1976, Ma-U, Box 327, F317, Sequoia National Park Archives.

objective: they protected the prerogative of a research area. They did not intend nor did they make a claim for a larger use of fire in national parks.

Other instances of variance with policy with official sanction followed during the 1950s. At Pipestone National Monument, Superintendent Lyle K. Linch experimented with controlled burning of grasslands inside the park. Recognizing that the scene around the famed Hiawatha quarry no longer resembled historic descriptions of the area because the absence of fire created a more heavily wooded vista than had existed before, Linch sought support for burns that would recreate historic conditions. Photographic evidence from the 1920s bolstered his case; even the grasslands of that era had become heavily wooded in the ensuing thirty years. At the regional office in Omaha, Linch found archaeologists and other cultural resource professionals supportive. In 1950, as the summer travel season began, with the help of the Pipestone community, Linch burned grasslands inside the park. The community found nothing unusual in this practice. Farmers and ranchers in the region had long burned their lands at the end of the summer as well.³⁹

The Pipestone experiment was unusual, but it characterized a strategy that circumvented the restrictive NPS suppression policy. Into the 1950s, many park superintendents retained considerable autonomy, with some still able to operate more or less as free agents. Countless idiosyncratic practices were common, especially at remote or less significant parks that had strong ties to local cultures. The emergence of prescribed burnings at Pipestone and other isolated parks reflected the lack of centralized authority, an historic point of pride for the National Park Service. It also suggested that compelling the proliferating number of parks to hew to the overall NPS line on fire was more difficult than the NPS Division of Forestry anticipated. Linch was an exception. He told his superiors about the upcoming burns, couching them in terms of a debate about the authenticity of the cultural resources setting at the park. Posed this way, the use of fire was not a challenge to the status quo. It stemmed from the kind of zealous professional rectitude that marked Linch's career. Viewed as an eccentric by his superiors, Linch created leeway for the use of fire, although it hardly qualified as precedent. Although the regional office eventually curtailed the practice, Linch was neither sanctioned nor removed from his office because of this violation of policy. Tolerance might not describe the NPS view of such activity, but times had changed since the days when Albright, Coffman, and others weighed heavily on any advocates of fire's practical use.

By this time, scientific thinking about fire had begun to change. University-trained scientists had already revolutionized their approach. At the University of California, Berkeley, Harold Biswell arrived in 1947 to teach range management. Although he had been advised to avoid precisely this controversy, Biswell promptly committed what was at the time a heretical act: he advocated controlled burning in California. Biswell had learned the practice during a stint in the South and had the good fortune to make his suggestion just as a reversal in California state policy allowed the use of controlled fires to improve rangelands. He jumped into the debate at a fortuitous moment – the first time that the use of fire as a tool to shape landscape had been seriously

³⁹ Superintendent, Pipestone National Monument to Regional Director, March 21, 1950, Pipestone 701, National Archives and Records Administration, Central Plains Region, Kansas City, MO; Hal K. Rothman, *Managing the Sacred and the Secular: An Administrative History of Pipestone National Monument* (Omaha: National Park Service, 1992), 177-79.

discussed in almost 50 years. Biswell “was a wonderful guy, and completely unabashed in his enthusiasm for fire, and its role,” Robert Barbee, who first encountered the professor during the 1960s, remembered. “We worked well together because he was a showman. He got it done; he would have done well on Madison Avenue. We had little press conferences, and we would go out and have little seminars for people where we had the media there, and that sort of thing.”⁴⁰ Although the array of forces in California allied against the practice remained powerful and prominent, Biswell’s program reflected a vision for a different future of fire management.

The idea of “light burning,” as controlled burning had been known, had never really died, but it had been eliminated from the world view of federal agencies. Western in their orientation toward fire, federal land managers largely accepted the paradigms of the forestry profession as implemented by the Forest Service, which determined to eliminate the practice. The Forest Service’s control of fire management through the Forest Protection Board and other mechanisms exiled anyone who thought of using fire as a tool to manage land to the far peripheries of fire management. Those who thought about using fire were denied access to USFS resources, the largest available source of funding for fire. Advocating controlled burning and accessing federal fire protection and response resources became an impossible combination. With no other real sources of support for fire available, most land managers accepted suppression and did not publicly challenge its tenets.

Biswell became the pivotal figure in bringing ideas about prescribed fire to federal agencies. A native of the Midwest, he learned his craft in both the West and the South. After completing a Ph.D. in botany and forest ecology at the University of Nebraska, he was hired in 1930 to work at the USFS forest experiment station on the University of California campus at Berkeley. In the decade Biswell spent there, he studied mountain meadows and woodland-grass ranges. In 1940, he transferred to the Forest Service Southeastern Experiment Station in North Carolina, bringing the western forester’s vision of fire as the enemy. There he witnessed the Forest Service’s experiments with burning in the southern pineries in 1943, a revolutionary decision for that agency. The seven years Biswell spent in North Carolina changed his understanding of the role of fire in natural communities.⁴¹

When he returned to Berkeley in 1947, Biswell carried with him to the hostile intellectual climate of the American West a generation of knowledge gleaned elsewhere. The South had changed him and his views, although not for the better in the view of his Forest Service mentors. Even after he was gently cautioned by his USFS mentor, Edward I. Kotok, in 1947 chief of research for the Forest Service, to stick to range management when he reached California, Biswell soon returned to studying the impact of fire on range management. He found that fire improved range land in the woodlands of the Sierra foothills and developed a method of burning upslope without firelines in chaparral. And

⁴⁰ Jan W. van Wagtenonk, “Dr. Biswell’s Influence on the Development of Prescribed Burning in California,” *The Biswell Symposium: Fire Issues and Solutions in Urban Interface and Wildland Ecosystems* (USDA Forest Service, General Technical Rep., PSW-GTR-159, 1995), 11-14; Robert Barbee, interview by Hal Rothman, Part I, November 12, 2004; Pyne, *Fire in America*, 119; David Carle, *Burning Questions: America’s Fight with Nature’s Fire* (Westport, CT: Praeger, 2002), 58-60.

⁴¹ van Wagtenonk, “Dr. Biswell’s Influence on the Development of Prescribed Burning in California,” 12; Carle, *Burning Questions*, 57-58.

he began to burn ponderosa pine – the most prevalent tree in California, covering almost 4 million acres – in 1951.⁴²

Biswell's return to California precipitated a revolution in the way federal agencies approached fire. Federal fire response had been shaped in the voluminous fires of the Northern Rockies and the Sierras. In a distant mirror of the westward motion of southerners after the Civil War, the ideology of southern fire management moved west through the person of Harold Biswell. Southern practices offered a counter, even a rebuke, to existing thinking; at Biswell's urging, the scientific community increasingly seemed willing to consider such ideas. Only the diehards, the federal agencies that depended on the Forest Service for leadership and funding, retained full-fledged commitment to suppression.

A considerable body of scientific literature argued that fire could be a useful instrument of resource management. Forester H. H. Chapman led the way; after him others developed situation-specific research that advanced the idea of controlled burning. One influential piece, forester Harold Weaver's 1943 *Journal of Forestry* article titled "Fire as an Ecological Factor in the Ponderosa Pine Region of the Pacific Slope," attracted Biswell's attention. Weaver's later writings were also worthy of note. Working for the Bureau of Indian Affairs, Weaver implemented a controlled burning program on the Fort Apache Reservation in 1950, burning more than 50,000 acres of ponderosa pine. In the subsequent two years, wildfires were reduced by more than 90 percent on the burned acreage, a rate less than one-ninth that on land that had not been burned.⁴³ Clearly, in certain circumstances, planned fire could be used to obviate wildfire.

Despite the experience of the Everglades and the growing consensus among scientists that there was a role for fire in ecological settings, the National Park Service was slow to assess the possibilities of the new strategy. Visitation, not fire, was at the forefront of Service concern in the early 1950s, and the efforts at Everglades were anomalies. During the post-war era, visitation grew from a low of 6,838,000 in 1943 to 31,735,000 in 1949 and 46,225,000 in 1953. Both 1941, before the war, and 1946, after it ended, had been in the 21 million-visitor range. By 1949, that number had increased by more than fifty percent. No dimension of the NPS – not visitor services, not the ranger division, and certainly not fire protection – could keep pace. Inundated and overwhelmed best described the national parks; addressing the onslaught took all the limited resources at NPS disposal. Director Conrad L. Wirth encapsulated the problem for *Reader's Digest*. The Service could not "provide essential services. Visitor concentration points can't be kept in sanitary condition. Comfort stations can't be kept clean and serviced. Water, sewer, and electrical systems are taxed to the utmost. Protective services to safeguard the public and preserve park values are far short of requirements. Physical facilities are deteriorating or are inadequate to meet public needs. Some of the camps are approaching rural slums. We actually get scared when we think of the bad health conditions."⁴⁴

⁴² van Wagendonk, "Dr. Biswell's Influence on the Development of Prescribed Burning in California," 12; Carle, *Burning Questions*, 57-58.

⁴³ Carle, *Burning Questions*, 62-63.

⁴⁴ National Park Service, "Public Use of National Parks: A Statistical Report, 1941-1953"; National Park Service, "Public Use of National Parks: A Statistical Report, 1954-1964"; Charles Stevenson, "The Shocking Truth About Our National Parks," *Reader's Digest* January 1955; Conrad L. Wirth, *Parks, Politics, and the People* (Norman: University of Oklahoma Press, 1980), 237-38.

This problem was not confined to national parks, it permeated public land management throughout the 1950s. Campers left campfires to burn out without supervision and drivers tossed the ubiquitous cigarette butt out the car window and onto dry terrain, where it smoldered in brush until all too often it started a forest fire. Despite an extensive fire awareness campaign, education ran up against the fundamental recalcitrance of the public. As long as suppression remained the model, the solution to the woes of heavier use and increased carelessness could only be the application of an ever-greater quantity of resources to the problem of fire.⁴⁵

One answer for the National Park Service came from an unexpected source. In 1956, MISSION 66, a ten-year program to upgrade facilities and staffing in advance of the fiftieth anniversary of the 1916 founding of the National Park Service, provided the park system with its second comprehensive development program. In the decade-long program, Congress poured more than \$1 billion into the parks, which translated into an enormous impact on every dimension of the National Park System. MISSION 66 financed countless visitor centers and other structures, improved employee housing opportunities at most parks, paid for road construction, built campgrounds and other visitor facilities, and helped end the public cries to close the national parks if they could not be properly maintained. MISSION 66 had as transformative an impact on the park system as did the New Deal.⁴⁶

Although MISSION 66 was not specifically designed to achieve fire suppression goals, many of its activities supported a new emphasis on this objective. Suppression had succeeded when resources were available to support it. World War II had pushed the NPS away from efforts to suppress fire everywhere in the parks, restricting its activities to easily accessible places. The post-war era compelled a fundamentally reactive posture. With important exceptions – such as the Everglades, Kaweah Basin in Sequoia National Park, and Pipestone National Monument – most parks simply responded to fires and sought to put them out as quickly as possible. Major fires were the most threatening crisis any park faced and the most difficult to anticipate.

Among MISSION 66's primary activities, building roads and trails offered advantages for fire control as a result of the improved access they created. Roads and trails made it easier to get the firefighters' vehicles and heavy equipment on which fire control increasingly depended to the places where fires raged. Parks such as Olympic National Park routinely used the elaborate trail systems inherited from the Forest Service as the basis of their fire response strategy. MISSION 66 funds lessened the strain of upkeep, making these pathways even better tools of access for fire suppression, while they still supported other purposes.⁴⁷

In fire management, MISSION 66 first exacerbated the problems of the post-war era, and then began to provide a remedy for them. In fire protection, as in so many other areas, MISSION 66 functioned as a more comprehensive version of the New Deal. It provided an injection of federal resources that allowed the National Park Service to

⁴⁵Baker, Maxwell, Treat, and Dethloff, *Timeless Heritage*, 131-33; Hal K. Rothman, *Saving the Planet: The American Response to the Environment in the Twentieth Century* (Chicago: Ivan R. Dee, 2000), 129-30.

⁴⁶Roy E. Appleman, "A History of the National Park Service Mission 66 Program," January 1958, 1-22, NPS Technical Information Center, Denver, microfilm.

⁴⁷Guy Fringer, *Olympic National Park: An Administrative History* (Port Angeles, WA: National Park Service, 1991), 102-3, 105-6, 131-32.

respond to the changes in visitation patterns and to increased use of national park lands. The inclusion of fire protection in what was essentially a capital development program took a number of years. MISSION 66 began in 1956, and its impact on the system was almost immediate. By 1960, Acting NPS Director Eivind T. Scoyen, who had considerable experience with fire as a result of his superintendencies at Glacier, Sequoia, and other parks, recognized the implications of MISSION 66 on the fire management program. “The MISSION 66 Program to date [has] altered the patterns of use by park visitors,” he informed the regional directors “Operating programs have changed and many other factors indicate the need to restudy the forest protection program for each park.”⁴⁸

Scoyen recognized that MISSION 66 efforts made the parks’ fire situation worse. Capital development allowed more people to visit places that previously had been out of reach, increasing the danger of human-induced fire in many new places even as lightning fires were simultaneously on the rise due to the increased fuel load that resulted from successful suppression. An old pattern had repeated. As the National Park Service pulled back from its New Deal-era commitment to fight fire everywhere, people brought fire to new places because of development. The Service had to galvanize MISSION 66 for fire protection as well as development.

The fault, Scoyen believed, was that existing funding schedules for fire did not accurately reflect the situation in the national parks. Requests for Forest and Fire Control reserve money far exceeded the available funding, a circumstance Scoyen believed stemmed from poor planning, but in fact was a historic problem in the NPS. Resources to fight fires had never been sufficient – except as a result of extraordinary programs such as the New Deal. Scoyen sought an overall review of fire control as the NPS practiced it, looking for both an assessment of infrastructure and of practice. He asked the regional directors to assess the methods of detection, the operational phase of fire control, and to document estimated increases in revenues.⁴⁹

Suppression had become increasingly untenable, a fiction that the National Park Service told itself. The vast resources that poured in through MISSION 66 masked the increasing difficulty of the 1950s with a characteristic salve – the application of enormous amounts of dollars to the system’s problems. It provided a second instance in a thirty-year period during which the NPS had enough resources to meet every whim a superintendent or a regional director might ponder. Cleared trails had the same influence on fire-fighting in the 1960s as they had in the 1930s. So did thinning of underbrush, clearing of danger spots, and an array of other practices that the Service engaged in as a reflex. MISSION 66 promoted the possibility that suppression could remain viable – if only enough resources were devoted to it on a regular basis.

At the same time, a new heady era began for the National Park Service in 1956. MISSION 66 had finally given the Service the facilities to accommodate the tremendous growth in travel that followed World War II. Because of a divergent series of forces in post-war American society, the National Park Service began to move in new management directions. Two significant changes – the G.I. Bill that trained so many scientific

⁴⁸ Memorandum: Forest Protection Planning, Acting Director to Regional Directors, Regions One, Two, Three, Four, and Five, July 21, 1960, Yellowstone Archives, Yellowstone Box Y-239.

⁴⁹ Memorandum: Forest Protection Planning, Acting Director to Regional Directors, Regions One, Two, Three, Four, and Five, July 21, 1960, Yellowstone Archives, Yellowstone Box Y-239.

specialists at the college level, and two reports, the A. Starker Leopold Committee's *Report on Wildlife Management in the National Parks* and the National Academy of Sciences' *A Report by the Advisory Committee to the National Park Service on Research*, known as the Robbins Report after its lead author – compelled a new vision of National Park Service management.⁵⁰ In a way never before tenable, the Service embraced science as a guiding administrative force, its people focusing with renewed vigor on resource management as a core mission. Fire management became a significant component of that obligation.

Fire science continued to move forward, largely apart from the National Park Service. Tall Timbers, a Florida research station created in 1958 to study long-term fire ecology, became the conduit for some of the most exciting research on the use of fire. Developed by a wealthy landowner and a well-known wildlife biologist who operated a wildlife experiment station, Tall Timbers set a high standard. Beginning with the publication of its first conference proceedings in 1962, Tall Timbers became the center of innovation in fire ecology and directly contradicted the Forest Service model. Under Edward V. Komarek, the visionary scientist who pioneered the use of fire during the twenty-five years he worked in the region prior to the founding of Tall Timbers, the research station became the most innovative place in the world of fire study. The most original and even heretical ideas about fire usually could get a hearing at the annual Tall Timbers conferences, and the open inviting climate created healthy discussion about the role of fire in the natural world.⁵¹

This type of intellectual innovation was new to the NPS. The Service had been a tight-knit cadre since its inception, with tremendous loyalty to the values of leadership across generations of employees. There were “greenblood” families, second- and by the 1960s, third-generation members of families serving in the NPS. The presence of Horace M. Albright, more than thirty years past his directorship but still a vital and influential force, added to the reverence for historical practices. Despite the efforts of the first head of the NPS Wildlife Division George M. Wright, whose life had been cut short by an automobile accident outside of Deming, New Mexico, in 1936, science had rarely been a particularly strong dimension of the NPS culture.⁵²

In this context, the Leopold and Robbins reports set a higher standard for science in the national park system and greatly influenced the Service's natural resource management policies. Written by a group of noted wildlife scientists, the Leopold report transformed a report on the condition of wildlife in the national parks into a powerful argument for a new approach to management of national park areas. The report

⁵⁰ Richard West Sellars, *Preserving Nature in the National Parks: A History* (New Haven: Yale University Press, 1999), 212-22; A. Starker Leopold, et al., “Wildlife Management in the National Parks,” in James B. Trerethren, *Transactions of the Twenty-Eighth North American Wildlife and Natural Resources Conference* (Washington, D.C.: Wildlife Management Institute, 1963); National Academy of Sciences, National Research Council, “A Report by the Advisory Committee to the National Park Service on Research,” typescript, Aug. 1, 1963; for more on the larger changes of the era, see Patterson, *Grand Expectations*, 174-75, 277-78, 313-20 and David Halberstam, *The Fifties* (New York: Villard, 1993), 286-94, 495-96, 623-25.

⁵¹ Carle, *Burning Questions*, 43, 94, 117-19; Pyne, *Fire in America*, 293, 302.

⁵² Donald Swain, *Wilderness Defender: Horace M. Albright and Conservation* (Chicago: University of Chicago Press, 1970), 311-16; Richard Sellars, “The Significance of George Wright,” *George Wright Forum* 17:4 (2000), 46-50.

recommended maintaining or recreating the original ecology of a park as a “reasonable illusion of primitive America,” a goal much at odds with the manipulated nature of many parks. Believing that natural conditions should prevail, the authors suggested removing all non-native species from parks, putting biologists rather than interpreters in charge of managing wildlife, and emphasizing the role of fire in forest regeneration, among other management practices. The Robbins report focused on the National Park Service’s research needs. Everglades was among the parks the committee visited, and it paid close attention to that park’s experiments with fire. The report concluded that the NPS should preserve national parks primarily for the aesthetic, spiritual, scientific, and educational values they offered the public. The Service’s research agenda, in the committee’s view, should directly support those goals. Fire was included in the mix of components the report thought valuable to the park system.⁵³

The Leopold Report specifically addressed the role of fire in national parks and argued for a change in direction. With its primary focus on wildlife and habitat, the report saw fire as a tool for shaping the park environment. Pointing to the experience of the East African grasslands, where humans used fire to shape their environment for centuries, the report argued for fire as a strategy for habitat management. Controlled fire was “the most ‘natural’ and much the easiest and cheapest to apply,” the report averred. It acknowledged that fire suppression created conditions that had to be modified before any systematic plan of controlled burning could take place. Conversely, suppression had created a need for aggressive management before controlled fire could be introduced.⁵⁴

The two influential reports challenged existing National Park Service practices, powerfully arguing for a stronger ecological basis for park management. Influential, they combined with an internal Service transformation to create an ecological strain in NPS thinking. Among the thousands of veterans who went to college, some saw careers in government as a viable extension of their military service. A small number became biologists, wildlife specialists, and other natural resource-oriented researchers. Some of these joined the NPS, many hired with funds provided by MISSION 66. Trained as scientists in the era that saw the Soviets put a spacecraft in outer space, they seemed representative of the new. Before their arrival, most NPS staff members had been generalists, but these new employees brought a specialized perspective to park management. By the early 1960s, they comprised a constituency that favored precisely the sort of recommendations that the Leopold and Robbins reports offered, albeit one that had yet to dramatically influence NPS policy.⁵⁵

The twin reports began to create a position for scientific management in the NPS, giving science, in particular the discipline of ecology, much greater visibility in making policy. By the mid-1960s, the National Park Service committed itself to professional management of natural resources and for the first time since the era of George Wright, appeared to listen to its scientists. Wildlife biologists and other scientists in the NPS looked for a way to push a science-based management agenda forward. The scientists brought a different vision. Where the first two generations of the National Park Service

⁵³ A.S. Leopold, S.A. Cain, C.M. Cottam, I.N. Gabrielson, and T.L. Kimball, *Wildlife Management in the National Parks: The Leopold Report* (Unpublished, 1963), 10; Ethan Carr, *Wilderness By Design: Landscape Architecture and the National Parks* (Lincoln: University of Nebraska Press, 1998).

⁵⁴ Leopold, *Wildlife Management in the National Parks*, 14.

⁵⁵ Sellars, *Preserving Nature in the National Parks*, 214-32, 242-45.

hated fire and treated it as an enemy, these newly trained arrivals regarded it in a much more dispassionate manner. Fire was a tool they could use, they believed, and the growing body of research, much of it stemming from Tall Timbers and from Harold Biswell and his students, supported their vision. Their very presence in the Service helped spur the move toward a different kind of strategy to manage fire.⁵⁶

Leopold and Biswell's relationship greatly contributed to both the ideas in the Leopold Report and the implementation of its goals. Both men taught at the University of California, Berkeley, with their offices just across the street from one another. An innovative pair, they collaborated on research, profoundly influencing one another's thinking about fire. The two lunched together and jointly taught seminars for graduate students. A group of students and faculty interested in the same topics grew around them, for at a time when the University of California was acclaimed as the best public university in the nation, the opportunity to study with a pair of such natural resource luminaries could not be matched anywhere in the country. Their labs became crucibles for a new generation of fire scientists. A number of their graduate students pursued the ramifications of fire as dissertation topics. Four – Bruce Kilgore, who matriculated in 1968, Jan van Wagtendonk (1972), James Agee (1973), and David Graber (1981) – became National Park Service scientists who influenced fire policy during the subsequent generation.⁵⁷ In the long run, Biswell's impact, in concert with that of the Leopold Report, extended well beyond high-level discussions; it created a generation of scholar/practitioners who carried his ideas forward.

The idea of using fire as a tool spread in the aftermath of the Leopold Report, the most influential and controversial scientific report the NPS had yet commissioned. Tied to the historic models of the Forest Service and dependent on funding that stemmed from that agency, senior NPS officials remained wary of the shift away from suppression. Obstacles certainly remained, but at the grassroots, managers began to look at the environment around them and the consequences of fire and see real advantages in controlled burning. With more than twenty years in fire parks, Superintendent Scoyen served as a counter to older views of fire in the Service's highest echelons. He helped soften resistance to the new ideas. When the appreciation of the use of fire migrated from anomalous parks such as Pipestone to the parks the public knew best, Scoyen helped counter the skepticism at the top.

Implementation exploded on the NPS landscape. In 1965, Yellowstone National Park began to experiment with controlled burning. As it had been elsewhere in the system, the introduction of induced fires was couched in terms of another management goal: the development of resource management. As part of the park's Elk and Habitat Management Plan, Yellowstone undertook an aspen restoration program that relied on the controlled use of fire to achieve its goals. The program had two objectives: to ascertain if the burning of a former stand of aspen, taken over by conifers, would cause the area to revert to aspen, and to see if burning would enhance the "number and vigor of Aspen sprouts in a decadent stand," as Park Biologist Robert E. Howe described it. The park planned a large burn, but the summer remained too wet to sustain sufficient fire. Scaling

⁵⁶ Sellars, *Preserving Nature In the National Parks*, 214-16; Foresta, *America's National Parks*, 133-36, 148-62; Carr, *Wilderness by Design*, 1-14.

⁵⁷ Jan van Wagtendonk, "The Evolution of National Park Service Fire Policy," 329-330; James Agee, interview by Hal Rothman, June 10, 2004.

down his expectations, Howe carefully selected a location, a five-acre patch on a north-facing slope just south of the old Tower Fall road. Conifers had taken over a stand of mature aspen. Surrounded by grasslands, it provided an excellent opportunity for an experiment in controlled burning.⁵⁸

Finding optimal conditions proved difficult. By the end of September, the chance to burn seemed to have passed. In early October, Howe tried to set up the burn, only to be thwarted by a six-inch snowfall. Undaunted, the biologist kept trying. At 1:45 p.m. on October 28, in gusting winds of up to eighteen miles per hour and with a relative humidity of 50 percent, a crew under the supervision of District Ranger Bohlin began to intentionally burn timber inside Yellowstone National Park. The men sprayed the conifers with diesel oil and ignited them. The fire went up into the crowns and burned about ten trees closely clumped together. As the gusty winds died down, the fire followed, and despite efforts to reignite it, the crew recorded little success. After three hours and 200 gallons of diesel fuel, they decided that the conditions “weren’t going to be favorable this year for a burn,” Howe told his superiors.⁵⁹

Despite the failure to truly burn anything of significance, the very act of attempting to burn in Yellowstone represented a major step toward the idea of controlled burning. Yellowstone remained the signal park in the national park system, the barometer of the status and meaning of national parks. The idea that the National Park Service would throw over the historic practices of fire suppression – even under the guise of an elk management plan – was revolutionary. The importance of even indirect implementation at the nation’s most important park without a sound from the powerful advocates of suppression throughout the Service spoke volumes about the imminence of a formal change in policy.

Even more stunning, the regional office encouraged the continuation of the experiment. In December, Acting Regional Director George Baggley visited the plot with Howe and Superintendent John S. McLaughlin, and pronounced that he was pleased with the experiment. “The lack of complete success should not deter you from going ahead with the program,” he told McLaughlin. Baggley knew the literature on controlled fire and suggested that the very lack of fuel load that attracted Howe to the location might have made the experiment go awry. “You have a situation at Yellowstone which does not fit the book, so far as controlled burning is concerned,” he continued. “Keep it up though because I certainly think the results will be worthwhile.”⁶⁰

If not quite an attack on existing policy, the Yellowstone experiment reflected the importance of the newest studies of fire emanating from Biswell’s program at the University of California. Much of that work focused on California, where sequoias had always posed an intellectual problem for fire suppression. The big trees seemed impervious to burning, and ancient as they were, they forced a different calculus. Suppression was new, but the trees were very old. Asserting that the absence of fire had a positive impact on the big trees was an exercise in futility. Biswell began research in 1965 on stand modification and fuel reduction among the giant sequoia. In 1967, another

⁵⁸ Park Management Biologist to Chief Park Ranger, Memorandum: Prescribed Burn Experiment, November 18, 1965, Yellowstone National Park, N16,

⁵⁹ *Ibid.*, 2.

⁶⁰ Acting Regional Director to Superintendent, Yellowstone, December 20, 1965, N-1427 MWR, Yellowstone National Park Archives.

fire researcher, Richard J. Hartsveldt of the University of California published “The Fire Ecology of Sequoia Regeneration” in the 1967 *Tall Timbers Forest Ecology Conference Proceedings*. Immediately preceding his article was Biswell’s “Forest Fire in Perspective,” an assessment of fuel loads and fire hazards in the Sequoia region. Together, the two papers clearly articulated a strategy of prescribed burning among the sequoias.⁶¹

This new intellectual regard for fire led to serious strategic rifts in the NPS. No matter how hard they tried, many of the more senior professionals in the Service could not swallow their distaste for the idea of intentionally burning vegetation. Their careers had been built around stopping fire in any way possible. Most had lost friends to fire; all had witnessed destruction of the parks – blackened forests and burned ranches, homesteads, and lodges. Many could intellectually understand the way in which prescribed fire could prevent greater calamity, but in their hearts, they believed – and everything they had ever seen taught them – that fire was too dangerous to be intentionally let loose. Just because the Leopold Report said the NPS should burn did not mean that generations of park professionals were simply going to go along.⁶²

For a number of years, the National Park Service’s fire control structure did its best to ignore the ideas developed in the Leopold and Robbins reports. Although assessing fire increasingly involved scientific analysis, fire prevention still dominated the NPS perspective. By the middle of the 1960s, the Service attempted to quantify the environmental conditions that influenced annual fire levels. Comparative levels of moisture began to be a feature of the annual fire report at individual parks, with the comparison of types, numbers, and distribution of fires increasingly linked to the patterns of rain and snowfall. Yet, throughout the middle 1960s, fire management goals remained the same and suppression remained atop the list of NPS objectives when it came to fire. When Glacier National Park offered a new fire control plan in 1965, it reiterated the long-standing vision of suppression so crucial to the Service’s formulation of its obligations: “Every fire when discovered shall be reached and extinguished as quickly as possible,” the report insisted, “whether caused by man or lightning, and whether originating in a developed section or in a wilderness area.”⁶³

The NPS finally had to face the implications of the Leopold Report. Resistance in the ranks was stiff. In response to the new mandate, Director Conrad Wirth averred that less intense suppression merited consideration, but he did not contemplate an immediate change in policy. Lawrence Cook, Coffman’s successor and a longtime devotee of suppression, manipulated information to support his beliefs. For months, Hartsveldt’s study of fire ecology in Sequoia and Kings Canyon National Parks, a document that threatened the viability of suppression as a strategy, lay in a pile of papers on Cook’s desk. Without support from the highest echelons of the NPS, a change in suppression policy seemed unlikely. Lacking a catalyst to compel a change in their views, the Service

⁶¹ Harold H. Biswell, “Forest Fire in Perspective,” 43-64; R. J. Hartsveldt and H. T. Harvey, “The Fire Ecology of Sequoia Regeneration,” 65-78, in Edward V. Komarek, Sr., ed. *Tall Timbers Fire Ecology Conference Proceedings*, No 7. (Tall Timbers, FL: Tall Timbers Research Station, 1967); Pyne, *Fire in America*, 302.

⁶² Sellars, *Preserving Nature in the National Parks*, 255; Art White, interview by Richard McCaslin, November 15, 1990, copy possession of the author.

⁶³ “Glacier National Park, Forest Fire Control Plan, March 1965,” Glacier National Park, Fire Cache Records, 1910-1990, Box 2; NPS Fire Control Handbook, 1965.

leadership seemed content to maintain the status quo no matter what the Leopold Report advocated.⁶⁴

The National Park Service faced two large-scale problems with suppression. The fragmentary constitution of the national park system raised the issue of scale repeatedly. Even at its largest parks, the NPS could not maintain a fire program sufficient to meet the demands of an exceptional year. Parks were constantly overstaffed if fire did not come, but dangerously understaffed if major fires occurred. Even more, fire defied any and all strategy; it was not a bureaucratic category that submitted to administrative solutions. Fighting fire was not at all like repaving roads or maintaining clean restrooms. It worked by its own impenetrable logic.

As had become common for the National Park Service by the 1960s, the impetus for change came from outside the Service – from its friends and supporters, energized by the environmental revolution and increasingly wary of even this most benign of federal agencies. The research supporting light burning was overwhelming. The sequoia remained the focus of most of the study, and for more than one hundred years, the big trees had their own constituency. As the NPS recognized how closely its fate was tied to public opinion, officials finally looked for accommodation with the enthusiastic advocates of parks and the environment who emerged in the 1960s.⁶⁵

Even suppression's most avid proponents acknowledged that it had been a dangerous strategy. More than thirty years of application showed that it worked best when money and manpower were abundant. The New Deal and MISSION 66 made suppression viable, but only temporarily. And it continually created problems. High levels of fuel loads, first noticed by Colonel John White in the 1920s, resulted from suppression and the results of the fuel-driven blazes could be catastrophic. Some agencies could live with the consequences of such overwhelming fires, but the National Park Service could not. The iconography of the parks was so significant in the mid-century United States that large swaths of apparent destruction inside their boundaries seemed a rebuke of democracy. Even more, out-of-control fires threatened people and damaged valuable resorts, hotels, and other commercial property as well as NPS facilities. After the Leopold Report, a change in strategy became hard to resist but suppression persisted.

Yosemite, moving toward the center of intellectual revolution that Biswell spawned, maintained the existing method of fire suppression even as the Berkeley professor's students engaged in the research that revolutionized the field. Yosemite emphasized education; it trained 1,181 children in fire safety in its junior ranger program in 1966 alone. That year, the number of human-induced fires in Yosemite grew remarkably, from thirteen in 1965 to forty-one. The decade-long average had been sixteen. Attributing the increase to a greater number of fires started by cigarette smokers in heavily trafficked areas, the park stepped up its prevention programs, added new patrols, and increased the number of fire prevention posters and "high fire hazard" posters and signs throughout the heavily trafficked areas of the park. Signs along roads

⁶⁴ Bob Linn, email to Hal Rothman, February 11, 2004, copy possession of the author; Sellars, *Preserving Nature in the National Parks*, 255-56; Kilgore interview, February 16, 2004; Agee interview, June 10, 2004.

⁶⁵ Lary M. Dilsaver and William C. Tweed, *Challenge of the Big Trees: A Resource History of Sequoia and Kings Canyon National Parks* (Three Rivers, CA: Sequoia Natural History Association, 1900), 263-65; Sellars, *Natural Resource Management in the National Parks*, 257; Foresta, *America's National Parks and Their Keepers*, 68-74.

and trails that exclaimed “no smoking while traveling” provided another warning.⁶⁶ At this most pivotal of national parks, suppression remained the dominant policy a full three years after the Leopold Report was issued.

The annual fire season always brought suppression advocates to the fore, and the Northern Rockies usually provided the most dramatic test case. The region had been quiescent since the end of the New Deal, in no small part as the result of the application of federally funded fire-fighting resources. Infrastructural developments contributed as well. The Forest Service’s Remount Depot supplied the countless pack mules essential to fire control, and the widespread use of aircraft, which not only allowed cargo to be dropped in remote mountain valleys, but also allowed smokejumpers to be dropped onto the perimeter of any fire, provided powerful examples. Airplanes also were used in experiments with dropping chemical agents on fire, offering another approach to fire control.⁶⁷ If fire could truly be tamed, it would have to be in the Northern Rockies, as only the conquest of this dramatic center of American fire would thoroughly prove the ongoing viability of suppression as a strategy.

In 1967, the Northern Rockies experienced a brutal fire season that reminded the NPS that the region was dangerous fire country. Beginning in July, fire broke out throughout the Northern Rockies and the Inland Empire, as the intermountain area in Idaho and Montana was called. More than 5,000 fires were reported, and more than thirty exceeded 1,000 acres in size. On July 12, 131 fires burned until they were doused by rain; on August 9, 167 started; on September 6, ninety-seven more began, and on September 21, another 167 were recorded. Before the rains came in late September, lightning alone ignited more than 1,400 fires.

When the Northern Rockies burned, Glacier National Park always was a critical concern. During the spring, fire was far from the minds of park staff and regional officials. Instead, they worried about a repeat of the dramatic floods of 1964. At 5,000 feet elevation in early May, the snow pack was 152 percent of normal. Even that late in the year, flooding seemed a more realistic threat to Glacier National Park than the prospect of fire. Precipitation up to the 3,000-foot elevation level had been about normal, and prolonged dry spells had not plagued the park. However, the snow melted slowly and the rains first diminished and then ended by mid-July. Through May and June, south slopes lost their snow mantle and began to dry. By mid-June, Glacier officials could see a crisis in the making. The situation only became worse. July, August, and September 1967 became the driest months that had occurred at West Glacier since the advent of record-keeping fifty-three years earlier. The precipitation of .98 of an inch was barely one-fifth of average.⁶⁸

Few parks were as well prepared for fire as Glacier, one of the most heavily burned places in the system. Coffman wrote his first fire plan for Glacier and the park’s fire-fighting preeminence had continued. Glacier also was one of the most heavily planned parks when it came to fire response. If the NPS wanted to demonstrate the viability of suppression once again, Glacier was as good a location as any.

⁶⁶ Forest Fire Control, 1966, 1-3, Yosemite National Park.

⁶⁷ Pyne, *Fire in America*, 256-57.

⁶⁸ “Glacier Fire Film, 1967, Glacier National Park, 1910-1984 Collection, 309-5; Glacier National Park Forest Fire Review, November 30-December 1, 1967” Glacier National Park, 1910-1984 Collection, 309-22.

During the evening of August 11, 1967, dry lightning that crossed the Continental Divide and continued in the early morning hours of August 12 inaugurated Glacier National Park's fire season. Fire spotters counted more than 100 ground strikes, the first at 6:25 p.m., with the first new fire reported at 7:05 p.m. The sparks started twenty new fires, burning in total more than 12,000 acres of timber. One of the most aggressive fires, the Flathead Fire, was discovered about halfway up the Apgar and Huckleberry mountains. The fuels of this fire were lodgepole-larch reproduction with heavy snags, the result of the major 1926 fire in the region. By early afternoon on August 17, the fire had spread to 650 acres. It doubled in size in the next seven hours, with a strong convection column angled up the slope. A cold front changed the direction of the wind, and by 10:30 p.m. on August 18, the fire had jumped the North Fork of the Flathead River, reaching the Flathead National Forest. It continued to spread downhill until August 20, when the center portion of the fire burned out and created two smaller fires, one on the northwest part of a ridge and the other on the southeast. By August 22, more the 4,645 acres of timber had burned.⁶⁹

The situation turned worse on August 23. The Weather Bureau issued a red flag weather alert, predicting that a weak Pacific frontal system passing through the area would bring high winds and dry lightning storms during the subsequent twenty-four hours. In response, the park tried to tie in bulldozer and hand-dug fire lines before the winds arrived. By 3:00 p.m., before the lines could be joined, the winds accelerated to between forty and sixty miles per hour. Firefighters were forced to retreat as the fire rapidly spread. Individual fires could be found as much as a half-mile in front of the main fire, with embers thrown ahead by the force of the wind. By the end of the day, another 3,500 acres of vegetation had burned.⁷⁰

Fires continued for another month, a result of the dry conditions, and when they came to an end, suppression advocates pointed to their successes. Throughout the Northern Rockies, fires had been controlled and a comparison with the terrible fires of 1910 highlighted a stunning contrast. Instead of the roughly 3 million acres of timber that burned in 1910, the 1967 fires only covered a total of 90,000 acres. Fatalities dropped from seventy-eight to three, with one resulting from a heart attack. Technology played an enormous role in this success. Aerial infrared scanners, oblivious to the smoke plumes that obscured vision, mapped fire perimeters. Fires that would have burned for days in 1910 were detected early and control efforts began within hours. Radio, telephone, and teletype networks provided instantaneous communications, allowing for immediate knowledge of new fires and coordinated responses. A national infrastructure also contributed to the 1967 success. The region was declared a national disaster area, and the federal Office of Emergency Preparedness joined in suppression efforts. Full closure of the national forests, a status akin to martial law, was enacted, keeping visitors away and limiting the chance of additional accidental fire. The response was impressive; the damage – with the exception of the 56,000-acre Sundance Fire in northern Idaho – was minimal. Suppression, most observers agreed, worked.⁷¹

However, a tone of exhaustion and impending doom permeated the accounts. Suppression advocates no longer trumpeted their successes with a vision that they were

⁶⁹ Glacier Fire Film, 1967, 3-6.

⁷⁰ Glacier Fire Film, 1967, 8-10.

⁷¹ Pyne, *Fire in America*, 257-59.

winning the fight. Instead, the fires of 1967 were another episode in a never-ending war against an opponent that could not be vanquished. The National Park Service finally recognized a hard reality: Fire would not go away; nor could it ever truly be suppressed. As long as the existing policies remained, the NPS would continue to invest ever-greater resources in an irresolvable conflict. Every year, it would have to scrounge for dollars and firefighters. Each successive season, the Service would recount the damages, savor any victories, lick its individual and collective wounds, and prepare for the next year.

The 1967 Glacier fires also subjected the National Park Service to severe criticism. Led by former U.S. Senator Burton Wheeler, D-Mt., a long-time nemesis of the Service, inholders charged that the NPS botched the management of one fire. It was a simple matter to put it out, some averred, and pointed to NPS mismanagement as the source of their losses. Such recriminations were typical in the aftermath of most fires, but Wheeler's status gave this set of attacks more serious ramifications.irate complainants ignored the other thirty-five fires in the park that summer as well as two bear maulings, but the criticism still stung. Even when the NPS provided suppression, it could still be chastised by an ungrateful public. The situation offered one more reason to break the cycle, and to consider new approaches to fire.

The vision of a new strategy was already extant. By 1967, the general tenor of scientific thinking about fire truly had changed. Fire had come to be seen as a natural force in an age that valued the concept of nature. To scientists such as Harold Biswell, suppression seemed outdated. MISSION 66 had provided a reprieve for the National Park Service; its injection of resources breathed new life into the strategy, but the program could not counteract the problem of the eternal struggles, and throwing resources at fire did not take into account the change in the general direction of thinking. Changes in the Service and in science combined to demand a new approach. Even as the Northern Rockies grappled with 1967 fire season, the end of the era of suppression was at hand.



Figure 1: Ranger Cecil Metcalf and Superintendent John R. White confer as an unidentified man looks on during an early National Park Service controlled burn at Sequoia National Park during the 1920s. Courtesy National Archives, Washington, D.C.



Figure 2: Superintendent John R. White monitoring a backfire on the Cold Springs Trail in Sequoia National Park during a 1920s experiment in prescribed burning. Courtesy National Archives, Washington, D.C.



Figure 3: Commissary for 200 men set up near the scene of an August 1928 fire at Merced Grove, Yosemite National Park. Courtesy, National Park Service, Yosemite National Park.



Figure 4: Mack Fire Truck, with Half Dome in the background. Sept. 1, 1931. Courtesy, National Park Service, Yosemite National Park.



Figure 5: Portable fire pump, 1925. Courtesy, National Park Service, Yosemite National Park.



Figure 6: Ranger and fire equipment. Courtesy, National Park Service, Yosemite National Park.



Figure 7: (L) William Colony.
Courtesy National Park Service,
Glacier National Park photo archives.

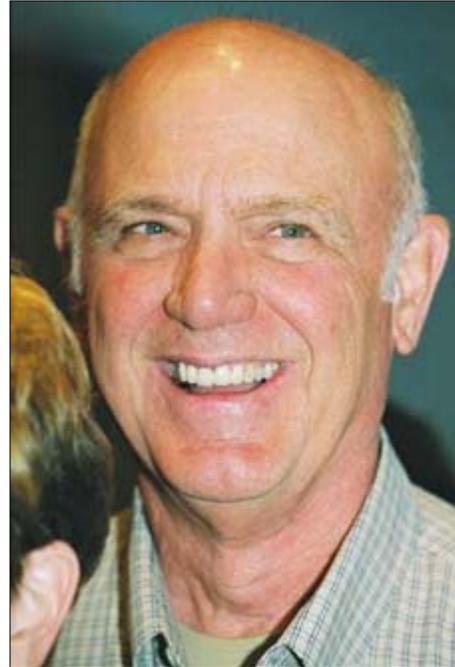


Figure 8: (R) Dr. Jan van Wagtenonk
Courtesy Jan van Wagtenonk



Figure 9: Dr. Jan van Wagtenonk and NPS Fire Ecologist Caroline Nobel on a wilderness burn in Yosemite National Park. Courtesy Jan van Wagtenonk.



Figure 10: Jim Cook. Courtesy of Jim Cook.



Figure 11: Jan van Wagtendonk and Dr. Harold Biswell during the first prescribed burn in Yosemite National Park. Courtesy Jan van Wagtendonk.



Figure 12: Dr. Harold Biswell. Courtesy Jan van Wagtendonk

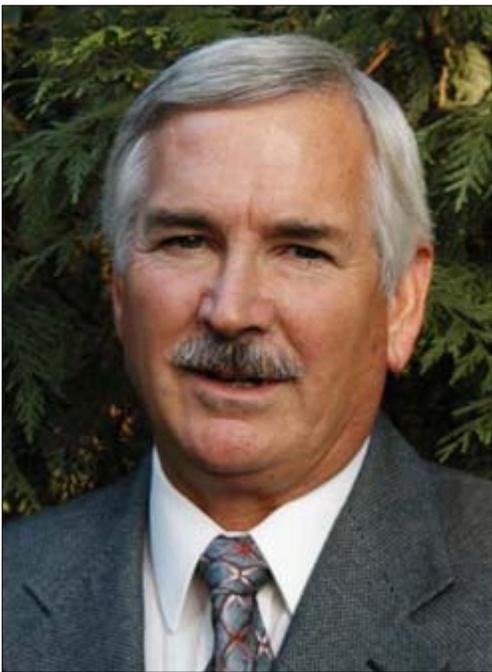


Figure 13: Jim Agee. Courtesy Jim Agee.



Figure 14: Lawrence Cook. Courtesy National Park Service, Harpers Ferry Center Historic Photo Collection.



Figure 15: John Coffman. Courtesy National Park Service, Harpers Ferry Center, Historic Photo Collection.

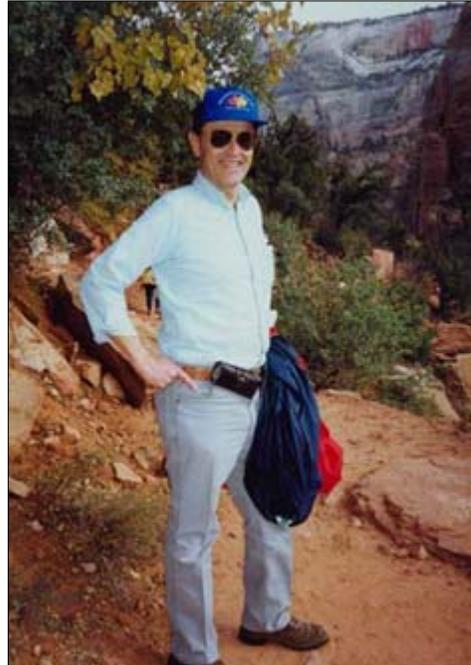


Figure 16: Bruce Kilgore, Zion National Park, 1991. Courtesy Bruce Kilgore.

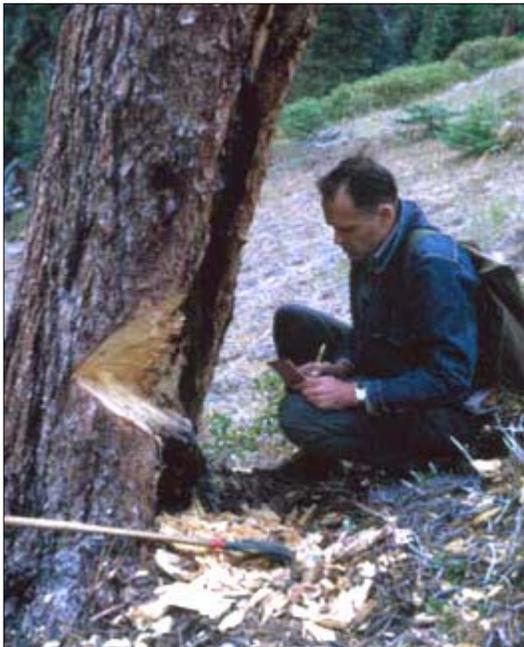


Figure 17: Bruce Kilgore in 1968, studying fire scars on Ponderosa Pine after Harold Weaver prepared wedge in tree using an older, higher impact technique. Picture by Harold Weaver. Courtesy Bruce Kilgore.



Figure 18: Elaine and Bruce Kilgore, Pocatello, Idaho, 2002. Courtesy Bruce Kilgore.



Figure 19: Meeting at Whitaker's Forest, UC Berkeley Experimental Forest, adjacent to Sequoia National Park, July 24, 2003. From left, Jim Agee, University of Washington – Forestry; Scott Stephens, UC Berkeley – Forestry; Nate Stephenson, former scientist at SEKI; Jan van Wagtendonk, USGS Yosemite National Park; Hayle Buchanan, Weber State University; Bruce Kilgore, retired NPS; Frieder Schorr, UC Berkeley. Courtesy Bruce Kilgore.

Part II:
Put Fire Back In . . .
But When, Where, and How?

Chapter 5:

Allowing Fire in the National Park System

“The presence or absence of natural fire within a given habitat is recognized as one of the ecological factors contributing to the perpetuation of plants and animals native to that habitat,” attested page 17 of the 1968 *Administrative Policies for Natural Areas in the National Park System*, the “Green Book” that compiled the administrative and management policies for NPS natural areas. Fires would be allowed to “run their course” when fire remained within pre-established boundaries and such burning contributed to management objectives. Similar changes appeared in the Blue and Red books, the Service policies for recreation and historic areas. This was indeed a revolution, a complete restructuring of the National Park Service’s approach to fire. After fifty-one years of NPS history and nearly a century of reliance on fire suppression in the national parks, the National Park Service embraced a new vision of the role of fire and the obligations of managers in the national parks.¹

Those few understated sentences that described this new policy did not do justice to the immensity of the transformation that implementation required. For almost 100 years, the goal of U.S. land management agencies had been to put out every fire in every national park, indeed every fire on public land in the United States, as quickly as possible. Not only did the new policy discourage suppression, it actively encouraged prescribed burning, the intentional setting of fire to achieve natural resource management objectives. The very idea that the NPS would initiate fire to craft landscapes to its objectives struck many as veritable heresy. Fire had been the enemy for so long that the concept that it could be a useful tool offended the sensibilities of generations of NPS staffers. Anyone who opened the Green Book could see that a new era in management had begun; suppression was no longer the singular goal of NPS fire policy.

The introduction of fire as a tool in NPS policy reflected larger changes in federal philosophies and in American society in general. Federal land management underwent radical revisions in the 1960s, first in a response to an energized and sometimes intransigent public and then as new congressional statutes transformed the climate in which federal agencies managed. The generation-long pressure for wilderness preservation that began with Howard Zahniser and The Wilderness Society and David Brower and the Sierra Club generated a spate of new legislation at precisely the moment that the wider public embraced the new set of values labeled “environmentalism.” This remarkably concentrated period of lawmaking gathered momentum throughout the 1950s and reached an initial peak with the passage of the Wilderness Act in 1964. It culminated

¹ National Park Service, *Administrative Policies for Natural Areas of the National Park System* (Washington, D.C.: US Government Printing Office, 1968), 17; National Park Service, *Administrative Policies for Recreation Areas of the National Park System* (Washington, D.C.: U.S. Government Printing Office, 1968), 20-21; National Park Service, *Administrative Policies for Historical Areas of the National Park System* (Washington, D.C.: U.S. Government Printing Office, 1968), 20, 36. 60.

in the National Environmental Policy Act of 1970 and the Endangered Species Act (ESA) in 1973 and continued through the five-year reauthorization of the ESA in 1978. During this fourteen-year heyday, the rules by which federal agencies governed public resources changed dramatically, allowing for far greater public input and much more sustained compliance activity. The geometry of federal fire management changed as a result, creating new alliances for the NPS and putting the historically dominant U.S. Forest Service on the defensive. The results affected federal fire policies in dramatic ways.²

The impact on fire management was enormous. As environmentalism became part of the national language and the nation confronted the “Quiet Crisis,” as Secretary of the Interior Stewart Udall labeled looming questions about the quality of the physical environment in 1963, federal agencies broadened their approach to fire. The Boise Interagency Fire Center was established in 1969 to unite the Bureau of Land Management’s developing fire expertise with the existing prowess of the Forest Service. The result was a higher level of interagency cooperation that led participants in new directions. The Forest Service soon modified its suppression policy, initiating natural fire experiments in 1972 that began a change in direction that followed the NPS. Soon after, the move to integrate fire activities among federal agencies gained more momentum. The National Wildfire Coordinating Group first met in 1973, tasked to bring every aspect of fire management, including multi-agency fire planning and training, under one standardized rubric. In 1974, this culminated in the doctrine of total mobility that allowed firefighting resources, especially crews, to be used by any agency anywhere. Prior to 1974, each agency had its own standards and could only accept crews and resources that met those standards. Because of a memo of understanding between the secretaries of Agriculture and Interior, the agencies worked toward a common standard, furthering the cooperation essential to response.³

With its bold and at the time idiosyncratic change in policy, the National Park Service moved to the forefront in fire management. At no time since the introduction of fire suppression in Yellowstone in the 1870s had the national parks led the way to new fire policy. Since its inception and especially after the fires of 1910, the Forest Service became and remained the agency that defined the federal response to fire. In this dominant role, that agency hewed to the vision of total suppression it developed in response to its values and the conditions it faced. In the 1960s, the National Park Service tentatively began to go its own way. Other federal land management agencies followed. In envisioning fire management in a new way, the national parks again mattered in fire management – for the first time in almost a century.

² Hal K. Rothman, *The Greening of a Nation? Environmentalism in the US Since 1945* (Ft. Worth: Harbrace Books, 1997), 161-77; David A. Adams, *Renewable Resource Policy: The Legal Institutional Foundations* (Washington, D.C.: Island Press, 1993), 158-63; Walter A. Rosenbaum, *The Politics of Environmental Concern*, 2d ed. (New York: Holt, Rinehart, and Winston, 1977), 48-55, 117-23; Samuel P. Hays, *Beauty, Health, and Permanence: Environmental Politics in the United States, 1955-1985* (Cambridge: Cambridge University Press, 1987), 1-25.

³ Boise Interagency Fire Agency, “The History of the Boise Interagency Fire Center,” BIFC 1989, 1-3; Stephen J. Pyne, *Fire in America: A Cultural History of Rural and Wildland Fire* (Princeton: Princeton University Press, 1982), 289-94; David Carle, *Burning Questions: America’s Fight with Nature’s Fire* (Westport, CT: Praeger Press, 2002), 139-52; Stewart Udall, *The Quiet Crisis* (New York: Holt, Rinehart, and Winston, 1963).

The National Park Service could not entirely claim as its own the revolution in thinking that reintroduced fire into its parks. Although science had become more important to the NPS, a considerable body of research – much of it from outside the federal government – created the important intellectual rationale that underpinned this radical policy shift. This science-based foundation for fire use accelerated the disintegration of the suppression model. As the Forest Service clung to what increasingly seemed a retrograde vision based on suppression, that agency's dominance of fire research waned. Well before the NPS implemented its new administrative policy in 1968, articulate challengers to the suppression ethos such as A. Starker Leopold, John S. McLaughlin, superintendent of Yellowstone and later Sequoia National Parks, and scientist Bruce Kilgore argued for a stronger role for science in determining the fire management objectives.⁴

Many of these challengers found Tall Timbers Research Station (TTRS), the privately endowed research institution north of Tallahassee, Florida, a catalyst for spreading their ideas. Tall Timbers played an instrumental role in fire research, sponsoring annual fire ecology conferences beginning in 1962. The first such meeting advocated a biological role for fire and offered controlled burning as a technique for land management – revolutionary ideas at the time that had been applied mostly in the Southeast. TTRS was privately funded and not beholden to the Forest Service or any other federal agency. The research it sponsored and published provided an alternative to the USFS suppression model, which focused on techniques of fire suppression and encompassed nearly all federally funded fire research. TTRS research opened the door, and others took up the call for scientific research into fire.⁵

The National Park Service was more receptive to the new guidelines than its peer land management agencies. The NPS was already in the throes of change, and its front-line personnel were being transformed. The old generalists – the people who grew up with the national park system – were reaching retirement age, and their successors very often were college graduates with a specialization that served NPS goals. Expertise in wildlife biology began to supersede training in forestry as a prerequisite for a position in natural resource management. The climate in which fire management policies was determined also had begun to shift. The 1963 Leopold Report on wildlife in the national parks provided important support for the new ethos, a stance that was more committed to ecology than to the facilities development that characterized the NPS throughout most of its first fifty years. The report recommended that the Service “recognize the enormous complexity of ecological communities and the diversity of management procedures required to preserve them.” It suggested a need to reinstate fire in the national parks, arguing for prescribed burning. Scientific research was to be the basis for all management programs. The National Academy of Sciences Robbins Report that same year extended that vision, advocating a separate research arm to complement the Service's distinctive mission. It took a long time for the NPS to implement this concept, but its very existence spoke volumes about the change in philosophy inside the National Park Service.⁶

⁴ Pyne, *Fire in America*, 292-94; Carle, *Burning Questions*, 133-43.

⁵ Pyne, *Fire in America*, 490-95.

⁶ Richard Sellars, *Preserving Nature in the National Parks* (New Haven: Yale University Press, 1997), 214-20; Alfred Runte, Jr., *National Parks: The American Experience*, 2d ed (Lincoln: University of Nebraska Press, 1987), 198-201; Pyne, *Fire in America*, 301-04.

Espousing a different creed than comparable land management agencies, the NPS looked to its own larger natural resource management agenda rather than the Forest Service's vision of fire. Stemming from the two major scientific reports on national parks of the era – no less an observer of the resource management scene than NPS historian Richard West Sellars has called them “threshold documents” – the scientific use of fire fell neatly under the developing rubric of resource management.⁷ This had an unexpected benefit: it separated the new vision of fire from the NPS's historic practices, allowing innovation to take place with a minimum of direct challenge to the status quo.

Innovation also allowed the National Park Service to stake out specific terrain within discussions about fire. Despite the largely defensive response of the NPS to the recommendations of the Robbins Report and the desire of some to keep it from public distribution, the report's recommendations did allow the NPS to incorporate the study of the biology of fire into its management regime. Such an approach to fire represented an important shift away from the standard Forest Service model of exploring solely the physical equations of fire behavior.⁸ The National Park Service soon came to study the impact of fire rather than to assess ways of stopping it.

The Leopold Report simultaneously served as a structure for maintaining NPS prerogative over park management. Although fire had been a side issue in the report, ostensibly devoted to the ongoing elk crisis in Yellowstone, the Leopold Report's vision of natural resource management loomed larger as new federal statutes began to affect the NPS. In 1964, passage of the Wilderness Act concerned NPS leaders, who saw in the new law's provisions the abrogation of their management prerogative. It complicated NPS obligations and offered only expensive mandates that came without funding. The National Park Service was at best lukewarm about the bill, lending only nominal support to its passage. During the 1960s and early 1970s, NPS officials watched as wilderness advocates attacked the Forest Service over questions of sustained timber yield and wild land. They recognized their own vulnerability and sought an alternative strategy. The Leopold report provided an alternative to imposed wilderness standards that let the NPS keep the administrative discretion that formal wilderness designation overrode. Its influence on resource management planning offered an avenue to preempt the statutory emphasis on wilderness. Faced with two new philosophies about which it was ambivalent, the National Park Service embraced the Leopold Report over the Wilderness Act.⁹ National Park Service discomfort with the restrictions perceived in the wilderness designation helped preempt its acceptance of the USFS fire suppression model, and by melding resource management and strategic goals, anticipated the direction that most fire management soon followed.

⁷ Sellars, *Preserving Nature in the National Parks*, 214; Pyne *Fire in America*, 301-02

⁸ Sellars, *Preserving Nature in the National Parks*, 216-17; Pyne, *Fire in America*, 302.

⁹ Paul W. Hirt, *A Conspiracy of Optimism: Management of the National Forests Since World War II* (Lincoln: University of Nebraska Press, 1994), 266-84; USDA Forest Service, *RARE II: A Quest for Balance in Public Lands* (Washington, D.C.: U.S. Government Printing Office, 1978); M. Rupert Cutler, “National Forests in the Balance,” *American Forests* (May 1978), 1-5; M. Rupert Cutler, *Western Wildlands: A Natural Resource Journal* 5 (Summer 1978); Tim Mahoney, “RARE Draft EIS Sparks Heavy Input from Conservationists,” *Wilderness Report* 15 (September 1978); David Crosson, “RARE Results Final ‘An Acute Disappointment,’” *High Country News*, January 12, 1979; Sellars, *Preserving Nature in the National Parks*, 217-18; Pyne, *Fire in America*, 303; George B. Hartzog, Jr., *Battling for the National Parks* (Mt. Kisco, NY: Moyer Bell Limited, 1988), 96-107; Ronald A. Foresta, *America's National Parks and Their Keepers* (Washington, D.C.: Resources for the Future, 1984), 69-70.

This shift toward a new vision of fire guaranteed an important change in who managed different dimensions of fire. In the model inherited from the Forest Service, most fire staff in the NPS had been trained as foresters. After the Leopold Report, wildlife biologists – often students of its primary author, A. Starker Leopold – entered the NPS, and following the broad outlines of Leopold’s work, began to blend fire with wildlife policy. These new professionals drew the National Park Service toward a primacy for science for a brief moment that lasted roughly from the unveiling of the Leopold Report in 1963 until the aftermath of the Stoneman Meadows incident in Yosemite on July 4, 1970, when law enforcement – people management – began to dominate NPS horizons. These science-oriented researchers helped create a model for intra-agency research and even helped place fire science into the matrix of federal research. They communicated easily with peers in other agencies, recognizing that the physical boundaries that divided jurisdictions had little to do with ecological reality.

The influx of wildlife biologists paralleled the gradual departure of foresters from the NPS. As fire ecology competed with forestry as the model of fire management, the position of *forester* nearly disappeared from the National Park Service, and along with it, ties to colleagues in the USFS and forestry in general. Attrition accounted for a good portion of this change. As hiring patterns shifted beginning in the 1950s, NPS foresters as a group grew older while their recently trained successors were younger and thought differently. Over time, the change in personnel moved fire management and ecology ever closer to what would later be called ecosystem management.

During the brief moment in National Park Service history when the influence of science was at its peak, fire research enjoyed a malleability and viability that had never before been possible. Even as Tall Timbers challenged the dominant Forest Service research vision, the NPS cultivated its own fire management program. This coincided with the new enthusiasm for science within the NPS. Mission 66 led to bold requests for other kinds of funding. A push to fund scientific research with a line item in the NPS budget led to a 250 percent increase in funding in 1964 as well as an increase in the number of scientists hired by the Service. Director George B. Hartzog’s support of biological and fire research also contributed to the improved climate. In 1968, for only the third time in thirty years, NPS research scientists met to review their overall situation, to share research and ideas, and to promote a more comprehensive science program in the Service. NPS Chief Scientist Robert Linn recruited a group from inside and outside the Service, some of whom the NPS promptly sent back to school to do master’s work in science. In a typical instance, Jim Larson, who had been an interpretive ranger, was recruited to become a science coordinator. Larson returned to the University of Washington, where he completed an MA in science, before returning and continuing a long NPS career. These “retread rangers,” as one of their contemporaries recalled them with a smile, helped transform NPS’s science programs. With Linn leading the effort, science, in particular fire research, found new prominence in the National Park System.¹⁰

NPS fire research, built from the Everglades studies of the early 1950s, expanded to the national parks in California. The critical experiments in the Golden State started at

¹⁰ Lowell Sumner, “A History of the Office of Natural Science Studies,” 1-6; Robert Linn, “Postscript: Current Happenings,” in *Proceedings of the Meeting of Research Scientists and Management Biologists of the National Park Service*, Horace M. Albright Training Center, Grand Canyon National Park, April 6-8, 1968, copy provided by Robert Linn; James Agee, interview by Hal K. Rothman, June 10, 2004.

Sequoia and Kings Canyon National Park, where researchers examined the indispensable role of fire in sequoia regeneration and the threats posed by fuel buildup to the mature “Big Trees.”¹¹ In essence, the rationale that underpinned the start of fire research in the Southeast easily transferred to California. The need for fire to protect a specific and desirable species of tree— the longleaf pine in the Southeast and the sequoia on the West Coast – had contributed to the development of fire research, which in turn, led to the implementation of the first NPS research program.

Despite the NPS’s interest in such programs, the emphasis on specific needs of individual tree species detracted from overall implementation of fire research. The desire to protect the sequoia hardly translated into an overall argument for the general use of fire, even if policy articulated such a stance. The result was slow program development. Although the Robbins Report argued vociferously for a separate NPS research arm, despite valuable research conducted inside the agency, this idea did not come to fruition quickly. In the National Park Service, scientists commenced a range of studies, staff members with training in science assumed roles under the new rubric of “resource management,” and cooperative arrangements with universities brought a broader range of expertise to the parks. Fire research inside the NPS became part of resource management, valued as a practice for its ability to alter landscapes. Its ability to limit the damage from fires was not yet a primary consideration.

Leadership in thinking about uses of fire came from the highest levels of the National Park Service. Located in the Washington office as a senior staff person in the Natural Resources Branch, Lyle McDowell played an instrumental role in creating the context in which fire became a tool for resource management. In charge of the development of resource management plans throughout the park system, McDowell embraced a new vision of the role of fire and resource management. “Lyle deserves a lot of the credit,” observed Robert Barbee, who rose through resource management to become superintendent of Yellowstone. “He was sort of the taskmaster for the Washington office who was pretty much directing things over all.” McDowell “bought the Leopold report philosophically and he was trying to translate it into practical action,” Barbee recalled. McDowell championed the “return to school” program that sent Barbee and countless others back for specialized post-graduate training; “he was a loquacious fellow,” Barbee remembered. “He used to come out to the college out there [at Colorado State University] and we’d sit in his motel room and he’d lecture us about the things we needed to be lectured about.” His resource management plan was the first to conceptualize fire as a useful tool for management, creating the context in which researchers such as Biswell and Richard Hartesveldt of San Jose State College could conduct experiments.¹²

The resulting changes accelerated the interest in fire research. The National Park Service could legitimately regard itself as a leader in process when in 1970, the National Science Foundation (NSF) sponsored special research on fire ecology. The NSF, the leading funding agency for research, had never before funded work that studied fire ecology. Academic research now included the kind of work the National Park Service

¹¹ Harold H. Biswell, *Prescribed Burning in California Wildlands Vegetation Management* (Berkeley: University of California Press, 1989), 58-59; Pyne, *Fire in America*, 302.

¹² James Agee, interview by Hal Rothman, June 10, 2004; Robert Barbee, interview by Hal K. Rothman, Part 1, November 12, 2004.

played a major role in initiating. With the introduction of fire as a new tool, the NPS had changed the terms of the discussion. New values were applied to the question of fire. The NSF affirmed the shift that took fire policy from the Forest Service emphasis on research into fire behavior that was considered vital to better control wildfires and into ecological studies that emphasized the value of fire in many ecosystems. Acceptance of this perspective meant that the use of fire as a serious management tool was only a short step away. Although science played an important role in the planning and policy of federal agencies, such policies followed a shift in values. Scientific research substantiated that shift, leading to a convergence of new ideas, empirical demonstration, and a change in perception.

**

When the National Park Service ceased its efforts to suppress every fire in a national park, it upended the rationale and logic that had governed fire for more than one-half century. The path to the 1968 policy change was long and convoluted, for it represented a substantial change not only in the way the Service treated fire, but in the explanations NPS officials offered their constituents, Congress, and the press. NPS representatives argued that the National Park Service's obligations were different from those of other federal agencies, including the Forest Service and Bureau of Land Management lands, and other categories of federal land holdings. The influential Leopold and Robbins reports advocated a science-based approach to management that powerful constituencies embraced. Bruce Kilgore served as editor of *National Parks* magazine and later became editor of the *Sierra Club Bulletin*, where he published the Leopold report in its entirety. The Sierra Club "thought, as an entity, that [the Leopold Report] was one of the most outstanding contributions to the management of parks," he recalled. Kilgore believed that Leopold had "total support" from Secretary of the Interior Stewart Udall for the report, a circumstance Kilgore regarded as a determining factor in the report's implementation.¹³

Devising a new policy raised questions that the National Park Service Washington, D.C., office quickly tried to address. As momentum for the introduction of fire as a management tool increased, advocates of the traditional suppression policy forcefully reminded everyone that until a formal administrative change took place, suppression remained NPS policy. Talk of a new vision of fire management would not end suppression, Assistant Director Harthon Bill instructed NPS staff in 1967 in an effort to quell concerns about the impending change. He focused on one section of the NPS administrative manual that offered rationale for continuation of suppression: "all fires threatening the natural and cultural resources of a natural (historical, recreational) area shall be controlled and extinguished." Bill pointed out that "historically fire suppression has taken precedence over all other park activities except the safeguarding or saving of human life. This interpretation shall apply to the [use of fire] policy. . . . the word 'threatening' does not constitute authority for allowing natural fires to burn or to engage in prescribed or controlled burning."¹⁴ Even as plans for a new policy moved through the

¹³ Bruce Kilgore interview by Hal Rothman, February 16, 2004; Jan van Wagendonk, interview by Lesley Argo, June 13, 2002.

¹⁴ Assistant Director to Washington Office and All Field Offices, Resources Management, Fire Control Policy Interpretation, February 13, 1967, Everglades National Park, Forest Fires.

NPS bureaucracy, the importance of suppression as a strategy and a belief system could not be discounted.

For the National Park Service, the Leopold report had been the catalyst for rethinking fire, but the real energy that underpinned this sea change in philosophy emanated from Biswell's research. Students gravitated to him. One, Jan van Wagtendonk, had worked as a firefighter and a smokejumper in Oregon and Alaska. "It seemed silly to me," he recalled almost four decades later, "to be putting fires out in the tundra."¹⁵ After an undergraduate degree and time in the military, he arrived in Berkeley to study fire ecology.

Biswell played an instrumental role in the shift from theory to the practice of introducing fire. In 1964, Biswell himself received permission to begin Giant Sequoia restoration studies on a 320-acre University of California experimental tract, Whitaker's Forest, just west of Kings Canyon National Park. The Redwood Mountain grove of the Big Trees extended into the forest from the national park, providing an unparalleled opportunity to study the impact on precisely the tree species and forest composition that existed within park boundaries.

Biswell found an environment that reflected a century of suppression. His estimates reported more than 22 tons of combustible material per acre. Beneath the largest trees, he found competition from more than 500 dead and standing small trees per acre, which Biswell determined resulted from the human suppression regime. He found an additional 900 living white firs and incense cedars, mostly between one and eleven feet in height. Wildlife was absent from the area because the dense material on the forest floor eliminated most underbrush and food plants. The fuel load was so great that 4-H Clubs had ceased to camp in the region for fear of wildfire.¹⁶

As Biswell's research showed, burning had a positive impact on the Big Trees. In a comprehensive program that began in 1964 and continued until 1975, Biswell, Richard Hartesveldt, Howard Shellhammer, Tom Harvey, and Ron Stecker studied the impacts of prescribed fire. Their work demonstrated that giant sequoias depended on fire for germination and early survival. The research supported "fire as a tool to sterilize the soil so the seedlings get back in the ground and rejuvenate," recalled William Briggie, who served as a ranger at Sequoia National Park during this era. Hartesveldt trenchantly observed that without fire, giant sequoias would become an endangered species.¹⁷

Biswell's efforts guided the NPS program at Yosemite as well. Robert Barbee, who considered the Leopold Report a "manifesto," visited Biswell at Berkeley "to lay some philosophical groundwork, some scientific expertise, for my resource management plan." Biswell agreed to see him and Barbee "figured I would get maybe fifteen or twenty minutes. So I got down there, and he was in his office, and he said 'well, let's go,'" Barbee recalled. "And I said 'where we going to go?' He said 'we can't sit here and talk about fire, we are going up to the experimental forest'" at Yosemite. The men spent the next two days at Yosemite exploring the prospects for introducing fire.¹⁸

¹⁵ Jan van Wagtendonk interview, June 13, 2002.

¹⁶ Carle, *Burning Questions*, 121-22.

¹⁷ William Briggie, Historical Interview, by Jennifer Bottomly, September 4, 2001, Glacier National Park Archives, Oral History Collection; Harold H. Biswell, "The Role of Fire in Maintaining Forest Wilderness Quality," unpublished paper, presented at the Second Annual California Plant and Soil Conference, American Society of Agronomy, California Chapter, Davis, CA, February 1, 1973, 7.

¹⁸ Robert Barbee interview, Part I, November 12, 2004.

Over a period of a little less than a decade, Biswell's fire experiments transformed Whitaker's Forest. By 1973, Biswell observed that burning had created a condition that more resembled historic time: Whitaker's Forest was more open and park-like, with fewer small trees. Shrubs and wildflowers returned and "the forest is becoming scenic," Biswell told a meeting of the American Society of Agronomy in 1973. Biswell saw this as validation of his vision. Even more telling, he held demonstration burns in August of that year, when much of the rest of the state endured withering wildfire or lived in constant fear of the next outbreak. His prescribed fires did not burn out of control, further substantiation of the viability of a pattern of controlled burning that limited the amount of available fuel during the most dangerous fire seasons. The use of fire, Biswell believed he had conclusively shown, allowed for better management of timber, a more "natural" environment, and significantly less intense wildfire if one erupted.¹⁹

Whitaker's Forest was just outside the boundary of Kings Canyon National Park, but crossing that arbitrary line on a map meant more than simply transversing physical space. The national parks, the nation's sacred spaces, remained inviolable from more than the encroachment of most human development. Fire remained an equally large taboo in the parks, and securing permission to burn within them was an elaborate and drawn-out process. After a National Parks Advisory Board visit to Kings Canyon in conjunction with the preparation of the National Academy of Sciences report, many of the obstacles against burning in the park diminished. Hartesveldt received a grant from the National Park Service for a five-year research study of controlled burning. He planned to begin with controlled burns on a number of two-acre plots in August 1964, but the initial burns were delayed until 1965 as he waited for ideal weather and climate conditions. Still, Hartesveldt insisted, "careful use of fire and cutting constitute a much more realistic approach than does a policy of 'hands off.'"²⁰

The addition of Bruce Kilgore as a research biologist at Sequoia and Kings Canyon National Park in March 1968 accelerated the burning program. Kilgore served in an unusual position. Although he was duty-stationed at Sequoia, Kilgore reported to Starker Leopold, who had taken a special appointment in Natural Resource Management from NPS Director George B. Hartzog, Jr. When Leopold hired Kilgore, the professor was "semi-kind of my boss. He was more of my philosophical boss." At Sequoia, Kilgore met another prominent fire researcher, Harry Schimke, who worked at the Stanislaus National Forest and was affiliated with the Pacific Southwest Forest and Range Experiment Station at Berkeley. An expert in fire behavior, Schimke served as a combination conscience and advisor for those who contemplated changing the way the National Park Service addressed fire.²¹

The initial experiment in Sequoia and Kings Canyon began a revolution in the national parks. While most of the National Park Service's prescribed burning acreage was in Everglades National Park, the California parks engendered more controversy. The intensity of debate had begun in the turn-of-the-twentieth century light burning controversy in the California forests and continued largely outside the federal land

¹⁹ Biswell, "The Role of Fire in Maintaining Forest Wilderness Quality," 7; Biswell, *Prescribed Burning*, 109-11; James Agee interview, June 10, 2004.

²⁰ Richard J. Hartesveldt, "Fire Ecology of the Giant Sequoias," *Natural History* (December 1964), 12-19; James Agee interview, June 10, 2004.

²¹ Bruce Kilgore interview, February 16, 2004; Carle, *Burning Questions*, 123, 139.

management system. The insistence of the Forest Service on suppression and that agency's predominance in the West also fueled greater interest. In California and elsewhere west of the Rocky Mountains, allowing fire to burn was big news.

Sequoia and Kings Canyon National Park instituted a policy that allowed lightning fires to burn in areas designated as appropriate for wildfire. When the first lightning-ignited fire allowed to burn in any national park occurred on Kennedy Ridge in 1968, Schimke was among those who watched. His sense of the fire's potential reach and the park's ability to control it made this difficult experience easier for park staff. The term "let burn" was assigned to such fires, but was soon changed. The idea of letting fires burn seemed too casual for public consumption and such fires were designated with the more palatable term, "prescribed natural fire." Even that term was controversial; in May 1971, Superintendent John McLaughlin of Sequoia and Kings Canyon, described by Robert Barbee as "a thinker and really quite an admirable character," instructed his staff to avoid the term "prescribed burn." Instead, he advocated the phrase "putting the role of fire back in the environment." Typically the selected burn areas were far from homes, roads, and visitor services. Natural fires in them were reported and watched, usually by airplane, but allowed to burn as long as they did not exceed the boundaries of the designated area or threaten facilities. Some areas were so remote that one observer noted that if a fire got away, "no one would ever notice."²²

Intentionally set fires were far more controversial for the National Park Service. Despite much confusion over the meaning of terms – with loose definitions prevailing, prescribed burning described activities as different as burning sawgrass in Everglades or burning small trees and brush beneath sequoias in California – prescribed burning grew in importance. It also was terribly difficult to implement. Heavily traveled or developed areas were not suitable for the idea of "letting fire run its course." The risks were too great: lives and property were at stake, even when lightning fires were allowed to burn. So before fire could be introduced as a tool in sensitive areas such as the Giant Sequoia groves or in similar places, considerable education and preparation had to take place. Initially, no clear separation of the ideas of prescribed fire and natural prescribed fire – natural fire that was allowed to burn because it served NPS purposes – had yet been devised. As a result, the NPS prepared lands for natural fire with the idea that they might be prescribed burned if nature did not cooperate. In an early experiment in 1969, along the western boundary of the Redwood Mountain grove of giant sequoias, hand-built fire lines were used to reduce fuel in anticipation of allowing natural fires to burn in a particular zone. Workers felled dead standing trees and cleared away underbrush and saplings around some of the big trees. Powerful hoses were kept near the fire lines in case fire moved outside those designated areas.²³ It seemed to some that securing conditions under which a controlled burn could take place required more effort than the burn itself.

Creating a reduced fuel zone demanded considerable effort. Typically, NPS crews burned a narrow strip to create a fuel break, usually near the top of a ridge. Workers then would drop down the side of the ridge about fifteen feet and use drip torches, ignition devices used to back burn or start prescribed fires, to burn upslope, and the fire would go

²² Carle, *Burning Questions*, 140-41; John S. McLaughlin, Memorandum from the Superintendent, May 18, 1971, Sequoia National Park Archives, Fire Records, Box 191 F1; Robert Barbee interview, Part I, November 12, 2004.

²³ Bruce Kilgore interview, February 16, 2004.

out when it reached the burned area above. The process would be repeated another fifteen feet down the slope. This was tedious, time-consuming, and difficult work, and everyone who engaged in it thought of ways to make it easier; few succeeded. In one effort to speed up the process on an August 1969 burn, Fire Control Officer John Bowdler allowed a crew to burn a larger section as a single strip instead of dividing it up into smaller sections. The fire started slowly, but gained speed and intensity as it charged uphill. Beneath some giant sequoias, the flames jumped as high as three times their previous height, with the heat damaging some of the tree's lowest branches. The experience of what came to be known as the "Bowdler Burn" reminded everyone of the difficulty of managing fire even in controlled circumstances.²⁴

The creation of the new policy neither included resources nor supported a system of implementation; nor did it clearly describe parameters. The policy was an objective, the articulation of a larger ideal with little practical instruction for its execution. Little Service-wide coordination of the new policy ensued, for the combination of resources, leadership, and acceptance of the values it embodied were not found in the NPS in 1968. "It was just one of those things that developed topsy-turvy," James Agee recalled.²⁵ Park units proceeded with fire planning in an individualized manner, simultaneously an advantage and a drawback in instituting the new policy across the NPS. The immediate response was to consign the use of fire as a tool to resource management, effectively separating its use from traditional activities such as its prevention.

The change in the Green Book scrapped the centralized control of fire that stemmed from Coffman and the New Deal era, replacing it with something that more closely fit the 1960s. The regional offices and park units received little guidance about what the new policy demanded of them. Implementation fell most often to superintendents; their varying commitment to the idea of fire as a tool played an enormous role in the ways in which fire was introduced to national parks. Superintendents and their staffs could design fire programs that fit the specific needs of their park without much intervention from the national level or they could choose to ignore the new policy. The variety of types of units in the national park system further complicated any standardization of the response. The use of fire appeared in each of three NPS books of administrative policies, but the differences in types of areas created considerable variety in application. While recreational areas were governed by a policy that reflected the standards of the natural areas, historical areas functioned under more complex guidelines that emphasized extinguishing fires that threatened cultural resources, but encouraged prescribed burning. As a result, the revolution in fire management left cultural resources entirely out of the picture. It was as if National Park Service leaders believed that wildfires only occurred in natural areas.²⁶

The justification for promoting fire was that it was "natural," a construction that became problematic. Some critics and internal advocates accepted prescribed natural fires, not their intentionally ignited equivalent, because they often regarded fire in

²⁴ Carle, *Burning Questions*, 140-41.

²⁵ James Agee interview, June 10, 2004.

²⁶ Richard Rogers Summer, "The Administration of Fire Management within the National Park Service," (MA thesis, California State University, Fullerton, 1978), 1-3; National Park Service, *Administrative Policies for Natural Areas of the National Park System*, 17; National Park Service, *Administrative Policies for Recreation Areas of the National Park System*, 20; National Park Service, *Administrative Policies for Historic Areas of the National Park System*, 36.

absolute terms: natural fires were good; human caused-fires were bad. This set of suppositions created problems, especially in the management of cultural landscapes and in natural areas that were in fact sculpted by fire. The era's proliferating fire conferences brought this question to the fore, and it was debated endlessly.²⁷

The idea of using fire challenged not only existing policy, but the core values of many seasoned National Park Service officials and staff. The use of fire as a tool represented a change not only in what they did, but in the value system that underpinned the Service. Such people "had a difficult time," Research Forester Jan van Wagtendonk noted in 2002. "Their entire career and belief system [had been] based on putting fires out and a bunch of hippie Ph.D.s from Berkeley come along and say 'you got to let it burn.' It [was] hard for them to grapple with that idea." The absence of a comprehensive structure to support the new policy made this transition even more difficult. Not only was the policy hard to fathom and respect, no clear guidelines to make it palatable accompanied it.²⁸

The dual emphasis reflected an important tension created by the new policies. Fires that started by natural means were assigned to resource management units, effectively creating two distinct modes of addressing fire. Resource management framed its intellectual structure from wildlife biology, which regarded fire as an asset. Fire suppression had been managed by foresters in the National Park Service, the intellectual heirs to the suppression tradition John Coffman established. Coffman himself staunchly opposed prescribed burning in any form. "I was considered a no-burn man," Coffman proudly remembered in a 1973 interview. "Let nature take its course without fire." The wildlife biologists in resource management brought a different perspective, but the ongoing power of the suppression model and its many adherents limited the opportunity to apply new ideas. For controlled burning to play a prominent role in the National Park Service, a greater impetus than words on a page was essential.²⁹

The new fire policy demanded that the National Park Service's administrative structure accommodate a new vision of responsibility. The NPS's existing fire organization still derived from its New Deal roots. The Division of Forestry, headed by Forester Lawrence E. Cook, Coffman's successor, handled all fire operations and it shared in the culture of suppression and the accompanying ideas of fire protection and control. "The rumor was that Larry Cook said 'over my dead body' when he heard about any natural burning or prescribed burning," Kilgore recalled. An impasse resulted. The pressure for introducing fire had come from elsewhere in and outside the National Park Service, but the people who administered fire in the NPS remained staunch suppression advocates. Their opponents mainly were the wildlife biologists who had become prominent in resource management. A chaotic situation in which different entities within the NPS advocated different responses proved a dramatic shortcoming as officials sought to implement new ideas about fire. "There was a lot of friction," Kilgore remembered.³⁰

²⁷ These questions dominated the Tall Timbers fire research conferences in the mid-1960s and early 1970s; see *Tall Timbers Fire Ecology Conference Proceedings* (Tallahassee, FL: Tall Timbers Research Station, 1966-1976).

²⁸ Jan van Wagtendonk interview, June 13, 2002.

²⁹ John D. Coffman, "Forest Protection in the National Parks," interview by Amelia R. Fry, 1973 (Berkeley, CA, The Bancroft Library, 1973), 77-78.

³⁰ Bruce Kilgore interview, February 16, 2004.

The devolution of responsibility to the park level meant tremendous variation in implementation and unusual categories of reporting. Conventional fire management continued, implemented in the same way as it had always been: education, prevention, and response. Presuppression activities continued, and parks reported fires in the same classes of size – A, B, and C – that had been standard for a generation. The most notable addition to the many annual fire reports was a new category, “Use of Fire in Resources Management,” that reflected the new Green Book policy. “Fire was not used as a resource management tool this year” became a standard line in the annual fire report for many parks.³¹ It allowed the NPS to continue to function as it always had, as a fire suppression agency, while at the same time paying lip service to the new prescribed burn policy. The division between resource management and fire control provided ample distance between the two philosophies. The result was a complicated management structure that invested much of its resources in conventional modes of fire control while its intellectual energy, in the form of new researchers, was relegated to what seemed an exotic form of management. Fire as a tool for resource management remained something entirely different and much less significant than overall fire control.

The beginning of a Service-wide system resulted, but it was far from the ideal toward which the National Park Service strove. The NPS’s forestry division maintained responsibility for suppression and retained the funds allocated for that purpose. The use of fire as a management tool became a park-level prerogative that superintendents usually had to fund within their existing budgets. NPS culture long emphasized a strong line of central leadership that made policy but willingly delegated operations to the park level, creating clear precedent for leaving such decisions to the discretion of superintendents. Control of this prerogative followed an important trend in NPS history. For much of the early history of the Service, superintendents communicated directly with the Washington office and even with the director. By the 1960s, regional offices were well established as intermediaries, but park superintendents still wielded considerable power. In this respect, the implementation of fire policy at the park level was consistent with patterns of NPS management. At the same time, it represented a major shift: fire required vast resources and in the 1960s, individual parks had no more resources than they did three decades before. With the almost complete autonomy of implementation, fire policy created a transfer of power from the regions to the parks, a trend that ran against the general tenor of consolidation that marked the National Park Service during the late 1960s.

The parks faced a complicated, multi-faceted mission when it came to the new fire policy. In effect, suppression remained entrenched as NPS policy and the goals of the 1968 policy did little to entirely replace that strategy. Instead, most parks continued to maintain an active suppression program even as they grappled with the implications of prescribed burning. At Yellowstone in 1968, even after the change in the Green Book, the approach to fire remained largely unchanged. The park reported only sixteen fires, four of which resulted from human action. The park approached these fires in the same manner

³¹ Annual Fire Summary and Analysis, January 28, 1969, Grand Teton National Park; Annual Fire Summary and Analysis, January 14, 1970, Y2623, Fire Records, Box 1, (located in Law Enforcement Evidence Room), Grand Teton National Park; Annual Fire Summary and Analysis, Yellowstone National Park, January 25, 1970, Yellowstone National Park Archives, Y-214.

as it always had; prevention, education and training, and suppression of actual fire remained primary objectives.³²

The mechanisms that had long driven fire response remained primary at the park level. At Yellowstone, the emphasis on technological support for suppression remained the focus. Smokejumpers were seen as a viable response, with the West Yellowstone Interagency Air Operations Center activated on July 2, 1968. Smokejumpers made a total of fourteen jumps on five individual fires in the park in 1968. It was as if suppression adherents believed that new technology would allow them to overcome a policy they found noxious. Older resources such as fire lookouts continued to be used, with lookouts serving as the source of initial information for eleven of the park's sixteen fires. Despite the small number of fires in 1968, Yellowstone's numbers diverged from reporting trends at Yosemite National Park. At Yosemite, human-caused fires, both intentional and accidental, slightly outnumbered natural fires in 1968. Visitor reporting accounted for most of the sightings of fire, with lookouts and aircrafts playing a lesser role. But at Yosemite, the model remained as it had before the Green Book offered new guidelines, and little in its annual fire reports reflected any vision of the policy change.³³

At the regional and national levels, the new policy earned closer attention. The admonition to implement an ecologically based policy came from above the regional offices and was used to remind and even chastise superintendents. "While the Service continues to be vitally interested in the reduction of man-made fires, the value of natural fire as an ecological factor must be recognized," observed Merle E. Stitt, assistant regional director for operations in the Western Region in 1968 and an advocate of the use of fire. In the context of the annual fire report for the National Park Service, his statement represented a major shift in emphasis. Stitt modified the vision of suppression, limiting it to human-caused fires, explaining that the National Park Service policy encouraged natural fires for their reinvigorating effect on the natural environment. Noted Arizona State University fire historian and scholar Stephen J. Pyne, who as a young firefighter heard Stitt offer this prohibition at the Grand Canyon, observed that the change was confined to words. "Almost nothing happened on the ground," he recalled more than thirty years later. Whether this statement accurately reflected the actions at Grand Canyon, it did suggest that some of those intimately involved with fire felt the need for faster implementation of the revised policy.³⁴

Resource management plans soon reflected the new ethos. As statements of goals and objectives, they offered an ideal terrain to define new approaches to problems. The role of fire as a tool quickly cropped up in some of the most prominent parks. At Yellowstone, the 1970 resource management plan halfheartedly embraced the new ideals. The authors recognized that the existing principles by which the NPS managed fire were "developed in areas where timber is managed as a crop," a clear articulation of the differences between the National Park Service and the Forest Service. Yet fire posed a

³² "Annual Forestry Report, Yellowstone National Park, 1968," Yellowstone National Park Archives, Y-214, 1-3.

³³ *Ibid.*, "Summary 1968 Fire Season, Yosemite National Park, California," Yosemite National Park Archives, Y 14, Fire Season Summary 1968, 1-4.

³⁴ Assistant Regional Director, Operations Western Region to Superintendents, Western Region, March 24, 1969, Subject: Forest Fires, 1968, Yosemite National Park Archives, Y 14, Fire Season Summary 1968, 1-4; Bruce Kilgore interview, February 16, 2004; Steve Pyne, email correspondence with Hal K. Rothman, June 11, 2004, in possession of author.

conundrum. “Since we lack the fire control skills to stop fire at will,” the plan continued, “we can not fully adopt a program of allowable natural fires.” Some fires could be allowed to burn, the report proclaimed; others would have to be addressed in the conventional manner.³⁵

This bifurcation helped ease acceptance of the new policy. Fire was so deeply ingrained as an enemy that it was nearly impossible to expect NPS veterans to accept it as a tool, even in a limited way. The division worked equally well in that it separated people by their affinity. The wildlife biologists who began to take precedence worked in close concert with one another. At the same time, the National Park Service’s aging forestry cohort was as close-knit a group of professionals as any in the Service. Innovation could occur – within limits – even as traditional policies continued to be implemented.

The parks that took the lead in implementing the new policy typically had been influenced by Harold Biswell and his students. Sequoia, Kings Canyon, Yosemite, and other California parks were prominent in this picture. Sequoia had been central to fire management throughout most of the twentieth century. In 1955, the McGee fire just outside and around Grant Grove burned across 18,000 acres in the foothills. In 1960 and 1961, severe fires in the park and its vicinity spurred interest in new strategies. The Tunnel Rock fire near park headquarters in June and July 1960 raged over 4,960 acres, and its suppression cost \$884,931. In 1961, the Harlow fire, in the foothills of the Sierra Nevada just beyond Yosemite park boundaries, cost more than \$1 million and burned more than 43,000 acres of vegetation. In one two-hour period, the fire burned across 20,000 acres, caused two fatalities, and destroyed 105 structures. “This caused us to take another look,” Peter H. Schuft, who served as chief ranger at Sequoia and Kings Canyon, observed. “Maybe we should be spending more on planning ways to stop [fires] from starting or putting in fuel breaks (prepared during the off season) at which we could stop wild fires from spreading.” The expansion of fuel breaks in Sequoia and Kings Canyon followed. In 1965 and 1966, the parks received the funds to build 100-foot wide fuel breaks, cleared of debris and other matter to a height of nine feet around Grant Grove and at the approach to Cedar Grove in Fresno County.³⁶

The Service’s move toward a wider acceptance of prescribed burning gathered momentum. “We needed to know how to reduce the fuel [and] fire under the sequoias,” Schuft remembered, “and how much actual manipulation was needed to burn safely.” According to his contemporaries, Schuft was well known for his aggressive campaign to promote fire. Harry Schimke had developed a controlled prescription for burning, and the park sought a strategy for utilizing it. Starker Leopold played an instrumental role. In October 1967, McLaughlin, recently arrived from Yellowstone, traveled to Berkeley for a meeting Leopold held with the Forest Service at the Forest Service Experiment Station. “We were trying to brainstorm how we would begin this prescribed burn program outlined in the Leopold report,” Kilgore remembered. “There was a lot of skepticism shown, a lot of questions.” Leopold took charge, telling the assembled foresters: “We came to this meeting to get ideas on where and how to go. We are not asking your opinion on whether we should go. We want to know what the best program is.”

³⁵ Resource Management Plan, Yellowstone National Park, 1970, Box W-105, Yellowstone National Park Archives.

³⁶ Peter H. Schuft, “A Prescribed Burning Program for Sequoia and Kings Canyon National Parks,” *Proceedings, Annual Tall Timbers Fire Ecology Conference, June 8-9, 1972*, 380-82.

Leopold's demeanor became bolder. "In fact, he said we are going to prescribe burn," Kilgore remembered. "The meeting turned around a fair bit."³⁷

The results were dramatic. With Leopold's support and Biswell's experience, an attempt at intentionally starting a fire in pursuit of resource management goals seemed viable. Superintendent McLaughlin had been at Sequoia and Kings Canyon for almost a full year and knew the political terrain. He determined that a program involving both natural fires and prescribed burns should go forward. The area of the park chosen for both parts of the program in 1968 was the Middle Fork of the Kings River drainage. Prior to that summer, McLaughlin approved the first prescribed natural fire program (allowing lightning-induced fires to burn under prescribed conditions) in the National Park Service. For that first summer, fires ignited above 8,000-foot elevation were allowed to burn (there were a total of two). In addition, a 1,100-acre unit on Rattlesnake Creek in the Middle Fork drainage was selected for a prescribed burn, the first authorized under the new policy. The location had been carefully chosen to minimize the chances of a fire getting out of control. Surrounded on three sides by rocks, the area was "basically a fir stand," Schuft recalled. "Schimke gave us a prescription to burn within, and we actually burned out the basin in 300-foot wide burns starting at the top and burning down."³⁸

Both phases of the project were deemed a success and the park planned more burning. In 1969, Sequoia and Kings Canyon National Parks designated an area of 129,331 acres, almost 15 percent of the two parks, as "let burn" areas, where fires would be allowed to run their course unless they affected park facilities. Most of these lands were above 8,000 feet in elevation; some were above the timberline. In addition, the parks intentionally burned 6,186 acres. Planners soon raised the elevation at which lightning fires were allowed to burn to 9,000 feet, engaged in prescribed burns in high country meadows, and initiated a 100-acre prescribed burn at the Redwood Mountain Grove of giant sequoias in Kings Canyon National Park that took place between August and October 1969. To initiate each burn, fire specialists picked a one-mile long, 300-foot-wide area atop a ridge and began to burn it in 1,000-foot sections. Crews first trimmed the fir and cedar foliage, cutting down trees that were less than nine feet tall. Then, a two-foot wide fire break was built, dug down to "mineral soil," and fire hoses were located around each entire section. "We waited for each section to burn itself out before we started the [next] one," Schuft recalled. Crews progressed from the top of the ridge to the bottom.³⁹

At the North Fork, Crystal Cave, and Marble Fork areas, the park undertook a larger and less closely monitored project. Beginning on October 29 and continuing until the snows came in mid-December, Kings Canyon crews initiated a 6,140-acre burn that occurred "without intensive preparation," Assistant Superintendent Jerry House noted. Pesticides, including 2,4-T, were sprayed on brush, and existing roads and trails served as

³⁷ Schuft, "A Prescribed Burning Program for Sequoia and Kings Canyon National Parks," 383; Bruce Kilgore interview, February 16, 2004; James Agee interview, June 10, 2004.

³⁸ Schuft, "A Prescribed Burning Program for Sequoia and Kings Canyon National Parks," 383; Larry Bancroft, Thomas Nichols, David Parsons, David Graber, Boyd Evison and Jan Wagtendonk, "Evolution of the Natural Fire Management Program at Sequoia and Kings Canyon National Parks," *Proceedings of the Wilderness Fire Symposium*, Missoula, Montana, November 15-18, 1983, 176; Bruce M. Kilgore and George S. Briggs, "Restoring Fire to High Elevation Forests in California," *Journal of Forestry* (May 1972, 266-271).

³⁹ Schuft, "A Prescribed Burning Program for Sequoia and Kings Canyon National Parks," 380-82.

firebreaks. When the fires came close to crossing park boundaries, bulldozers created new fire breaks that prevented its spread. The burn reduced fuels around some of the park's most important places and also cleared a number of existing fire breaks of combustible material.⁴⁰

House assessed the information gained in the burns, weighing the benefits against the concerns such a program raised. Questions clearly remained. Kings Canyon lacked appropriate prescriptions and sufficient fire weather data. "Much time was wasted trying to burn without results because of a lack of fire weather data," he observed. The park also needed to refine its prescriptions, aiming the type and heat of the prescribed fire directly at the desired result. Even more troublesome, House noted, was the expense. Although he was able to allot \$33,984 on the prescribed burning program from the park's general operating fund, he believed that "to do the job right and get on a scheduled basis, we would need \$100,000 a year for 10 years." Such a sum would give Kings Canyon a ten-person crew and a foreman throughout the year dedicated to the prescribed burn program.⁴¹

Another concern vexed House and other administrators who allowed some fires inside their boundaries to burn. If lightning fires that went loose posed one kind of public relations problem, nothing was more damaging to the idea of controlled burning than an intentionally set fire that exceeded its boundaries. Control remained an enormous issue; the public could barely understand letting wild fire alone, much less starting an intentional fire that eluded control. If such an endeavor went awry, the consequences could be enormous. House recognized that supporting a program of prescribed fire might be almost as expensive as suppression, and possibly damaging not only to the park's facilities but to its reputation as well.

By the early 1970s, the programs at Sequoia and Kings Canyon had begun to show measurable results. Between 1968 and 1971, fifty-three fires had been allowed to burn themselves out under the let burn program before the NPS changed the name; only one such fire, in 1970, had to be extinguished. Most of the fires took place inside designated "let burn" zones; nine outside its boundaries were allowed to burn themselves out. McLaughlin felt confident that this experience showed that "natural fires under conditions pertaining in the southern Sierra burn out after spreading over a relatively small area." He felt certain that the experience at Sequoia and Kings Canyon showed that "resource managers could restore fire to its natural role in parks and wilderness . . . in a way that is acceptable to the public."⁴²

McLaughlin's support for the fire program was a crucial dimension in its continuation. He used the power of his office to support the program even when it might have been politically more viable to back away. In one instance, "one of the fires got away and burned up some stuff. There was a big review down in Sequoia which [Lyle] McDowell came out for," Barbee recounted. "It was a kind of billed as a public hanging,

⁴⁰ Ibid., 384; Acting Superintendent, Sequoia and Kings Canyon to Director, Western Region, April 10, 1970, Sequoia National Park Archives, FR 68-76, Redwood Mountain Man U Box 34, F1; John S. McLaughlin, "Restoring Fire to the Environment in Sequoia and Kings Canyon National Parks," *Proceedings, Annual Tall Timbers Fire Ecology Conference*, June 8-9, 1972, 391-3.

⁴¹ Acting Superintendent, Sequoia and Kings Canyon to Director, Western Region, April 10, 1970, Sequoia National Park Archives, FR 68-76, Redwood Mountain Man U Box 34, F1.

⁴² McLaughlin, "Restoring Fire to the Environment in Sequoia and Kings Canyon National Parks," 393-94.

and I went.” Yosemite Superintendent Larry Hadley told Barbee: “I don’t want any of these goddamn fiascos taking place up here in Yosemite.” Hadley “knew where I was headed, and he didn’t want his own fiasco,” Barbee remembered. “He said, ‘you get down there and see what you can learn from it.’ So, I did.” Barbee was impressed with McLaughlin’s commitment to the burn program and his dexterity in handling criticism of the practice. “McLaughlin defused it immediately,” Barbee observed with admiration. “He stood up and said that this is such an important program that we can’t jeopardize it, and he took full responsibility for what has occurred. That just stopped [the critics] in their tracks.”⁴³

McLaughlin retained concerns about the implementation of fire regimes in national parks. Although he was an advocate of allowing natural fires to burn, he was not certain of the viability of prescribed fire. He recognized the value of the program, but feared that the financial resources upon which implementation depended would be impossible to secure. This, he believed, was a dangerous scenario. New air quality standards that stemmed from the Clean Air Act of 1970 also seemed to McLaughlin to impede the use of fire. Such rules were “being interpreted to imply that the environment can not stand any more smoke of any sort or that all smoke is bad,” he suggested. “Smoke from natural fires has been in our environment since time immemorial, and it may well be an essential part of it.”⁴⁴

By 1971, McLaughlin had become comfortable not only with the park’s new burn policy, but with the terms under which he as a superintendent could implement it. Late in the summer season in 1971, he issued a management directive that underpinned Kings Canyon’s strategy for addressing high-elevation natural fire. Using the language of the Green Book, he linked his park’s resource management goals with the natural fire directive, establishing a rationale for the park’s program. The plan took shape around the goal of “perpetuating animal and plant habitats in the management unit,” leading to the guideline of letting fires burn, with careful monitoring when they were above 9,000 feet in elevation. McLaughlin reserved the right of his wildfire committee, the park fire chief or acting fire chief to order suppression of a fire that threatened to spread beyond designated boundaries. He carefully delineated the areas covered in the program, producing the clearest articulation to that time of the superintendent’s power in implementing the use of fire.⁴⁵

McLaughlin embraced fire as a tool at his parks, implementing programs that helped his resource managers and met with public approval. Despite concerns about the efficacy of prescribed burning, which still seemed diffuse and without concrete objectives, the program flourished. Where it was implemented, it achieved a primary goal. It reduced the dangerously high fuel loads that led to intense fires that damaged sequoias. Other parks experimented with fire programs, often looking to Sequoia and Kings Canyon for examples. They continued to grapple with the consequences. They were reassured by researchers who worked closely with the parks. Richard Hartesveldt was the leader of the San Jose State College research at Sequoia and Kings Canyon

⁴³ Robert Barbee interview, part I, November 12, 2004.

⁴⁴ McLaughlin, “Restoring Fire to the Environment in Sequoia and Kings Canyon National Parks,” 393-94., 394; Rothman, *Saving the Planet*, 125-30.

⁴⁵ Superintendent to the Park Staff, Memorandum, September 7, 1971, Sequoia National Park, Fire Records, Box 191, F1.

National Parks. He worked with park personnel to devise a better strategy to protect the sequoias. Hartesveldt suggested burning around the base of the trees prior to a prescribed burn, removing the fuel sources that caused so much damage to the big trees. Harold Biswell and his proteges – Jan van Wagtendonk, James Agee, and Bruce Kilgore– also helped persuade park superintendents of the efficacy of their strategies. The scientific basis for decision-making became a strategy to justify the fire programs. As the scientists played a larger role with each passing season and every positive result, the parks’ shift toward the use of fire began to solidify.⁴⁶

The growing emphasis on outside research brought Yosemite National Park to the forefront. Despite its proximity to the research at Sequoia and Kings Canyon and its historic position as an important fire park, Yosemite had been a backwater of fire research. “When the Park Service has had controversy” associated with fire, Jan van Wagtendonk observed, “Yosemite has usually escaped.” The transformation from backwater to forefront happened quickly. Yosemite “had some really hot shot natural resource management people,” Agee remembered. By the mid 1960s, Yosemite’s leadership showed interest in using fire as a tool. In January 1966, Superintendent John C. Preston invited Harold Biswell to speak on controlled burning, bringing the man still widely seen as a heretic in to describe his work to the park’s staff. The charismatic Biswell could command an audience and his reputation preceded him. Within a few years, Biswell had become a fixture at Yosemite, and his students conducted a variety of research projects there. By the early 1970s, he began teaching an extension course on forest fire ecology at the park. His presence encouraged further experimentation. In time, Agee believed, the Yosemite program “became on par with that of Sequoia.”⁴⁷

As a result of Biswell’s work and his overarching presence, controlled burning in Yosemite proceeded in a systematic and organized fashion. The scientific basis for such activity was clear, and despite strong resistance from the suppression advocates inside the park, experiments in controlled burning proliferated. In 1968, Robert Barbee returned to Yosemite after graduate training at the “ranger factory” at Colorado State University to serve as “the resource management guy there,” he remembered. “I was brand new, with an entrenched cadre of people who were parks forester and the whole traditional scene.” Many were not receptive to Barbee’s program. “They did not embrace me with open arms,” he smiled from a distance of thirty years. “I didn’t even have an office at first. Bryan Harry, the chief naturalist, let me have a little desk in the library over in the museum. He was the most sympathetic guy of all for what I was trying to do.” Barbee was assigned to write Yosemite’s first natural resource management plan. “The chief ranger I worked for said: ‘your job is to develop this plan, but don’t think you are going to do anything,’” he recalled. “I am not wired that way. And so anyway I sat there for six months, did a lot of research and started to write the plan.”⁴⁸

Writing a report and implementing it were very different kinds of objectives, and Barbee had to negotiate the distance between them. “I soon realized what we had to do.

⁴⁶ John S. McLaughlin to Richard Hartesveldt, February 10, 1970, Sequoia National Park Archives, FR 69-72, Man U, Box 11, F 92; Bancroft, Nichols, Parsons, Graber, Evison and van Wagtendonk, “Evolution of the Natural Fire Management Program ay Sequoia and Kings Canyon National Parks,” 176-77.

⁴⁷ James Agee interview, June 10, 2004; Carle, *Burning Questions*, 124; Biswell, *Prescribed Burning*, 112.

⁴⁸ Robert Barbee interview, Part I, November 12, 2004.

There was not a technical problem,” he recalled. “The technical part was easy. I [had] to be an advocate, but I [had] to do it carefully so I [did not] get identified as some sort of a nut.” He faced considerable resistance and moved cautiously. “I was aware that any new administrator or new breakthrough, [any] new program manager can become a casualty quickly,” he mused. “So I had to kind of employ whatever charisma I had to deal with it. That was the problem.” He soon was assigned an office in the headquarters building, “in the attic,” he remembered with a smile. “Then I got an office downstairs with a window, and then they reorganized the park and I ended up with what used to be the foresters and the big guys on my staff. They were Indians and they were big on this whole notion of prescribed burning.” Barbee’s program gained momentum.⁴⁹

He prepared to reintroduce surface fire at a variety of locations in Yosemite, including the ponderosa pine-bear clover fuels near Wawona Hotel, the eleven-mile road region in the park’s northwest quadrant, Yosemite Valley, and the Foresta Village. At the Mariposa Grove and the Tuolumne Grove of giant sequoias and sugar pines, “there was no way you could set a fire,” Barbee recalled. “The white fir was over your head, and you would have a holocaust there if you did not watch out. So what we did in the sequoia groves is try and simulate the fire by cutting, burning, piling the white fir and incense-cedar. The Sequoia groves [were] just too valuable a resource and we could not take a chance. The vegetative shift had taken place so long ago that there were no sequoias, no seedlings or anything, it was just solid white fir.”⁵⁰

Despite such a bold plan, without adequate resources, the chances of its comprehensive implementation were slim. The introduction of prescribed fire began in fits and starts. The first prescribed burns took place in fall 1969 at Foresta Village, and by summer 1970, a rudimentary prescribed burning program was in place. Biswell, Harry Schimke, and Barbee all were instrumental in its design and implementation. The BIA’s Harold Weaver, another of the progenitors of prescribed burning, visited Yosemite to assess the work. Biswell and James Agee, working on his Ph.D. with Biswell, joined him on a trip to Mariposa Grove. Weaver was impressed with the park’s accomplishments. “Improvement by clearing, piling, and burning of the dense white fir understory and the accumulated flammable debris of the forest floor is an excellent project,” he informed Yosemite Superintendent Lawrence Hadley.⁵¹

Weaver continued his tour, visiting prescribed burns at the El Capitan Picnic Area, El Capitan Meadow, the El Capitan Vista area, Wawona, Foresta, and at the Tuolumne Grove of Sequoia. Weaver saw tremendous value in the project, for in each locale it reduced the understory and the attendant fire hazard, brought back long suppressed flowering plants, ferns, and grass-like plants, and eliminated accumulated debris and weak trees. “I like the work at Yosemite very much,” he concluded. “It has been skillfully accomplished by men who understand fire ecology and fire behavior and who know how to use fire.”⁵² No higher compliment could come from a leader of the discipline.

⁴⁹ Ibid.

⁵⁰ “U.C. Foresters Aid Fire Ecology Program at Yosemite National Park,” *California Agriculture* 25 (February 1971), 3; Robert Barbee interview, Part I, November 12, 2004.

⁵¹ Harold Weaver to Lawrence C. Hadley, Superintendent, Yosemite, August 4, 1970, Yosemite National Park Archives, Central Files, Y 14, Forest Fire Control, 1970.

⁵² Ibid.

Supported by such praise, the move to introduce fire became more aggressive. A new environmental restoration plan authored by Barbee and approved in 1970 brought Biswell's ideas to Yosemite in a formal way. Prior to human arrival, the plan stated, "surface fires were one of the most important natural agents controlling the distribution of trees and meadow vegetation." Fire had been critical; many areas of Yosemite revealed natural fires about every two years over an extended period. Suppression had significantly altered the landscape and "active management," the combination of introduced fire, natural fire, and other efforts to reduce fuel load, had become an essential step in achieving resource management goals. "Solving Yosemite's ecological problems must certainly include the use of planned fire as a management technique," Barbee believed. He selected five regions in the park for initial restoration, regarding the effort as the "initial step in re-establishing park ecosystems that have been altered by fire exclusion."⁵³

The idea of an environmental restoration program melded a number of important trends in federal conservation. Barbee recognized the growing emphasis on meeting the requirements of federal statute stemming from the passage of the National Environmental Policy Act in 1970. That Nixon-era law became the basis for the entire regime of federal action on public lands, a process that the National Park Service came to call "compliance." A natural resource specialist, he embraced the science that had become the intellectual basis of his profession, another of the many results of the Leopold Report and the shift in NPS direction it heralded. At the same time, Barbee built on the growing interest in the work of Biswell and his peers, bringing fire science inside the NPS loop in important ways. Barbee "kept pushing and Bob kept burning," Agee remembered, keeping prescribed burning in the forefront.⁵⁴ The result was a program that almost perfectly reflected the national mood about the environment, the new emphasis on science in the National Park Service, and the growing trend in the federal government toward statutory regulation of environmental issues.

The burning already undertaken at Yosemite National Park was such a success that a significant percentage of its staff embraced the new ethos. "It is our contention that the time has come when Yosemite should break the ground for some research of our own in the ecological manipulation of resources of the park," Yosemite Fire Control Officer Jim Olson announced in September 1970. He proposed a fifty-acre burn on the Eleven Mile area of the Wawona District, which he wanted to undertake before the fall rains arrived. Olson needed the heat that dryness would generate to accomplish his management goals. White firs were the target; only intense heat could kill the species. Olson planned control lines to surround the fire, and located the burn far from roads to limit any potential consequences. "Strict adherence to prescription levels and weather forecasts will preclude uncontrolled fire out of the area," he predicted. "Research along these lines will enable us to answer some of the questions unanswered for Yosemite fuels and conditions."⁵⁵

⁵³ Robert Barbee, in collaboration with Harold Biswell, "Environmental Restoration Program for Yosemite National Park, 1970," Yosemite National Park Archives, NPS, Protection Division, Fire, Prescribed Fire, 4 14 1969-1985, 1-6.

⁵⁴ James Agee interview, June 10, 2004; Rosenbaum, *The Politics of Environmental Concern*, 117-23.

⁵⁵ Fire Control Officer Jim Olson to Wawona District Ranger, September 22, 1970, Yosemite National Park Archives, Y14.

In plans such as the Tuolumne Meadows Experimental Burn in 1970, an addendum to the park's environmental restoration program of the same year, Yosemite proposed an orderly set of small controlled burns within the meadow. Barbee designated ten five-acre plots, with a scientific rationale for each. Lodgepole pine had been encroaching on Yosemite's high meadows for most of the century and the park sought remedies to the problem. Barbee proposed a comprehensive prescription for conducting the burns, with close observation of weather and a spot forecast from the Fresno weather station to validate the prescription and sustain it throughout the burn.⁵⁶

After the implementation of such plans, the idea of using prescribed fire gained momentum. Fire management fit nicely into the value system of early 1970s America, an era in which many came to see the earth as an organism rather than a canvas for human endeavor. On some levels, this new approach suggested arrogance: humans believed that they could control fire, a conceit long harbored. Science contributed to this impression, for Americans remained firm in their belief that technological solutions existed for all classes of problems. The National Park Service drank from this heady brew, but with a little more caution than those farther from the front lines. As McLaughlin at Sequoia and Barbee at Yosemite noted, the advantages of fire were many as long as adequate resources supported the endeavors. The Sierra Nevada parks benefited from the proximity of the University of California, Berkeley and a growing variety of research that emanated from there. When Yosemite developed a new master plan in 1971, Biswell presented a statement in favor of the park's use of fire. Prescribed fire was "the best and most desirable way to correct the undesirable situations now existing," he asserted. Biswell regarded the use of fire as the way to prevent catastrophic wildfire, an idea that had currency mostly among the scientific community.⁵⁷

Opponents of prescribed burns remained, some prominent in the California natural resource bureaucracy. Shandon Valley rancher Ian McMillan, a member of the California State Parks Commission, adamantly opposed the use of fire. He regarded the NPS's program at Yosemite as a vanguard for a similar program in the state park system, and he opposed it with everything at his disposal. McMillan peppered California's legislative representatives with letters detailing his objections. He informed U.S. Senator Alan Cranston, D-Ca., that the burned park landscapes appeared to him as "an artificial manmade spectacle, entirely unnatural, incongruous, extremely unpleasant to view, and a flagrant violation of the concept of nature preservation on which the park was founded." He told Yosemite Superintendent Lynn Thompson that he regarded burning as "artificial landscaping" and suggested that the use of fire showed an emphasis on "game management and habitat manipulation," what he called an "alien philosophy that overturned the 'basic park ethic.'"⁵⁸ Hyperbolic and overzealous, McMillan could be easily dismissed, but he represented a powerful sentiment against prescribed burning.

When Horace Albright, eighty years old in 1970, inserted himself into the conflict, burning advocates no longer could pretend that opponents of the use of fire were inconsequential. When he heard of plans to allow lightning fires to burn in Yellowstone

⁵⁶ Robert D. Barbee, "Experimental Use of Prescribed Fire to Control Lodgepole Pine Encroachment," October 9, 1970, Yosemite National Park, Y16.

⁵⁷ Carle, *Burning Questions*, 147-48; Jan van Wagendonk interview, June 13, 2002.

⁵⁸ Horace M. Albright to George B. Hartzog, Jr., July 12, 1971, DPR, quoted in Carle, *Burning Questions*, 151.

National Park in 1972, Albright went straight to NPS Director Hartzog. An “old -school greenery is scenery” type, as Jan van Wagtenonk labeled him, Albright insisted that fire had no place in an ecosystem. “George, I say this with the utmost devotion to you,” Albright finished. “If you do not stop this fire policy, at least for 1972, I’ll have to enter the defense of Yellowstone.” Two years later, Albright was present at the Star King Fire at Yosemite. Angered by the smoke, he grabbed van Wagtenonk by his lapels and said: “I understand you’re responsible for all this smoke.” Two years into his career with the NPS, van Wagtenonk was unwilling to engage the Service’s avuncular grandfather. “I said, ‘not me!’ I pointed to the [Yosemite] Resource Manager Dick Riegelhuth,” van Wagtenonk recalled with a smile. “Dick handled it just fine.”⁵⁹

Albright’s vehement opposition illustrated how much and how little had changed concerning prescribed fires. By the middle of the 1970s, the National Park Service engaged in much more than an experiment with natural and prescribed fire. Most of the major national parks – including Yellowstone, Yosemite, Grand Teton – had established programs. The NPS approved Yellowstone’s first fire management plan in spring 1972. It included only two prescribed natural fire zones. A 1975 revision reversed the vision, accentuating the importance of fire; it designated the entire park as a prescribed natural fire zone except for the developed areas. The onus had shifted; burning took precedence except in developed areas.⁶⁰ The use of fire became an integral part of the NPS approach to preventing fire. In his day, Horace Albright could have terminated a natural or controlled burn policy with a wave of his hand. But even the reverence in which he was held and his still significant political powers could not affect fire’s status in the mid-1970s.

Major conservation figures such as David Brower and Edgar Wayburn of the Sierra Club did not like the results of fire any better than did Albright. Jan van Wagtenonk took Brower into the Mariposa Grove at Yosemite to show him new seedlings that sprouted in the wake of a prescribed burn. “I understand, philosophically, what you are saying to me, but emotionally, I just can’t handle the black trees,” Brower told the scientist. Brower was perhaps the leading figure in American conservation – the individual who put wilderness into the national lexicon, architect of the demise of the Echo Park Dam and the most outspoken proponent of nature protection of his day. Brower’s sentiments were telling. For all the good fire did for ecological systems, its damage to aesthetic qualities ran hard against the vision of pristine nature that bolstered the American sense of self in the early 1970s.⁶¹

Nor was the sentiment confined to those outside the National Park Service. The generations raised on fire as an enemy still permeated the NPS, and they grappled with the implication of the new policy. “Old habits die hard,” observed Director Hartzog, “and many a fine park ranger and superintendent did not jump with joy to embrace the new policy.”⁶² Yet, momentum favored change. Hartzog’s support, Lyle McDowell’s

⁵⁹ Jan van Wagtenonk interview, June 13, 2002; Carle, *Burning Questions*, 150-51; Hartzog, *Battling for the National Parks*, 105.

⁶⁰ *Yellowstone Fire Management Plan*, 1972; Resource Management Plan, 1975, Y-218; Robert E. Sellers and Don G. DeSpain, “Fire Management in Yellowstone National Park,” *Proceedings, Annual Tall Timbers Fire Ecology Conference*, V 14 (1976), 102-08.

⁶¹ Jan van Wagtenonk interview, June 13, 2002; David R. Brower, *For Earth’s Sake: The Life and Times of David Brower* (Salt Lake City: Gibbs Smith, 1990), 328-34.

⁶² Hartzog, *Battling for the National Parks*, 105.

prominent role in developing a management structure for implementing the use of fire, and the acceptance of the idea of ecology meant that the NPS could craft a structure within in which the use of fire would become a normal part of Service practice.

By the mid-1970s, the National Park Service had reached an initial point of maturity in its fire management program. The use of fire as a resource tool had begun with the Leopold Report, migrated to the Green Book, and then continued into application through people in the Washington office and the regional offices in the field. It centered in Yosemite, which had become central to the NPS's vision of addressing fire, and had spread to more than two dozen parks. When superintendents wanted to consider initiating controlled burning, they often turned to Yosemite. Kilgore, by then associate regional director for resource management and planning in the Western Region, had become one of the Service's leading thinkers on the subject, and he recognized the need for a more comprehensive vision. Fire and its use – and increasingly its suppression – remained episodic. Kilgore had come to believe in a three-part total fire program. “Allowing fires was part of it, suppression was part of it, and prescribed burns [were] a part of it,” he stated – a policy that respected local authority by basing decisions on each park's fire planning documents. In an article published in *Transactions of North American Wildlife and Natural Resources Conferences*, Kilgore called for a change in thinking about fire that he described as a transition from fire control to fire management that would let the National Park Service manage its units on an ecological basis. He envisioned the resource management and fire management units in the regional offices supporting their counterparts in the parks, by encouraging implementation of plans and securing the funding to carry out burn programs.⁶³

The early years of the program that recognized fire as an ecological asset also had begun a transformation of National Park Service procedures. The acreage initially burned was not enormous, but given the sincerity and severity of opposition to the very idea of burning, it spoke volumes about the magnitude of change. Through 1974, ten parks had allowed only 27,000 acres of timber to burn as a result of natural fire and five parks had burned 37,000 acres under prescribed conditions. Of that, 33,000 acres had been burned at Everglades National Park, where fire had been a staple of management for almost two decades and where the most comprehensive program in the national park system took place. Yet the philosophical underpinning belied the limited application. Kilgore loudly asserted that the NPS could not “gamble with a force as potent as fire – either we should have it under full control at all time or we shouldn't use it at all.” But the use of fire was imperative: allowing fuel loads to accumulate simply passed a more difficult problem to a future manager.⁶⁴

As late as 1974, the NPS fire program had yet to encounter significant public opposition. Because the program remained small – even though considerable acreage was included in areas where fires were allowed to run their course – there had been few circumstances in which fire impacted visitors or nearby communities. Until such an event

⁶³ Bruce Kilgore, “From Fire Control to Fire Management: An Ecological Basis for Policies,” *Transactions North American Wildlife and Natural Resources Conferences* 41 (1976), 473-77; Bruce Kilgore interview, February 16, 2004; Superintendent, Crater Lake National Park to Superintendent, Yosemite National Park, April 15, 1976, YNP 57.

⁶⁴ Bruce Kilgore interview, February 16, 2004; Bruce Kilgore, “Fire Management in the National Parks: An Overview,” in E. V. Komarek, ed., *Tall Timbers Fire Ecology Conference Proceedings* (Tallahassee, FL: Tall Timbers Research Station, 1976), 45-57.

occurred, the NPS was operating in a Petri dish – conducting an experiment that tested neither the Service’s commitment to the program nor its ability to address pressure from the public. The summer of 1974 changed that equation. A significant public relations backlash against NPS policy and procedure resulted from the management of a small fire at Grand Teton National Park. The Waterfalls Canyon Fire was a slow-burning and generally visible fire that burned for more than three months before rain and snow extinguished it. It provided a pivotal test of NPS commitment and a barometer of the issues that could have easily derailed the use of fire in the national park system.

Before 1974, Grand Teton National Park had joined the small group of parks that aggressively implemented a natural and prescribed burning regime. Almost from the moment of the publication of the 1968 Green Book, park officials planned for the use of fire. Implementation took longer than park leadership anticipated. The weather had been ideal for burning in 1970 and 1971, but Grand Teton managers demurred because of a lack of research data. By 1972, they decided enough research had been completed to begin and NPS Biologist Lloyd Loope and George Gruell of the Forest Service began planning the burn. Press releases in the *Jackson Hole News* in June and August 1972 explained the program and its goals. The park prepared a fire-vegetation management plan in 1972, specifying 125,000 acres on which lightning fires would be allowed to burn. When the Midwest Regional Office evaluated the plan, officials rejected it as too dangerous, ordering the park to redesign the parameters of its program.⁶⁵

Even before Grand Teton and NPS staff redesigned the plan, the first prescribed burns in the park took place under previously approved conditions. The 1973 program called for two prescribed burns in Grand Teton National Park. The first, a scheduled twenty-acre burn on Blacktail Butte was delayed for the year when wet conditions slowed the drying of the understory. Crews ignited the second planned fire – a 100-acre burn on Uhl Hill – on August 28. The conditions were difficult, for the fine fuel moisture (FFM), temperature, relative humidity (RH), and wind speed were not within the optimum range of the burning prescription. To compensate for the less than optimal conditions, the park instituted a series of additional protective measures. A more than one mile-long fire line had been cleared previously, crews removed surface vegetation, and the park widened another existing fire line and extended it. A total of fifty-six people worked the fire line, including a crew with a D-7 Caterpillar earthmover standing by in case of a need for rapid response. Smoke dispersal conditions approached excellent. “The forecast was favorable, manpower present, and burning commenced at 1300” hours, the official report of burn recorded.⁶⁶

The weather conditions did not cooperate with the burn program. Smoke from the fire drifted east and then southeast toward the Mt. Leidy Highlands, large sedimentary mountains east of Jackson and north of the Gros Ventre River. Only a small amount of smoke settled in the Buffalo Valley, but any amount there had been one of the fears of planners. They expected the smoke to inspire local resentment. The fire consumed nearly thirty acres of sagebrush that surrounded a stand of aspen, but it lost its impetus in the green and moist aspen understory. Only a few small areas burned at all, and most did not

⁶⁵ N.A., “Fire Management in Grand Teton National Park;” no title, *Jackson Hole News*, June 22, 1972; *Jackson Hole News*, August 10, 1972.

⁶⁶ “1973 Prescribed Burning Statement,” Fire Records, Box 1, (located in Law Enforcement Evidence Room), Grand Teton National Park.

burn thoroughly. Staff members patrolled the fire area for three days, engaging in only a little additional work. On September 1, rain and snow extinguished the fires.⁶⁷

Despite some negative results, the Uhl Hill fire gave the park confidence in the prescribed burning program. In the most basic of terms, Grand Teton had started a fire, monitored it, and achieved some resource management goals without incurring the ire of the community. While less acreage than intended was consumed, the fact that the burn came off without significant problems was a major achievement for supporters of the use of fire. It showed that if undertaken carefully, intentional burning did not have to affect community-park relations. Nor did it have a negative effect on natural resources. Even if the Uhl Hill burn did not accomplish everything its planners expected, Grand Teton saw it as an important starting point for continuing the possibility of implementing a regime that used fire to shape the natural environment.

Devising an acceptable plan to govern the overall burning process proved more complicated. In July 1974, Grand Teton National Park circulated a revised draft environmental assessment of its proposed fire-vegetation management plan. When the park held hearings on the proposal, it received an array of comments. The majority of the negative comments focused on the oldest of national parks issues: as seasonal research biologist Dale Taylor expressed it, the question was “when are things *natural* and when are we *gardening*?” A range of figures, including the prominent wilderness advocate Adolph Murie, believed that the use of fire in the national parks was overzealous tampering. “We should be guardians not gardeners,” Murie had written in a critique of the Leopold Report in 1963, a sentiment echoed by Howard Zahniser of the Wilderness Society, and in 1974, Murie remained unconvinced of the efficacy of the report and the controlled burning it recommended. University of Wyoming Zoology Professor Oscar Paris supported natural fire but urged that “any program of prescribed burns in the park be dropped forthwith . . . [it would] serve only as blemishes on the land.” Louise Mardy observed that the many spot fires constituted more than the “minimum of management” that was consistent with park policy. The less numerous positive comments came from those with some background in natural resource or fire management. U.S. Forest Service retiree Richard E. Baldwin believed that the idea of a burning program was a good one, but that the NPS needed more fire suppression and fire behavior expertise on its fire management team. Such specialized commentary amounted to refinement of NPS practices rather than opposition.⁶⁸

Nine days later, on July 17, 1974, lightning kindled the Waterfalls Canyon Fire. That summer around Grand Teton National Park had been extraordinarily dry, with successive months of below-normal precipitation. When the fire started in the area of a five-acre burn from the previous year, the park staff’s initial reaction was to let it go and monitor it. With other natural fires burning in both Grand Teton and Yellowstone national parks, the Waterfalls Canyon fire did not seem exceptional. It spread “slowly,

⁶⁷ Ibid.

⁶⁸ Gary Everhardt, “To Whom it May Concern,” June 28, 1974; “Testimony Presented at the Public Hearing on the Draft Environmental Impact Assessment of Grand Teton National Park’s Fire-Vegetation Management Plan held in Jackson, Wyoming on July 8, 1974;” Richard E. Baldwin to Gary Everhardt, July 10, 1974; Dale Taylor to Richard E. Baldwin, July 17, 1974; Louise G. Murie to Gary Everhardt, July 18, 1974; Philip M. Hocker to Gary Everhardt, July 19, 1974; Adolph Murie to Gary Everhardt, July 18, 1974, Fire Records, Box 1, (located in Law Enforcement Evidence Room), Grand Teton National Park.

sometimes invisibly, sometimes with billows of smoke. . . . At no time was the fire's behavior unpredictable or was the fire uncontrollable," chroniclers noted. In an attempt to soften the public's response to seeing the fire be allowed to burn, park interpreters explained the Service's natural fire policy to visitors. The fire continued to smolder, growing to only 200 acres in the first six weeks. On September 10, almost two months after it began, the fire reached 500 acres in size and was moving upslope. After that, it grew rapidly. On September 18, it reached 1,500 acres. The next day, the fire topped 1,900 acres. Its smoke filled the town of Jackson, Wyoming, prompting negative responses from the community.⁶⁹

Jackson had been uneasy before mid-September. The blaze was two months old and following it had become local sport. But no one in town could recall a fire that lasted as long. Whatever support existed for the policy of allowing natural fire to burn diminished daily. The "smoky pall," as one local newspaper called it crystallized negative sentiment. "Has Smokey the Bear Become Smokey the Firebug?" a September 19 paid advertisement from Concerned Citizens of Teton County in the *Jackson Hole Guide* screamed at the townspeople.⁷⁰ The town did not object to natural fire per se; what residents said they disliked was what they perceived as a cavalier attitude on the part of the National Park Service. From the town's perspective, Grand Teton seemed content to let the fire burn itself out no matter how it inconvenienced locals. An eventuality that many in the NPS recognized occurred: Two very different dimensions of the National Park Service's obligations – resource management and community relations – collided head-on.

The controversy bubbled over, and soon attained national dimensions. The Rocky Mountain regional NPS office issued a press release that explained fire policy while dexterously avoiding the words "let burn." Service officials had decided the term connoted a lack of monitoring when the hallmark of the NPS program was close attention as any fire burned. The September 20 press release was widely circulated in an effort to explain the NPS reaction to fire to the public. In early October, the *Denver Post* ran a major story on the Waterfalls Canyon fire, and its *Empire Edition*, which covered the northern Rockies, featured a photograph of the fire on its cover. CBS and NBC showed filmed reports later in October, and *Time* magazine also covered the story.⁷¹

The National Park Service recognized that the traveling public had witnessed the fire in large numbers. By one count, at least 100,000 visitors saw at least smoke from the fire. Despite explanatory efforts, most people could not fathom letting a fire burn, and many expressed concern about the aesthetic impact of the fire. Others questioned its impact on wildlife, air and water quality, and vegetation. The emotions that accompanied their observations were powerful; most people truly could not comprehend allowing the fire to burn.

Waterfalls Canyon illustrated a problem with which the National Park Service had yet to grapple. While the NPS burn program had genuine empirical grounding, the emotional response of the public had nothing to do with the efficacy of the science that

⁶⁹ "Narrative – Waterfalls Canyon Fire," 76; Lloyd Loope, "Report on Uh Hill Burn of 8/28/73, Fire Records, Box 1, (located in Law Enforcement Evidence Room), Grand Teton National Park.

⁷⁰ "Has Smokey the Bear Become Smokey the Firebug?" *Jackson Hole Guide*, September 19, 1974.

⁷¹ "The Anatomy of a Public Issue: The Waterfalls Canyon Fire, Grand Teton NP," (rough draft), Fire Records, Box 1, (located in Law Enforcement Evidence Room), Grand Teton National Park.

underpinned the decision to let burn. The American public feared fire; it had been raised on Smokey Bear and Bambi, and typically thought of national parks as beautiful vacation lands. Most members of the public simply could not comprehend the need to allow fire. In an age of quality of life environmentalism, when Americans saw in their affection for the environment a measure of the grace and power of their society, they could not understand how their aesthetic consciousness could be intentionally intruded upon with the tacit acceptance of the federal agency they trusted to guard the nation's natural treasures. In a time marked by a public energized with questions pertaining to the environment, the National Park Service found its friends to be its greatest critics when it came to using fire to shape the parks' physical environment.

Waterfalls Canyon had another important impact. It taught the NPS the value of communicating its science policy to the public. As did most scientists, those working for the National Park Service tended to rely on their specialized knowledge and expertise and to dismiss those who disagreed with them. Often, large segments of the general public either did not understand this scientific message or did not trust the message they received. This circumstance had more to do with the decline of the position of science in society than it did with anything the National Park Service said or did, but the result was the same. The public felt uncomfortable with the decision to use fire as a tool. Little anyone in the NPS said could change that reality.

Ultimately, the idea of controlled burning received a powerful boost from the Waterfalls Canyon Fire. An article on the fire in *Time* magazine perfectly reflected the new NPS fire policy. Smokey Bear was "no ecologist," the article asserted. "He is not aware that natural – as opposed to man-made – fires are good for forests." Even as it acknowledged opposition to the policy, in a careful synopsis of the work of Kilgore and the other ecologists in the Service, the magazine embraced the use of fire. "It is ridiculous that we have been fighting natural fires for 100 years," observed Yosemite Resource Management chief Dick Reigelhuth in the same article.⁷² The coverage refuted the local critique of the fire, a major triumph for advocates of the use of fire in the National Park Service.

In the aftermath of Waterfalls Canyon, the NPS built on this triumph with an extensive campaign to educate the public about its use of fire. "We've got a major problem in explaining our position to the public," Bruce Kilgore told *Time*, but buoyed by the magazine's positive coverage, the NPS formulated a public education campaign. Kilgore identified the single most complex problem – convincing people that fire could be a valuable tool for protecting, not destroying their national parks. No one thought changing such attitudes would be easy. If no less an environmentalist than David Brower could not come to grips with the changes, NPS personnel believed, it was difficult to expect people less versed in the value of ecology to understand. The story of Bambi and the icon of Smokey Bear did not help; both symbols showed fire as a threat to all that was good, albeit in Smokey's case, the emphasis was on the careless manner of humans and the fires they caused. The NPS learned that bringing science to the public was a challenging and difficult task.⁷³

The National Park Service continued its campaign. Press releases, public statements, educational and interpretive programs in the national parks, and other forms

⁷² "Let 'Em Burn," *Time* 104 18 (October 28, 1974), 57.

⁷³ *Ibid*, 57.

of communication made up the effort. In December 1974, the NPS took an important step in bringing this issue in front of the public. A three-page press release – more a newspaper article than a conventional public relations missive – spearheaded the campaign. “National Park Service Studies Show How Forest Fires May Help Preserve the Parks,” the headline announced with certainty. The release attempted to dispel what it called the dominant “fires-are-bad” construct. Recounting the history of natural and prescribed burning from Everglades through Sequoia and Kings Canyon and Yosemite, the NPS document highlighted the ways that fire served as a positive force and as an ecological balance system for land.

Kilgore’s three-part fire program had become policy, and had been put into effect in twelve national park areas – Everglades, Sequoia and Kings Canyon, Yosemite, Grand Teton, Yellowstone, Rocky Mountain, Wind Cave, Carlsbad Caverns, Guadalupe Mountains, North Cascades, and Saguaro. With the exception of Everglades, these parks were in the desert Southwest or the mountains of the West. Guadalupe Mountains and North Cascades were both new additions to the park system; conceived as smaller latter-day versions of nineteenth-century national parks and lacking the long history of firefighting so common in the park system, they were easy candidates for implementation of the new NPS strategy. Carlsbad Caverns, Wind Cave, and Saguaro shared a different set of attributes: all had plenty of easily combustible resources and significant histories of suppression. They too offered the Service a good place to experiment with its new policy. Additions to the program in the near future included Glacier, Grand Canyon, Isle Royale, Redwood, Lava Beds, and Point Reyes. The Service designated more than 3 million acres where natural fires were allowed to burn as long as they did not threaten human life or developed areas.⁷⁴

At its core, the decision to burn remained driven by the management objectives of individual parks, as superintendents chose whether to participate. The factors that influenced them varied. An aggressive prescribed fire policy only made sense at certain types of parks, accounting for the preponderance of western parks where the influence of fire ecology was at its greatest. At most historical parks and most eastern parks, fire did not present as severe a threat as at large natural parks with their long histories of suppression. In a system that left participation to local management, many parks opted not to be involved. Other superintendents did not embrace the use of fire, instead deciding to continue existing practices.

Despite the fact that the burn program was more than six years old in 1974, the press release was the first example of a full-fledged announcement of the program as well as a push for its acceptance by the public. The National Park Service was committed to the new program, and it expressed its commitment in public in a more concerted and consistent manner. Press releases and other communications sought to carry the message forward. For the first time, the fire management program had the public and direct support of the National Park Service director. Gary Everhardt, who ascended to the NPS’s highest post upon the unceremonious departure of Ronald Walker in early 1975, had been superintendent of Grand Teton, the scene of the Waterfalls Canyon fire the previous summer. Everhardt had stood by the burn program despite its negative publicity, and he carried that commitment with him to the top NPS job. In a March 13, 1975

⁷⁴ National Park Service, “National Park Service Studies Show Forest Fires May Help Preserve Parks,” Sequoia National Park Archive, Box 192 (Let Burn 1974).

memorandum, issued less than a month after he took office, Everhardt informed the Service of his “personal interest and involvement in the fire management program.” He offered a schedule for parks preparing to introduce fire shaped by recommendations that Biswell, Kilgore, and others had long suggested. When challenged by congressional representatives on the burn policy, Everhardt stood his ground on fire, a stance that gave fire use advocates heart. Other directors, including the politically adroit George Hartzog, had given tacit support to fire management, leaving it to the local level rather than setting a direction to follow. In this, as in many other dimensions of National Park Service management, Walker, a political appointee with almost no prior park experience, had little background. Everhardt’s public support spoke volumes about the importance of the burn program and the backing it now enjoyed from the highest levels of the NPS.⁷⁵

The National Park Service had been struggling for models from which to develop a Service-wide structure for fire management. In this process, Yosemite’s transformation from backwater fire park to fire policy template continued. With the hiring of Jan van Wagendonk in 1972, Yosemite acquired a highly trained young scholar who quickly became a premier fire ecologist. In concert with Robert Barbee, van Wagendonk helped make Yosemite a model of fire management. Sequoia and Kings Canyon retained an important position as a leader in the development of new ideas and practices. Yosemite developed one of the first and most successful structures to manage fire, most clearly articulated in a 1975 “Role and Function” statement. The document described responsibilities, assigned authority, and divided tasks and responsibilities. Even more sophisticated, this role and function statement made distinctions between prescribed burning and natural, conditional, and loose-herding fire. This division was evident in fire scholarship, but had not been applied even episodically in national parks until this point.⁷⁶

Other parks contributed to the development of a larger NPS model of fire management. At Glacier National Park, Fire Control Officer William Colony took advice from the Rocky Mountain Regional Office in designing a template for a fire management plan. In 1975, Yellowstone completed an environmental assessment, a preliminary step in expanding the natural fire program to nearly the entire park. A new resource management plan, with a comprehensive section on fire management, followed in March 1975. This draft represented the fullest development of a rationale and strategy for Yellowstone’s use of fire to that point. Throughout the National Park Service, the momentum for Service-wide organization of fire management accelerated.⁷⁷

⁷⁵ Memorandum, Director to All Regional Directors and Director, National Capital Parks, March 13, 1975; Director to U.S. Harold T. Johnson, March 13, 1975; Regional Director, Western Region to Superintendents, Western Region, State Director, Hawaii, Chief, Arizona Archaeological Center, Directorate, Western Regional Office, Yosemite National Park Archives, Y 14 Forest Fire Control, 1914-1975; Foresta, *America’s National Parks and Their Keepers*, 39-55.

⁷⁶ Dick Reigelhuth, “Role and Function Statement: Fire Management, Yosemite National Park,” January 20, 1975, Yosemite National Park Archives.

⁷⁷ Fire Control Officer to Superintendent and Chief Ranger, GLAC, January 10, 1975, Glacier National Park Archives, 1910-1984 Collection, 306-5; Fire-Related Biological Fact Sheet,” National Park Service, April 1975, Yellowstone National Park Archives, Y-218; Draft, Fire Management Section, 3/31/75, Yellowstone National Park Archives, Y-218; Sellers and DeSpain, “Fire Management in Yellowstone National Park,” 108-12.

A national process was codified in 1976. Staff Directive 76-12 set out to clarify terminology and procedure for the burn program. “The use of fire is coming into its own across the Nation,” the document read. “Once considered a tool for habitat management, it is now acknowledged as vital to perpetuating certain natural systems.” The document articulated the NPS’s newfound primacy in fire management, saying “The incorporation of natural ignitions from lightning into management programs has been led by this Service.” The NPS had become the innovator; with no precedent technology, it must develop its own. The directive explained the change in terminology from “fire control” to “fire management,” a semantic redefinition that “more accurately reflect[ed] the increasing complexity of the Service-wide program,” and formally linked fire management to the emerging field of resource management. This shift reflected a shift in the meaning of NPS fire terminology. It described suppression activities in a new light, as situations where “sophisticated technology is joined by trained qualified fire managers to minimize loss of resources.”⁷⁸

Staff Directive 76-12 took its cues from the tripartite strategy that Bruce Kilgore designed more than five years before. The National Park Service sought to blend fire suppression, management use of fire, and research into “a cohesive program to perpetuate the resources entrusted to park management.” With its set of standardized definitions, the document outlined NPS formats and procedures for fire reports, articulated different funding sources that could be used to pay for fire management, mandated fire management plans for every area in the system and presented a skeletal outline of how they should be organized. It also developed qualifications and staffing protocols, and outlined fire research programs at the individual park level.⁷⁹

Even as the National Park Service was developing Staff Directive 76-12, an effort to codify standards and qualifications for everyone engaged in prescribed fire sought to add to the general upgrading of policies and procedures. The National Park Service had an agreement with the Forest Service to include its staff in the Interagency Fire Qualifications System, a rating system that allowed for standardized evaluation of personnel from different agencies, but the NPS also needed its own standards specific to its mission. Based on the work of rangers Art Partin and Larry Bancroft and others at Sequoia and Kings Canyon National Parks, the proposal identified nine distinct jobs with specific duties; the attributes necessary to qualify included physical fitness, experience, and subjective traits such as good judgment and observational ability. Courses of study necessary to qualify also were outlined. The program had been designed expressly for Sequoia National Park. Expanding it to a national program that worked in the sixty-eight parks the NPS had already identified as needing such personnel required careful analysis.⁸⁰

The National Park Service had reached an initial plateau in its pursuit of fire management. Until Staff Directive 76-12, the NPS had permitted a decentralized fire

⁷⁸ Associate Director, Park System Management to Directorate, WASO Division Chiefs and All Park Superintendents, Subject: Fire Management, July 22, 1976; Interim Fire Management Program, Staff Directive 76-12, Yellowstone National Park Archives, Y-218.

⁷⁹ Interim Fire Management Program, Staff Directive 76-12, July 22, 1976, Yellowstone National Park Archives, Y-218.

⁸⁰ Associate Director to All Regional Directors, July 18, 1976; W. A. Partin, “Green Card,” Glacier National Park Archives, 1910-1984 Collection, 306-8; Regional Director, Western Region to Superintendents, Western Region, May 13, 1976, YNP 32.

management policy. The document finally created a national structure to supercede local autonomy, signaling that the moment in which fire management depended solely on the interest of superintendents was coming to a close. In turn, this new policy demanded consistent attention from higher levels in the NPS, as well as a full-fledged commitment of Service resources. Fire management had reached a first stage of maturity.

The maturation process led to continued assessment and refinement of NPS fire management policies. A task directive signed by Director Gary Everhardt on November 1, 1976, commanded an assessment of past and current practice, consideration of alternatives, and the development of a recommended course of action and a schedule for an efficient Service-wide fire management program. It announced an additional \$1 million in annual emergency funding to supplement the existing program, which expended more than \$1.3 million annually for prevention and suppression. The directive anticipated a reformulation of the fire management program during the subsequent fire years to allow it to account for the differences among the 287 national park units. It created a task force to design a comprehensive operational program that included many of the leaders in NPS fire management – including David Butts, John Bowdler, Robert Sellers, William Colony, Larry Bancroft, and others. They were expected to use their expertise and knowledge to develop specific recommendations. The group was given five months to achieve this enormous goal, a relatively short period to develop the complete structure requested.⁸¹

Early in 1977, a new staff directive, 77-1, further elaborated on the structure of fire management and the division of responsibilities associated with it. As a result of the task force created under the earlier staff directive, the NPS took two major steps. The Service created a direct line for fire management in the administrative structure, and interagency cooperation became a primary concern. Neal Guse, division chief of natural resource management in the NPS Washington office, was designated as coordinator of the program. David Butts, also of the Washington office Natural Resource Management staff, was selected to oversee team leader Robert Sellers. John Bowdler was assigned to the Boise Interagency Fire Center (BIFC), the interagency endeavor begun in 1965 to centralize resources and strategies for addressing fire, to develop NPS-BIFC, coordinate NPS training, and serve as liaison to other federal agencies. These steps were a prelude to better integration of the fire management program in overall NPS management.⁸²

These effects at standardization led to efforts to tighten nomenclature. In any discussion of fire, the NPS realized, the chance of being misunderstood loomed large. “It is important we choose our words and phrases carefully when discussing our fire policy and fire management program with anyone, including conversations among ourselves,” Western Regional Director Howard Chapman told his staff early in 1975, more than four years after Sequoia and Kings Canyon Superintendent McLaughlin cautioned his parks about their choice of language. “We must not use words or phrases in a careless ‘because everyone knows what I mean’ manner,” Chapman said. The Forest Service and the NPS

⁸¹ “Task Directive for Fire Management, October 1976,” Yellowstone National Park Archives, Y-225; Regional Chief Scientist, Operations, Midwest Region to Research Scientist, Grand Teton National Park, December 16, 1976,

⁸² Associate Director, Management and Operations to Directorate and Field Directorate, Fire Management Program Responsibilities: WASO and NPS-BIFC, Staff Directive 77-1, February 24, 1977, Y14-550, National Park Service Historical Collection, Harpers Ferry, W.V.

worked to develop a shared nomenclature as interagency cooperation became increasingly crucial, but the language they used was exclusive to people in their field. In most circumstances, only specialists understood the difference between natural fire, prescribed fire, prescribed natural fire, and the other listed categories.⁸³

Staff Directive 77-1 promoted two important goals for the National Park Service. It served as the culmination of efforts to standardize training and make it cohere with the programs in other federal agencies, and it created a context in which fire management plans could be developed and implemented. In addition, it also established chains of command and authority to govern emergency fire situations, and placed BIFC, with its greater capabilities, at the center of NPS response. The directive continued the standardization of fire management, pulling it further from its decentralized roots and closer not only to a standardized Service structure, but also to the interagency coalition at BIFC that was increasingly central to federal fire response. Directive 77-1 represented further maturity of the NPS fire management program as well as the first comprehensive effort to bring it in line with other Service programs.

Such efforts ultimately led to NPS-18, the National Park Service Fire Policy Directive, which in 1977 became the dominant document for fire management in the National Park Service, superseding every existing directive and policy. NPS-18 represented a full-fledged reinvention of policy, a compendium of the ideas and strategies learned in the decade since the 1968 Green Book included the use of fire. The new document was complex, for it covered a vast array of contingencies. NPS leaders recognized that a combination of management strategies and implementation procedures were necessary to create policy for almost 300 disparate units. The policy reiterated clear principles: as in 1968, NPS priorities were to protect lives, facilities, and cultural properties, and to preserve natural resources and habitat. It articulated clear guidelines for prescribed burning. It also separated fires into two categories: management fires, which were allowed to burn, and wildfires, which were to be suppressed.⁸⁴ The NPS terms had changed, but the rules were consistent. The Service would determine which fires it would allow to burn.

The prescriptions in NPS-18 were clear and direct. The document standardized terminology, so that throughout the NPS, descriptions and procedures would be defined in the same ways. “Fire control” was removed from the NPS lexicon and replaced by “fire management.” “Control is but one of the many appropriate parts of fire management,” the policy intoned. It also located fire management inside the national resource management administrative structure. Even though such a transfer was never carried out in a systematic fashion at the park, regional, or national level, the concept represented a major shift from the individualized and idiosyncratic practices that had been implemented by superintendents in each park. NPS-18 also compelled each park to evaluate its fire situation and create a fire management plan. No longer could a

⁸³ Regional Director, Western Region to Superintendents, Western Region, State Director, Hawaii, Chief, Arizona Archaeological Center, Directorate, Western Regional Office, Yosemite National Park Archives, Y 14 Forest Fire Control, 1914-1975 Regional Director, Western Region to Superintendents, Western Region, State Director, Hawaii, Chief, Arizona Archaeological Center, Directorate, Western Regional Office, Yosemite National Park Archives, Y 14 Forest Fire Control, 1914-1975.

⁸⁴ National Park Service, “Fire Management Policy, NPS-18, 1977,” Glacier National Park Archives, 1910-1984 Collection, 306-8; Summers, “The Administration of Fire Management Within the National Park Service,” 13-17.

recalcitrant superintendent simply ignore fire issues. Even small historical units were required to develop such plans, albeit not always with the speed or scope that was expected of parks with long histories of fire. Even parks with what NPS-18 described as “100 percent landscaped vegetation” were required to complete a fire plan. The only parks exempted were those with no vegetation – typically small urban memorials.⁸⁵

NPS-18 created a national structure for fire management, and it represented the first comprehensive attempt to bring the disparate practices that had grown up since 1968 under some form of central control. This evolution reflected both the growing recognition that fire was a crucial factor in national park management and the need for centralized procedures to govern its use and management. NPS-18 fit the National Park Service firmly into the Department of the Interior’s organizational structure for fire, for the addition of the NPS to BIFC brought the Service in line with the rest of the department. The result was a powerful shift in Interior fire operations, including a sea change in Forest Service policy. That agency, long committed to suppression, accepted fire management and the use of fire in the 1978 *National Forest Manual*. Fire management, NPS style, became the dominant mode of federal fire response.

With NPS-18, the National Park Service had divided fire into three distinct categories – human-induced, natural, and prescribed. A management system had been established for each, with checks and balances and objectives to be obtained. It seemed an ideal system, clearly defined and focused, that would allow the NPS and other federal agencies to maintain control of fire. Fire managers could be forgiven if they believed that they had triumphed not only over arcane policy, but over nature itself. They firmly believed that they had the science right; that they understood fire and its circumstances, and had devised strategies to make it work for all the national parks. As with any policy, a test would come, most likely when the reality of specific fires challenged the structure the National Park Service created.

⁸⁵ National Park Service, “Fire Management Policy, NPS-18, Release 1, August 23, 1979,” National Park Service Historical Collection, Harpers Ferry, W.V., 1-2.

Chapter 6:

Institutionalizing a Structure for Fire Management

During the late 1970s, the National Park Service experienced significant upheaval that refocused its mission in new ways. Changes at the top that began with the appointment of Ronald Walker as NPS director in 1973 continued, with a rapid succession of directors following throughout the decade. Gary Everhardt, an engineer by training and former Superintendent of Grand Teton National Park, succeeded Walker early in 1975. A genial, calm, and cautious man, Everhardt found the director's post to be more intense than any previous management he had experienced. He left within two years, succeeded in 1977 by William Whalen, the superintendent of one of the premier urban national parks areas, Golden Gate National Recreation Area. Whalen himself was replaced not three years later, in May 1980. In this span of eight years, three directors led the NPS. No prior director, with the exception of Arthur E. Demaray, a long-time associate director who was appointed as director for nine months prior to his retirement in 1953 in a gesture of appreciation for his long service, served less than eight years. In the view of much of the NPS line staff and many observers, the top post in the NPS had become politicized, a demoralizing turn of events that dramatically altered more than a half century of apolitical leadership of the National Park Service.¹ This lack of continuity at the top hurt fire management at precisely the moment it moved toward institutionalization within the Service.

The turbulence that existed within the fire program stemmed from a number of structural issues. Despite the passage of NPS-18, the original NPS fire policy, the Service lacked a unifying presence. Implementation of NPS-18 lagged behind its philosophical statement, as experimentation continued to proliferate throughout the system, as energetic and enthusiastic fire managers applied their ideas to individual parks. Many surprises resulted, both from planned fires and natural ones. The NPS discovered that when every park needed a fire management plan, the question of applicability loomed large in many settings. The instability at the top of the National Park Service reflected a parallel instability in fire management. Despite valiant efforts to design and implement fire policy for the entire park system, the efficacy of the newly designed process remained tenuous.

Enactment of NPS-18 did create a new confidence among those who advocated the use of fire, for adoption of the policy signified the passage of their ideas from outlying vision to core NPS value. It built a structure for the use of fire that took the practice from the fringe and brought it into the center of NPS management policy. NPS-18 became the center of the process of institutionalizing fire management in the National Park Service. A series of management protocols developed, many in response to specific park situations. The emphasis on planning grew dramatically, and the NPS could feel that it had outlined patterns of fire management that made sense and reflected Service values and the growing body of science that supported them. Yet a vast difference remained

¹ Ronald Foresta, *America's National Parks and Their Keepers* (Washington, D.C.: Resources for the Future, 1984), 89-91; William Everhart, *The National Park Service* (Westport, CT: Greenview Press, 1985), 153-54.

between the embrace of policy as a philosophy and its outline of implementation and the ability to apply it on the ground.

Even as NPS-18 was enacted, congressional action provided support for the major transformations in NPS management that followed the Leopold Report. The Redwood National Park Expansion Act in 1978 placed a new premium on resource management. Once resource management had housed fire management, the rubric under which the prescription to use fire hid in an era when suppression advocates still dominated NPS policy. The new set of ideas contained in resource management competed for predominance with the traditional concept of complete suppression within the NPS, but without the comparatively large base of resources then devoted to fire control. In the fifteen years that followed the Leopold Report, fire management won out over complete suppression as a philosophy, even as suppression remained a viable response in many types of situations. The National Park Service followed a vision that dictated a new change in strategy. Done properly over time, in an ideal world, natural and prescribed fire would, it was believed, obviate the need for most suppression activity.

This change furthered the centrality of the use of fire in NPS management. From roots in resource management, natural and prescribed fire became a primary tool of the NPS's effort to manage fire on its lands. The shift in emphasis was significant. Fire management superceded fire control – the ideal of complete suppression – as the main avenue of response to blazes. The use of fire and resource management became uncoupled, allowing a broader vision of the applicability of fire than could have been conceived as a resource management tool. As resource management ascended as a goal of the NPS mission in 1978, this new significance meant much less to fire management than it might have a decade before. The terms of the battle about the virtues of fire control shifted inside the NPS: Suppression proponents diminished both in number and influence, leaving the way for fire management to move to center stage in NPS fire policy.

Yet conditions were rife for change in the National Park Service. The fact that a piece of congressional legislation instructed the NPS on its mission was a telling sign of a government agency that had lost its direction. Those who saw disarray in the NPS pointed to the turnover at the top and to greater congressional interest in the Service mandate as evidence of a weakening federal agency. The new mandate ordered the NPS to redefine approaches to its management obligations. Fire had been a catalytic factor in that process since the change in the Green Book in 1968. The institutional transformation of the Service furthered changes in fire management and cemented the context in which they occurred.

The National Park Service faced a different set of constraints than did its peer federal agencies. The NPS had embraced fire management ahead of agencies such as the Forest Service, which followed a more circuitous path to fire management. The USFS hid its shifting emphasis toward fire under the loose category of wilderness management, using the mandate of the Wilderness Act as a way to institute a revolution in policy. “I had clearly in mind in 1971 that we needed to get fire into all of our ecosystems,” Orville Daniels, USFS supervisor of the Bitterroot National Forest, recalled in 2000, “and that the best place to start was wilderness.”² In effect, the Forest Service acquiesced to the

² Quoted in David Carle, *Burning Questions: America's Fight with Nature's Fire* (Westport, CT: Praeger Press, 2002), 177; Stephen J. Pyne, *Fire in America: A Cultural History of Rural and Wildland Fire* (Princeton: Princeton University Press, 1982), 293-94.

ideals the National Park Service first put forward in 1968. Long the leader in fire suppression, it now ceded the lead philosophical position in fire management to Department of the Interior agencies, chief among them the National Park Service. The actual rise of the NPS and the Forest Service slide was a much longer process.

The idea of the national parks as “vignettes of primitive America” and the emerging effort to define designated wilderness under the Roadless Area Review and Evaluation process, colloquially referred to as RARE I and RARE II, accentuated the changes and made the NPS’s position even more tenable.³ The shift was called “process preservation” – protecting the ecological processes, not the scenery. This was an important shift on several counts that directly clashed with the Service’s concern about visitor experience, as it posed a particular threat to the vistas visitors craved. The widespread preoccupation with the idea of “natural” lands – as a social construct rather than an environmental condition – easily included the use of fire. As a “natural” element, fire readily fit prevailing sentiments. Its inclusion as a force that shaped nature mirrored scientific and popular ideas about how to best manage precious national lands and resources.

In the choice among types of fire, “prescribed natural fire” – fire ignited by lightning in areas the Service designated as zones in which fire was allowed to burn – was widely seen as the most desirable. Natural in origin, such fire expressed the values of the era: that national parks were products of natural processes and human intervention only muddled their ecological purity. Wilderness provided the template for “natural.” This perception was of a piece with the times, idealistic rather than pragmatic, yet it had powerful influence on policy. The emphasis on “natural” changed the National Park Service; it contributed greatly to acceptance of the idea of natural fire inside the NPS and in the larger conservation community.

During the rush to embrace natural fire, National Park Service efforts to keep control of this process relied on the developing management structure. NPS-18 became the baseline policy document that served as the best hedge against idiosyncratic use of fire. It reversed the trend toward local autonomy that had been the hallmark of the Green Book, effectively reinstating a centralized management style reminiscent of the era of the NPS’s first fire professional, John Coffman. Even with the new rules, NPS superintendents retained the autonomy that had characterized the Service since its founding. “A superintendent, particularly if he is some distance away from [the regional office] and is somewhat isolated, he really runs that place and can do as he damn [well] pleases and usually does,” observed long-time NPS veteran Roy Appleman in a succinct assessment of the office’s power.⁴ In most circumstances, such power translated into effective local management. In the case of fire, local management could not only be insufficient to grapple with the issue’s potential dimensions, lack of centralized control could be dangerous, extraordinarily expensive, and transformatively destructive as well.

³ USDA Forest Service, *RARE II: A Quest for Balance in Public Lands* (Washington, D.C.: U.S. Government Printing Office, 1978); M. Rupert Cutler, “National Forests in the Balance,” *American Forests* (May 1978), 1-5; M. Rupert Cutler, *Western Wildlands: A Natural Resource Journal* 5 (Summer 1978); Tim Mahoney, “RARE Draft EIS Sparks Heavy Input from Conservationists,” *Wilderness Report* 15 (September 1978); David Crosson, “RARE Results Final ‘An Acute Disappointment,’” *High Country News*, January 12, 1979.

⁴ Roy Appleman, interview by S. Herbert Evison, February 10, 1971, S. Herbert Evison Papers, CONS31, FF5, Denver Public Library, Denver, CO, 30.

Following the NPS policy manual, the creation of the Service's Branch of Fire Management, located at the Boise Interagency Fire Center, and enforcement of the requirement that each park develop a fire management plan showed a new intensity in the approach to fire. If local autonomy was going to survive, it would do so under specific strictures and in accordance with plans and programs that had been reviewed and accepted up the chain of command.

A certain amount of tension arose between the local and national levels. It centered on the planning process and the amount of land that was to be burned. Into the early 1980s, most intentional burning on NPS lands took place in Florida at Everglades National Park, and after its establishment, at Big Cypress National Preserve, established on October 11, 1974. These Florida parks moved into the mainstream as ecological values came to dominate the management of nature preserves. As two of the most heavily burned park areas in the national system, Everglades and Big Cypress shared the most comprehensive experience with fire. In 1982, Big Cypress staff completed an environmental assessment that allowed human-induced and natural fires to burn under predetermined conditions and initiated burning to meet management objectives under specified described circumstances. The plan extended historic practice at Everglades and reflected a decade of experience at Big Cypress. The conditions in Florida and regional cultural history made the use of fire a common and accepted practice, fraught with none of the baggage of the drier western parks. The practice was so common in the region that the state's regulatory process seemed to encourage rather than restrict burning. By the end of the 1980s, the State of Florida certified burn managers – some of them private citizens – to conduct prescribed burns; these people were not liable for damage caused by a prescribed fire as long as they followed state guidelines.⁵

Elsewhere, prescribed burning remained problematic. In many instances, prescriptions – the predefined conditions under which fire was allowed to burn – were loosely or poorly defined. Despite the Service's emphasis on planning, there were no national standards or models on which superintendents could rely. As a result, prescribed burning programs proliferated with too little planning and without clearly defined parameters. The circumstances sometimes made chaos of policy.

The challenge of fire continued to defy bureaucratic definition, and during the late 1970s, examples illustrated the problems that could stem from the transition to the new policy and the consequences of long-time suppression. Even advocates such as Bruce Kilgore, who was honored in 1974 by USFS Chief John McGuire for his contribution to fire ecology and "bridg[ing] the gap between fire research and the application of research findings to on-the-ground management," were tested by the circumstances. Controlled fire was one dimension; it was easy to argue that the public would accept fire if it was explained to them wholly and openly, as Kilgore argued in 1974.⁶ It was much harder to achieve that goal when fire threatened not only national parks but the areas surrounding them.

Across the national park system, fire management planning moved to the forefront. Even before NPS-18, new fire management plans flourished. In response to Special Directive 79-5, an astonishing number of plans were written in late the 1970s and

⁵ Environmental Assessment: Fire Management, Big Cypress National Preserve, March 1982, Technical Information Center, Denver Service Center, D-21A, 4-8; Carle, *Burning Questions*, 216-17.

⁶ Carle, *Burning Questions*, 180-81.

early 1980s at all manner of park areas. Parks as diverse as Mammoth Cave National Park and Antietam National Battlefield constructed fire plans. George Rogers Clark National Memorial, a 24.3-acre manicured greenspace around a 1920s memorial in downtown Vincennes, Indiana, produced a one-page fire management plan, “with reasons for its brevity clearly stated,” observed Superintendent Robert Lagemann. “The potential for wildfires at this park is minimal,” the plan’s author, Park Ranger Robert Holden, noted. “A fire of any consequence occurring on the grounds would be responded to by the City of Vincennes Fire Department.”⁷ Despite such truncated responses, NPS officials devoted a considerable array of resources to complying with NPS-18 at parks with little in the way of a history of fire. Critics suggested this was a one-size-fits-all model, the result of a struggle for control of the fire management process. A harsh and perhaps overwrought judgment, this perspective correctly pointed to the investment of resources in fire plans at parks with insignificant resources as a cause of a shortage of resources for fire at parks with long and complicated histories.

The new emphasis on fire plans produced a higher caliber of document than had ever before been possible in the National Park Service. Leading scholars played an instrumental role; in many ways, the concepts in the plans stemmed from their research and articulated the objectives their work fostered. A reciprocal energy linked the scholars to the Service in the new fire management plans. In some cases, scholars took the lead in developing the plans. At Pinnacles National Monument, James K. Agee and Harold H. Biswell coauthored the park’s first comprehensive fire management plan. The two presented the plan at the first Conference on Scientific Research in the National Parks in New Orleans, Louisiana, in November 1976. Their document assessed the evolution of fire practices at the 14,500-acre monument, showing the ecological consequences of suppression and the need for a program that used fire as a tool. Sophisticated in approach and cognizant of contingencies, Agee and Biswell’s plan set the standard for the NPS. Agee continued research there for more than two decades.⁸

Following the lead of scholars such as Biswell, Agee, and Jan van Wagtenonk, the parks with the most difficult fire histories developed fire management plans of remarkable flexibility and versatility. Glacier National Park’s document revealed a complicated evolution of its fire planning. The 1977 fire management assessment provided the most comprehensive analysis of conditions in the park’s history. Embracing the idea that fire was a natural force, the park sought strategies that would “perpetuate Glacier’s wilderness, with the greatest safety for residents, visitors, and non-park property.”⁹ Following the organizational model that developed in response to the

⁷ Superintendent to Regional Director, October 18, 1979; “Fire Management Plan,” (George Rogers Clark National Memorial) n.d., Denver Service Center, Technical Information Center, 440/D-20; Leon Liscomb, “Draft: Fire Management Plan, Mammoth Cave National Park, June 1978, Denver Service Center, Technical Information Center, 135/D-79; Gordon Olson, “Draft: Fire Management Plan, Antietam National Battlefield, Sharpsburg, Maryland, FY 1984,” Denver Service Center, Technical Information Center, 302/D-26, 1-3.

⁸ James K. Agee and Harold H. Biswell, “The Fire Management Plan for Pinnacles National Monument,” presented to the First Conference on Scientific Research in the National Parks, New Orleans, Louisiana, November 9-14, 1976, Denver Service Center, Technical Information Center, Denver CO, 114/D-38, 9-13; James Agee interview, June 10, 2004.

⁹ Jane E. Kapler, “Glacier National Park, Assessment: Fire Management, February 1977, Denver Service Center, Technical Information Center, Denver, CO, 11/ D-1143, sections 110-130, 271-345.2. The document is not paginated.

requirements of the National Environmental Policy Act of 1970, especially the environmental impact statement process, fire management plans expressed the preferences of managers in the language of alternatives. After describing the problem and the conditions under which management took place, parks offered alternative management plans and their expected consequences.

At Glacier in 1977, the park proposed four alternatives: continuing total fire suppression, allowing all fires that did not threaten human safety to burn, allowing selected lightning-induced fires to burn, and introducing fire by artificial ignition. The first two alternatives were clearly extreme. In the almost seventy years of history at Glacier National Park, total suppression had never successfully been achieved under any circumstances. “Although it seems very unlikely to us now, fire suppression techniques may become effective enough to eliminate large fires even in times of severe drought,” Forest Technician Jane Kapler, the report’s author, conceded. This prospect remained so remote that the NPS did not consider total suppression to be a viable alternative. The idea of allowing all fires that did not threaten human safety to burn was a dangerous possibility that returned fire into a bureaucratic category. Again, the model suggested administrative dominance of fire, a prospect that defied experience. The inability to allow human-induced fire to burn near developed parts of Glacier and the lack of data about historic natural fire patterns made this alternative unappealing.¹⁰

The caliber of alternative management plans varied. While Glacier National Park produced a remarkably sophisticated and comprehensive analysis of its fire situation, many other parks lacked the combination of resources and sense of necessity to invest as completely in designing a fire program. The plan that resulted from the Glacier assessment, approved in June 1978, articulated conditions under which prescribed natural fire and artificial ignition would be utilized as part of the park’s regime. The four alternatives were reviewed and rated. Allowing every fire to burn was clearly impossible, if for no other reason than the inordinately high frequency of fires that would result. Complete suppression was beyond the park’s reach; it was also counterproductive to offering visitors a glimpse of the landscapes they might have encountered as early American pioneers. The only alternatives that provided answers to Glacier’s fire problems permitted both the use of natural fire and ignited fire along with suppression. The plan targeted “certain critical sites” such as ponderosa pine stands for prescribed fire as a component of “maintaining a sound, natural ecosystem.” It permitted natural fire where “values at risk [were] minimal.” Yet the plan carefully deferred to the expectations of its neighbors. “Any action other than total suppression,” the report read, “requires a review and endorsement by a Fire Management Review Team.” This effort to assuage public concern reflected the realities under which the National Park Service operated and that some park plans failed to address.¹¹

The planning process triumphed at Glacier National Park. With the acceptance of the fire management plan, one of the most difficult fire parks in the system had a flexible administrative structure for addressing fires. The plan allowed park officials a tremendous amount of leeway in decision-making, with the powerful emphasis on those decisions that had become the hallmark of fire management. The new values – those of

¹⁰ Ibid., 312.5, 323.4.

¹¹ Glacier National Park, “Forest Fire Management, Glacier National Park, West Glacier,” Montana, June 2, 1978, Denver Service Center, Technical Information Center, 117/D-298, 1-3.

the use of fire – became the rule rather than the exception. A new era indeed had arrived. The National Park Service had developed a fire management structure that seemed as able as suppression had once been to address the problems of fire at a major park.

Yet planning was only half the equation. Even after two University of Montana professors, James R. Haback and Robert W. Steele, received a \$49,943 grant for a three-year fire ecology study in 1980, Glacier National Park was unable to undertake any proposed prescribed burns. The possible season for burning was always extremely short at Glacier, and in 1980, the ground cover was only dry enough to carry fire during one week. “Unfortunately we were thwarted by a series of crises over which we had no control,” acting superintendent Joe Shellenberger told Haback. The park endured a grizzly bear crisis that year that required the deployment of all available park personnel. Three fatal maulings were reported inside the park, the last just prior to the scheduled burn. Two female grizzlies were trapped inside Glacier; another was caught outside its boundaries. Nine grizzlies were counted in the West Glacier-Apgar area. “There was simply no one available to conduct a fire management burn,” Shellenberger informed the disappointed professor. Even though the research was “of some urgency,” the project was temporarily derailed by the situation and other management issues. Two years later, supported by the research of Ron Wakimoto at the University of Montana, Missoula, and Bruce Kilgore, during a four-year stint as Research Project Leader at the U.S. Forest Service Northern Forest Fire Laboratory in Missoula, Glacier National Park did finally prescribe-burn a ponderosa pine forest in the North Fork of the Flathead drainage in September 1983.¹²

Yosemite, which had become the Service’s premier fire management park as a result of the efforts of van Wagtenonk and others, also developed preeminent fire planning. By the late 1970s, van Wagtenonk’s work had laid the basis for a revolution in the park’s planning. In papers such as “Fire Management in the Yosemite Mixed-Conifer Ecosystem,” he outlined the achievements and the consequences of fire management, showing how Yosemite had measured its prescriptions for fire and how science changed the parameters of such planning. This work was reflected in the park’s 1979 fire management document, “Natural, Conditional, and Prescribed Fire Management Plan.” “The forest has become increasingly susceptible to catastrophic wildfire as both living and dead fuel loads continue to increase,” the plan stated. “The absence of the open park-like forest described by early explorers in the Yosemite region has resulted in the visual impairment of the natural scene, and consequently has decreased the value of the Park experience for many visitors.” This statement of the problem nicely summarized the need for scientific management, merging it with the visitor experience.¹³

¹² Acting Superintendent to Jim Haback, January 2, 1981; MAB Coordinator, WASO to Regional Chief Scientist, Rocky Mountain Region, March 31, 1981, Glacier National Park, Fire Collection 1910-1984, 306-11; Bruce Kilgore, “Evaluating Direct Response to Understory Burning in a Pine-fire-larch Forest in Glacier National Park,” Robert C. Lucas, compiler, *Proceedings – National Wilderness Research Conference: Current Research* USDA Forest Service General Technical Report INT-212 (Missoula: USDA Forest Service, 1986), 26-34.

¹³ Jan W. van Wagtenonk, “Fire Management in the Yosemite Mixed-Conifer Ecosystem,” Symposium on Environmental Consequences of Fire and Fuel Management in Mediterranean Ecosystems, Palo Alto, California, August 1-5, 1977, 459-63; Yosemite National Park, “Natural, Conditional, and Prescribed Fire Management Plan, 1979,” Denver Service Center, Technical Service Center, 104/D-845, 3.

The idea of conditional fire management – seasonal adjustment of which areas would be allowed to burn – allowed a new dimension in fire planning. At Yosemite, the fall months allowed greater management leeway, and under clearly described conditions, measured against a score of 50 on the Burning Index after September 1, conditional units that encompassed lower and upper mixed-conifer and red fir would be allowed to burn. Conditional fire management would terminate on December 31 each year to eliminate fires that carried over to the following spring. The plan allowed park officials to institute prescribed burns in the conditional areas under the same conditions.¹⁴

The Yosemite plan devoted a tremendous amount of energy to clearly defining the boundaries between conditional and natural fire. Prescribed burning units were already common in the NPS and their boundaries were clear. The innovation supporting the idea of a conditional zone – when it was precisely that boundary between allowing a burn and suppression upon which the board of review focused as the source of mismanagement at the Ouzel fire in Rocky Mountain National Park in 1979 – became even bolder in this context. The description of the boundaries, so precise that it seemed like a metes and bounds survey for measuring land, contained a detailed and accurate assessment of fire boundaries that exceeded the norms previously established for prescribed burns.¹⁵ The plan attempted to introduce a level of planning supported by science that had not yet been seen elsewhere in the park system.

This strategy affirmed complete confidence in the management of fire by science. At Yosemite, managers did not doubt the efficacy of fire management. Increasingly at the center of the fire management revolution, Yosemite showed the most direct influence of Biswell and his students. Its plan was unambiguous, articulate about the science behind fire, but seemingly purposefully tone deaf to the larger issues that concerned fire management. Yosemite planners produced one of the most advanced documents in the system, but it contained little recognition of the problems of managing fire in a public context.

Sequoia and Kings Canyon National Parks also had been at the center of the revolution in fire practice, and the parks produced one of the most comprehensive and sophisticated studies of the first generation of fire plans. Divided into three parts, the plan defined and described the park's natural resources, fire management zones, and the role of fire in the park's history; described the fire management program; and articulated the operating plan for implementation. Sequoia and Kings Canyon's complicated fire history and the long history of record-keeping provided some of the best information in the NPS for evaluating the role of fire. Few other parks could produce a chart that showed fifty-five years of fire history, with the frequency of fire categorized by origin: natural or human. The decade-long history of prescribed natural fire provided another dimension that many parks lacked. By 1979, the park had started 155 fires, which together burned across 19,730 acres. While the total paled in comparison to Everglades, it far surpassed any other park in the system.¹⁶

Sequoia and Kings Canyon's plan developed the most revolutionary dimension in National Park Service fire policy: the idea of introducing fire to areas where suppression

¹⁴ Ibid., 21-22.

¹⁵ Ibid., 41-43.

¹⁶ "Fire Management Plan, Sequoia and Kings Canyon National Parks, February, 1979," Denver Service Center, Technical Information Center, 102/D-300, I-1-3; IV-5-9.

had altered the natural fuel load and the composition of vegetation. The plan considered the option of allowing some human-caused fires to burn, a perspective easily regarded as a contravention of NPS-18, which required human-induced fires to be controlled to protect parks from unnatural ecosystem change and to prevent damage to property and lives.¹⁷ Sequoia and Kings Canyon had always been at the forefront of introduced fire, but the new plan increased its emphasis on allowing all kinds of fire to burn.

The most powerful claim in the plan for innovation stemmed from the vast base of prescribed burn research that underpinned its contentions. No park had ever produced the level of research presented in the Sequoia and Kings Canyon plan. It offered a twelve-year controlled burning plan, designated by area and size, with proposed burned areas total acreage ranging from highs of 19,758 acres to lows of 4,471 acres. The research was persuasive; the park's explanations were thorough and based in science. The work of the first generation of fire ecologists came to fruition in the 1979 Sequoia and Kings Canyon fire plan.¹⁸

But in an unusual way, the model it created was not applicable to all parks. The fire problems of major fire parks such as Sequoia and Kings Canyon were enormous and merited the immense investment in resources they received, but their situation did not mirror most of the parks in the system. The NPS found itself in what was a characteristically uncomfortable situation: investing vast quantities of national funding in particular parks that were extreme examples of one problem. This approach was entirely necessary, for it would not do to allow huge fires to devour the nation's treasured parks. But it also created policy on the basis of atypical examples and as a result focused on issues that usually pertained to a small but significant number of parks.

Sequoia and Kings Canyon National Parks continued to serve as the model park for fire management plans. In 1982, the two parks put forward another fire management plan, again a state-of-the-art plan based in science and the park's experiences. It took the level of detail a step beyond the 1979 plan, adding an implementation structure that defined precisely the ways in which fire information would be collected and disseminated. In a philosophical statement that seemed to reflect the experience of the Ouzel fire, the plan articulated a stance that made caution a primary strategy: "No fire should ever be considered too small or harmless for monitoring and as a result ignored."¹⁹

The plan resulted in a controversy that stretched throughout the rest of the 1980s. As Sequoia and Kings Canyon permitted fire, they experimented in myriad ways. One of the boldest programs was burning around a number of Big Trees, a symbolic statement of immense proportions. A resident of nearby Three Rivers, California, Eric Barnes was outraged by the char left by prescribed fire on the Big Trees and complained to Senator Alan Cranston, D-Ca. Bruce Kilgore drafted the response, explaining the ecological advantages of such fire, and helped empanel a seven-scientist committee headed by Norman Christensen of Duke University. The park suspended prescribed burning while the committee studied the program. In 1987, Christensen's committee released its report, generally supporting the controlled burning program. In the committee's assessment, the

¹⁷ Superintendent, Sequoia and Kings Canyon National Parks to Regional Director, Western Region, May 24, 1979, Denver Service Center, Technical Information Center, 102/D-330.

¹⁸ "Fire Management Plan, Sequoia and Kings Canyon National Park," February 1979, V-1-V-30.

¹⁹ "Sequoia and Kings Canyon National Parks, Fire Management Plan," June 1982, Denver Service Center, Technical Information Center, 102/D-330A, 119.

ecological value of fire superseded aesthetic considerations. The committee recommended two types of prescribed burns – restoration fires to reduce fuel load, and simulated natural fires, to mimic historic natural fire patterns.²⁰ Yet despite the affirmation of the parks’ ideas, the experience taught NPS personnel an important lesson: public involvement was necessary if the Service was to find public support for its policies. Sequoia and Kings Canyon had engaged the public and explained what it was doing and why in open forums. Despite the example, too few national parks followed this lead.

These new demands reflected the exuberance of the previous decade, tempered by the experience of fire management. Despite Bruce Kilgore’s optimistic predictions that information and clarity would sway the public, any time fire threatened any park facility or town, the public, the press, and elected officials reverted to suppression as the preferred approach. The Service realized that fire science and strategy had to be tempered by living in the real world, and throughout the NPS, superintendents, regional directors, public relations people, and everyone else finally understood this. Fire managers had little choice but to address the realities faced by the NPS and every other federal land management agency in the 1980s.

But most parks could not invest resources in the level of planning engaged in by Glacier and Sequoia and Kings Canyon. In some circumstances, such a decision made sense. Urban parks, historic homes, and other similar parks had more to fear from building fires than wildfire; suppression of a lightning fire was a given in city environments, and some such parks lacked anything more than a front lawn. The so-called “park of the month club,” the remarkable array of areas added during the 1970s at the behest of U.S. Representative Philip Burton of California, a great friend of the National Park Service but also a zealous manipulator of legislation to achieve his ends, created dozens of parks that differed greatly from earlier national parks areas.²¹ Parks such as the Thomas Stone National Historic Site in Maryland, the Edgar Allen Poe National Historic Site in Pennsylvania, and the Tuskegee Institute National Historic Site in Alabama had neither the need nor the structure to produce a fire management plan of the caliber of Glacier National Park. Immediate suppression was necessary and expected at such parks; there was nothing to gain from allowing natural fires to burn and intentional ignition bordered on prosecutable pyromania.

Some parks produced surprisingly cavalier responses to the dictate to produce a fire management plan. A prominent example was the Custer Battlefield National Monument, later designated as Little Bighorn Battlefield National Monument. Where Agee and Biswell developed a seventy-page document for Pinnacles, and Glacier National Park expended more than 200 pages on a mere assessment, a prelude to a fire plan, Custer Battlefield assembled a four-page plan that showed no understanding or comprehension of the idea of fire management, the use of fire as a resource management tool, or any of the other innovations that had followed the revolution in NPS thinking about fire. In essence, the park submitted a plan that advocated suppression. It listed resources, fire equipment, details of a training program, explanation of its reliance on the

²⁰ Carle, *Burning Questions*, 184.

²¹ John Jacobs, *A Rage for Justice: The Passion and Politics of Phillip Burton* (Berkeley: University of California Press, 1995), 300-07; Barry Mackintosh, *The National Parks: Shaping the System* (Washington, D.C.: U.S. Department of the Interior, 1991), 86-89.

BLM, and a description of the fire crews available both winter and summer.²² Whether Superintendent Richard T. Hart simply did not track the changes in fire policy or whether Custer Battlefield's unique circumstances – its position as a cultural site and de facto cemetery – dictated a different vision, the fact remained: the fire management plan submitted in 1977 was more reminiscent of the era of suppression than of the decade since the introduction of prescribed fire.

Yet Custer Battlefield became a test case of the impact of fire on park cultural resources. In 1983, a fire swept up Deep Ravine and burned the park's grasslands. The 1876 battlefield had experienced fire suppression for a very long time – some accounts suggested it had not burned since the battle– and the complete burn of the historic section of the park provided the first opportunity to use modern archaeological techniques to reassess the battle's historic scene. NPS archaeologists spent the 1984 season on the newly cleared field, uncovering bullets, skeletal remains, metal fragments, and other remnants of the battle that redefined the historical understanding of what transpired. Their work developed a new scenario of the battle, one that more closely coincided with the accounts of Lakota and Cheyenne people than with the mythmaking of the moment and its subsequent popularization by Hollywood. A different understanding of Indians' use of weapons, of the flow of the battle, and of other dimensions of the story resulted.²³

The Custer Battlefield fire and its impact on historical knowledge opened another area in which fire could be transformative. Although Mesa Verde National Park had experienced archaeological discoveries as a result of fires, the idea that fire could contribute to resource management had not been in the forefront of NPS thinking. The conceptualization of the value of fire had come almost exclusively from natural scientists. Despite the obvious advantages of fire for preservation, cultural resources had been an afterthought. The situation at Custer Battlefield provided a new appreciation for the role of fire in other types of NPS management situations.

In December 1981, NPS Director Russell Dickenson committed the Service to FIREPRO – an operations analysis and budget management process modeled on similar programs in other Department of the Interior agencies and in the Forest Service. It utilized a common process to enable land managers to systematically analyze and quantify fire management needs. This information provided a baseline for appropriate levels of personnel, training, equipment, and supplies to achieve resource management goals.²⁴ FIREPRO was the first National Park Service effort to address the financial demands of the new fire management structure.

FIREPRO sought to protect cultural and natural resources by assessing the level of risk to each and deploying resources based on that risk. It built on existing efforts such as the use of Activity Standards in the early 1970s and Zero Based Budgeting of the end of the decade to move the National Park Service toward management by objectives. The program treated the potential for wildland fire in proportion to its historic rate of occurrence, shifting the focus away from the ongoing development of fire plans for urban

²² Superintendent, Custer Battlefield National Monument, July 7, 1977; "Fire Plan," Denver Service, Technical Information Center, 381-D-31, 1-4.

²³ Douglas D. Scott and Richard A. Fox, *Archeological Insights into the Custer Battlefield* (Norman: University of Oklahoma Press, 1987), xi, 108-26.

²⁴ Memorandum, Director to Directorate and All Regional Directors, Subject: FIREPRO, NPS Normal Year Programming, December 22, 1981, Glacier National Park, Fire Collection 1910-1984, 306-11; Director to Park Managers, October 7, 1982, copy provided by Stephen J. Pyne.

parcs and other places where NPS resources were not likely to play a major role in fire planning and response. FIREPRO established three levels of response, with level III denoting the highest level of occurrence and danger of repeated fires. The National Fire Danger Rating System Burning Index served as the measurement for assessing the levels. In essence, FIREPRO attempted to balance response through the division of resources ahead of a blaze rather than in its aftermath. This simultaneously stabilized the NPS fire budget and let parks plan for emergency situations without depleting their ordinary operations budgets.²⁵

In the larger picture of federal fire management, FIREPRO helped the NPS catch up to the funding mechanisms and structures of other agencies. The Forest Service had been the leader in the movement, creating the perception that it could quantify the economic value of the lands it protected. FIREPRO let the NPS out of the box of the perennial lack of funding; at the same time, it redefined fire as a national phenomenon rather than a local or regional one. Partly FIREPRO was an attempt to create something like a national system where none existed, particularly useful as the NPS responded to the conceptual transformation of management embodied in the Leopold Report. Simultaneously, it was an attempt to secure more funds for NPS fire management and to explain and make significant such expenditures. The core account, called PWE 342, was designed to be used only for emergency funding, but the efforts of adept administrators created a situation in which national parks used these funds in lieu of their regular budgets. FIREPRO gave NPS fire management access to a new level of resources.

Fires continued to thwart the best efforts of planners, for the emergencies often fell well outside of the categories that the NPS could devise to contain them. In the summer of 1977, a fire at Bandelier National Monument, outside Los Alamos, New Mexico, called the question. In many ways, the situation at Bandelier was reminiscent of the Waterfalls Canyon Fire in Jackson, Wyoming, in 1974, but with an important difference. The nearby Los Alamos Scientific Laboratory (LASL), where the atomic bomb had been developed in the 1940s, remained a primary scientific research facility for the U.S. Department of Energy. Significant scientific laboratories, weapons development facilities, and hazardous materials abounded near the national park on the Pajarito Plateau, about thirty miles due northwest of Santa Fe, New Mexico. If residents of Jackson were disturbed by plumes of smoke in 1974, the health risks from a severe fire near Los Alamos were significantly greater.

A suppression regime had been in force in northern New Mexico since the New Deal. The combination of agriculture, development of the Los Alamos facility, and post-war growth of the region contributed to suppression of all fires on the plateau. By the 1970s, fuel loads were elevated throughout the area, triggering precisely the kind of situation Kilgore feared when he observed that a delay in addressing questions concerning fire created a situation where “in the long run, fuel accumulates and another manager at a later time faces an even tougher decision.” The vast increase in density of groundcover and the almost total halt of the natural cycle of ecological replacement that natural fire had long prompted increased the likelihood of a major fire at Bandelier or elsewhere in the Jemez Mountains. Testing at LASL compounded the general uneasiness

²⁵ FIREPRO, n.d., provided by Stephen J. Pyne, I-1, II-1-3.

of the people of Los Alamos and the rest of the plateau. The possibility of an accident at the Lab igniting a serious fire remained very real.²⁶

While federal agencies did an excellent job of suppressing fires on the plateau, the region's fire history suggested that such successes could not last forever. NPS fire managers experienced dozens of similar situations that preceded difficult fires and they awaited any outbreak with dread. It arrived late on the afternoon of June 16, 1977, a spark from a cigarette or a motorcycle engine smoldered in a pile of leaves on the Mesa del Rito in the Santa Fe National Forest. "The fire was started by a couple of kids on motorcycles back up in the woods one day," NPS Fire Specialist John Lissoway recalled. "The wind was blowing, it was hot, in the middle of June. I think they were out there without a spark arrestor or smoking cigarettes."²⁷ It grew into the largest fire on the Pajarito Plateau in the twentieth century.

Known as the La Mesa Fire, this blaze illustrated the problems of the new NPS fire regime. Human-induced, the fire met the conditions for suppression, but it spread so quickly that the response became a valiant effort at containment. Hot, dry, windy weather and dense fuel loads near the ignition point quickly fed the fire. Within ninety minutes of the initial sighting at about 4 p.m., the fire covered more than fifty acres. It spread from the Mesa del Rito area into the national monument by midnight on June 17, and by noon the next day, the fire crossed State Highway 4, headed toward Los Alamos. It grew in concentric circles each day, spreading on the east to within about three miles of Bandelier's headquarters at Frijoles Canyon. Weather worsened the situation for the next few days, as winds revived the fire a number of times just as it seemed to lose intensity. By June 21, intermittent thunderstorms slowed the fire, and officials declared it contained in what was conservatively estimated at 15,000 acres at 3 p.m. Two days later, after continuing heavy rain and cool temperatures, the fire was considered under control at 4 p.m.. Only the most vigorous efforts and complete commitment of resources prevented the fire from reaching the LASL technical areas southeast of Los Alamos, and for at least a day, the town itself was in danger.²⁸

The damage was devastating. Raging for more than a week, the fire burned across more than 23,000 acres, including more than 10,000 acres of timber in the northwestern portion of Bandelier, and an additional 5,000 acres in the adjacent national forest and on LASL land. The NPS evacuated families at the park headquarters at Frijoles Canyon early in the fire. Cinders and burning ash fell in the nearby town of White Rock, about seven miles from Los Alamos. Wood-shingled roofs there were hosed down constantly in the effort to prevent them from igniting.

The fire demanded every available human resource. Fire fighting crews from the Los Alamos Scientific Laboratory, the NPS, the Forest Service, and other federal, state, and local agencies threw in together to face the threat. The effort enlisted 1,370 people to stop the fire's progress, and nine bulldozers, twenty-three ground tankers, five helicopters, and five air tankers provided support. Firefighters swung their Pulaskis in

²⁶ Bruce Kilgore, "Introduction – Fire Management Section," in E. V. Komarek, ed., *Tall Timbers Fire Ecology Conference Proceedings* (Tallahassee, FL: Tall Timbers Research Station, 1976), 7-9; Hal K. Rothman, *On Rims and Ridges: The Los Alamos Area Since 1880* (Lincoln: University of Nebraska Press, 1992), 273-77.

²⁷ John Lissoway interview, by Lincoln Bramwell, August 15, 2002.

²⁸ Rothman, *On Rims and Ridges*, 275.

two twelve-hour shifts around the clock in the heavy smoke; many slumped exhausted at the end of their shift, to rise again in the morning and repeat the battle.²⁹

One of the fire's most dangerous dimensions was its possible interaction with the Los Alamos Scientific Laboratory. The National Park Service had never faced a fire in proximity to a scientific research facility; in the rare cases an NPS fire had intruded on the activities of the military-industrial complex, Department of Defense and military fire crews had handled the fires. Los Alamos was peculiar. A subsidiary of the University of California system, it lacked the personnel to respond to such a blaze and was forced to rely on the NPS and the Forest Service. Many of its technical facilities were close to the burn area, and due to national security concerns, no one outside of LASL knew what they contained. As the fire penetrated the park and approached LASL facilities, NPS officials had two major worries: LASL was politically powerful and secretive, leading the NPS to act gingerly, and there were real constraints in any strategy. LASL was loaded with combustible and toxic material and its officials could not provide what the NPS regarded as essential information. John Lissoway remembered that officials at LASL "did not know how much heat it would take to blow" up stored explosives and the NPS was not privy to the location, quantity, and character of such stockpiles.³⁰ Managing this fire required even greater political skill and calm than any of its predecessors.

The La Mesa Fire became an important test of the multi-faceted mission of resource management. Along with the evolution of the use of fire as a tool, fire management included cultural resource management. The burned area was filled with subsurface prehistoric ruins, and quick thinking by NPS officials allowed scrutiny by archaeologists who preceded the fire-fighting bulldozers. Although preservation of cultural resources had been an ongoing theme in fires at places such as Mesa Verde, they had never received the attention directed at natural resource management during and in the aftermath of fires. This new level of engagement came about serendipitously. On his way to visit an archaeologist friend at the NPS regional office in Santa Fe, Regional Scientist Milford R. Fletcher, the head scientist for the NPS in the Southwest, looked up and saw the smoke of the La Mesa Fire. He told Cal Cummings, an NPS official responsible for cultural resources, that the situation demanded archaeologists ahead of the construction of fire lines. Archaeologists could locate buried sites and direct the bulldozers away from them, the always adamant Fletcher insisted. Cummings, Superintendent John D. Hunter of Bandelier, and Santa Fe National Forest Supervisor Cristobal Zamora agreed; Cummings found and scheduled volunteers, and Fletcher provided supervision. Nearly forty archaeologists worked in front of bulldozers during the La Mesa fire, establishing the primacy of cultural resource management even in a particularly dangerous fire.³¹

The fire promoted new cooperation and awareness, but there were tense moments. In one case, Fletcher turned off a USFS bulldozer, telling its driver: "We don't care if the trees burn. They'll grow back. Ruins won't." Although managers made every effort to let archaeologists record sites and guide fire fighters away from ruins during the initial

²⁹ Teralene Foxx, ed., *Los Alamos Fire Symposium, Los Alamos, New Mexico, October 6-7, 1981* (Los Alamos: Los Alamos National Laboratory, 1984), 3-6.

³⁰ John Lissoway interview, August 15, 2002.

³¹ Dr Milford R. Fletcher, conversation with the author, August 21, 1986; Senior Archeologist Cal Cummings to Chief Anthropologist, WASO, January 24, 1986, copies in possession of the author..

construction of fire lines, they often were not present during any subsequent widening. More than 40 percent of archaeological sites surveyed in the aftermath showed signs of damage. The remainder were unaffected, a measure of the success of the improvised program, and veterans of the fire remembered that shared objectives superseded occasional conflicts. After the fire, archaeology became one component of fire management in the Bandelier area.³²

La Mesa illustrated the changes in the National Park Service as a fire management organization. It showed that the success of fire management depended on an array of values to guide decisions. The NPS had modest credibility as a fire suppression organization prior to the change in policy reflected in the Green Book in 1968. The new policy changed weak suppression capabilities into a far-sighted approach to management. The NPS considered an overblown suppression organization an expensive liability. By La Mesa, other agencies, most notably the USFS, had begun efforts to rein in their fire programs and go in new directions. But as common as a weakened suppression organization became, it did not necessarily assure a strong overall fire management structure. Even as it pioneered fire management, the NPS was seen as strong in theory and rhetoric, but limited in its on-the-ground response. La Mesa illustrated this difficulty with some clarity.

The fire near Bandelier National Monument offered a test to the National Park Service, and the Service weathered it. Although the fire was neither prescribed nor natural – it was more typical of suppressed fires in that it resulted from human carelessness – it provided an important challenge to the policy of allowing some fires to burn. La Mesa further illustrated the shortcomings of suppression as a dominant strategy. It did more than all the press releases in the world to remind the public of the danger fire presented. During a major fire year in the West, with California already aflame, La Mesa was a smaller, specialized blaze that highlighted the NPS's concerns more clearly than it spoke to larger issues of fire management. La Mesa made the pronouncements of the value of fire sound hollow. The fire garnered publicity and threatened a community; suppression seemed the natural and the only response. It became a reality check for NPS fire managers.

In the aftermath of La Mesa, Bandelier National Monument developed a new fire management plan that took into account the lessons learned on the Pajarito Plateau. The long years of suppression had created a fuel load so heavy and so dry that it altered the composition of the soil beneath and the patterns of regeneration that followed the fire. The new fire plan responded to these realities, clearly recognizing that cyclic burning did more to bring the park closer to the ideal of a pristine environment than suppression and concomitant catastrophic fire. The objective of the Bandelier fire plan was to “where possible, re-establish the role of fire as a natural process necessary for the perpetuation of fire-dependent ecosystems.” The plan proposed prescribed burns for research purposes, keeping the plots small to keep smoke releases minimal. A rigid schedule of conditions under which fire was allowed was designed, coupled with a careful schedule for preparation of the land and protection of surrounding resources. Such a plan was far from

³² Dr. Milford R Fletcher, conversation with the author, August 21, 1986; Diane Traylor, “Effects of La Mesa Fire on Bandelier’s cultural resources,” in Foxx, *Los Alamos Symposium*, 97.

the model of suppression that characterized the plateau through much of the twentieth century.³³

La Mesa also altered the terrain in which fire and cultural resource management interacted. NPS-18 made suppression of fires that threatened cultural resources an objective of policy, complicating management at many parks with significant cultural resources. Fuel accumulation and stand density on 338,000 unsurveyed acres in Grand Canyon created a management problem. It served resource management purposes to let such areas burn if they ignited, yet NPS policy dictated that suppression was in order on land that had not been surveyed for cultural resources. The park faced the dilemma in 1981, seeking authority to allow natural fires within prescription conditions to burn, even if the area had not been surveyed for cultural resources as required under the amended National Historic Preservation Act.³⁴ Still, even after La Mesa, cultural resources remained a largely unexplored theme in the redefinition of the role of fire in national parks.

Highlighting the problems with prescribed natural fires – letting natural fires burn – the Ouzel fire at Rocky Mountain National Park even more clearly illustrated the gap between ideas about fire management and the realities on the ground. Ouzel began on August 9, 1978, and when National Park Service lookouts discovered the fire a few days later, park officials decided simply to monitor it. This decision was in accord with the park’s wildfire management plan, revised in 1977 after its initial adoption in 1973 and an earlier revision in 1974. The wildfire plan followed the dictates of the revised Green Book and NPS-18, creating a zone in which fire would be allowed to burn and detailing the conditions under which the NPS would monitor it. It also clearly stated that Rocky Mountain’s fire prevention program would “eliminate as completely as possible all man-caused fires,” accentuating the difference in response to various kinds of ignition. The 1977 plan defined three zones – low, moderate, and high risk – with different variables to mark them. In the low-risk zone, mostly above 10,000 feet in elevation, lightning fires were to be monitored and allowed to burn; in the moderate risk zone, below 10,000 feet in elevation but excluding developed zones, natural fires were allowed to burn when the National Fire Danger Rating System index remained under 14. In the high risks zone, which included the park’s developed areas, suppression remained the sole response to fire.³⁵

This complex method of response made good sense. By 1977, the National Park Service had developed a complicated vision of fire, combining a burgeoning respect for the value of fire with pragmatic objectives such as the protection of life and property. Even more, the National Park Service operated in the domain of public opinion. Even if allowing fire everywhere had been a desired goal, political and cultural constraints made such a strategy unwise at best. The Rocky Mountain National Park wildfire plan served

³³ Bandelier National Monument, “Interim Fire Management Plan for Bandelier National Monument,” August 8, 1980, Denver Service Center, Technical Information Center 315/D-76, 5-6. 22-23.

³⁴ Memorandum, Superintendent, Grand Canyon to Regional Director, Western Region, July 20, 1981, Grand Canyon National Park.

³⁵ Rocky Mountain National Park and Shadow Mountain National Recreation Area, Wildfire Fire Management Plan Part I – Fire Control, 1-2; Rocky Mountain National Park and Shadow Mountain National Recreation Area, Wildfire Fire Management Plan Part II Natural Fires, 1977, Denver Service Center, Technical Information Center, Denver, CO, D-201, 1-2.

as a model, a delicate but judicious attempt to balance the various forces pulling at NPS fire policy.

For more than a month, the National Park Service limited its response to the high-altitude Ouzel fire to monitoring, with park officials deciding daily whether the fire remained within management objectives. During most of the month, the fire remained within the low-risk zone defined in the fire management plan, the area above 10,000 feet in elevation largely composed of Engelmann spruce-subalpine fire forests below the timber line and of grasslands, meadows, and rock fields above it. Rocky Mountain occasionally introduced suppression tactics, but only to keep the fire within the designated low-risk zone. The ongoing effort to assure that the fire remained consistent with the objectives of park management taxed its resources, but largely avoided public rancor.³⁶ From a management perspective, Ouzel at this point seemed no worse than the Waterfalls Canyon fire, a public relations problem attached to the application of sound science to the question of fire.

The sense of a controllable problem changed as high winds swept the park on the afternoon of September 15 and again on September 16. They caused the fire to make substantial runs outside the management zone, threatening the town of Allenspark, Colorado, just beyond the park border. The NPS reacted too slowly to the wind change. At about 11:30 a.m. on September 15, Rocky Mountain staff predicted that the fire would escape into the moderate risk zone. This prospect triggered suppression activity, but before serious efforts could begin, the high winds created a crisis, putting the town in immediate danger. NPS and local response began in earnest, but it was not sufficient to halt the fire's spread. The town was saved by a fluke of geography. A small ridge deflected the chinook wind up and over the town, sparing it. As the fire spread, the National Park Service requested outside help. A Department of the Interior Class I fire team, the most highly trained specialists in the agency, from the Boise Interagency Fire Center headed to the scene. When the team arrived on September 16, professional suppression efforts began with new intensity. More than 600 people battled the fire. High winds dogged suppression efforts for two weeks, until on September 30, 1978, the fire was declared under control. It was finally extinguished on December 4, 1978.³⁷

Ouzel was the first time a prescribed natural fire had genuinely threatened a community. Waterfalls Canyon at Grand Teton in 1974 served as a precedent for the National Park Service, but because it was both slow-moving and far from the town of Jackson, its only direct impact was the unpleasantness of smoke. The people of Allenspark felt the real threat of a wildfire that had been permitted to continue to burn by a public agency. As was any such fire, Ouzel was a significant public relations and constituency problem for the National Park Service. It reprised an older split between national and local constituencies about the western environment. While *Time* magazine might espouse the NPS perspective on natural prescribed burning, as it had at Waterfalls Canyon in 1974, many people in north central Colorado perceived only a threat to their homes due to the irresponsibility of a federal agency. Persuading the public of the value

³⁶ Ibid., 2-4; Richard D. Laven, "Natural Fire Management in Rocky Mountain National Park: A Case Study of the Ouzel Fire," in *Conference on Scientific Research in the National Parks*, Proceedings of the Second Conference on Science in the National Parks (San Francisco, CA, Sept. 26-30, 1979), 37.

³⁷ Laven, "Natural Fire Management in Rocky Mountain National Park: A Case Study of the Ouzel Fire," 39-41.

of fire was a difficult task made worse when it threatened their homes. In a loud statement of the belief that federal fire management had failed, Boulder County actually fined Rocky Mountain for violation of local air quality statutes.

The Ouzel fire assaulted National Park Service management on two levels. It challenged the orderly structure the NPS developed to manage fire, illustrating what the emphasis on process seemed to overlook: that fire would not easily conform to administrative dictates. The NPS followed its fire management plan at Rocky Mountain; the results were not what officials intended. In addition, the Ouzel fire cost the NPS the trust of its neighbors at Rocky Mountain National Park, and by implication, the neighbors of any park where fire ran the risk of escaping its human monitors. To those outside the government, NPS policy seemed to place nature above people, a prospect that galled residents of the gateway communities that surround national park areas across the country. Earning back the confidence of local communities was crucial, but it would be an extremely difficult process for the National Park Service.

Pressure from the communities surrounding Rocky Mountain compelled the NPS to explain its choices and suggest new remedies and strategies even while the fire still burned. On October 3, 1978, days after the fire was declared under control, but well before it was extinguished, Superintendent Chester L. Brooks called for a board of review to investigate the fire. Kenneth Ashley, associate regional director for the Rocky Mountain Region, was selected as chair. Herman Ball, a fire management specialist from Region 2 of the Forest Service, Ron Gosnell, the Boulder County district forester for the Colorado State Forest Service, Richard D. Laven, assistant professor of forest fire ecology at Colorado State University, and Robert Sellers, an NPS fire specialist at the Boise Interagency Fire Center, comprised the committee. They received three charges: to assess the adequacy of Rocky Mountain's fire plan, especially its provisions for natural fire management; to determine whether the implementation of that plan was sufficient; and to review the park's suppression efforts once Ouzel was determined to be a wildfire.³⁸

With stunning candor, the review board offered an indictment of the application of existing policy. The park's wildfire management plan provided one target. The board found that deficiencies in the plan "may have conspired to prevent users of the plan from making proper decisions." The reviewers regarded the plan as a statement of philosophy, not an operational directive, exposing a glaring hole in NPS preparation. Rocky Mountain had an exemplary fire plan, written by David Butts, the future head of the Branch of Fire Management. The critique strongly suggested the need for internal rethinking of the park's fire management procedures and practices. The report pointed to a lack of information about the park's fire history, inadequate emphasis on external considerations such as air quality, adjoining development, and the increasingly urban character of surrounding lands as causative factors in the park's unfortunate situation. The three concerns encapsulated the history of NPS fire management issues: too few resources, too little scientific information, and a public that did not understand NPS objectives with regard to fire. The review pointed out that Rocky Mountain's plan did not "pinpoint responsibility for decision making," nor did it establish qualifications for personnel to

³⁸ Laven, "Natural Fire Management in Rocky Mountain National Park: A Case Study of the Ouzel Fire," 41; "Board of Review Report for the Ouzel Fire, Rocky Mountain National Park, Colorado, November 8-9, 1978," Glacier National Park, Fire Collection 1910-1984, 306-11.

implement the plan. Existing park planning did not contain available alternative measures to account for contingencies such as when fire exceeded a prescription, nor did it include a “precise and separate” action plan. Its criteria for prescriptions to manage natural fire were unclear and insufficient, the reviewers noted. Simply put, the park needed more than Burning Index guides. All in all, the report was an indictment of existing fire policy at Rocky Mountain National Park and the National Park Service.³⁹

Yet the policy at Rocky Mountain National Park in 1978 was more than typical of national park areas at the time. It reflected a stage in the evolution of the Service’s fire management, for it was more a philosophical statement than a way to actually implement fire management. The enthusiasm that NPS personnel showed after 1968 led to the rapid introduction of fire management objectives, sometimes without enough science or planning to adequately support their objectives. The situation at Rocky Mountain National Park was not unique; it could have happened at any of a number of parks. The problems reviewers found were by no means specific to the Front Range of the Rocky Mountains: they reflected the evolution of NPS fire policy to that time.

The board of review offered a number of ways to improve Rocky Mountain National Park’s response in future fire episodes. The report stated that the natural fire management plan should clearly describe contingencies under which suppression would become necessary, pointing to situations where resources were not sufficient to support the existing natural fire plan as a primary source of situations of confusion. The reviewers pointed to a tendency of park personnel to wait until after the fact to assess deficiencies, a strategy they regarded as detrimental to the planning process. Instead, the report insisted that the NPS needed to bring the best expertise to the planning process, not reserve it for the aftermath of fires. The development of better fire management units, more clearly delineated by fire history, vegetation types, fuel loading, elevation, and other factors would improve planning and encourage better decision making. The authors advocated considering prescribed fire – the intentional setting of fires – as an additional management tool for the park. More public comment was necessary, not only because of legislation such as the Resource Conservation and Recovery Act of 1976 (RCRA) that made public input a requirement but also because such interaction built support for NPS programs and created a constituency that would support the Service during difficult times.⁴⁰

The report also found fault with the implementation of the park’s plan. Although the board of review found that Rocky Mountain’s monitoring procedure met NPS standards and functioned well, implementing them proved to be a far more difficult task. Observations of the Ouzel fire were sporadic and incomplete, the review found, and park personnel lacked appropriate information. Spot weather forecasts were not requested in a consistent manner, and as a result, even though meteorologists anticipated the change in conditions, the park did not have sufficient warning about the conditions that erupted on September 15. Fire monitors had not always received clear and comprehensive instructions about their duties. The review board discovered that field notes were almost

³⁹ “Board of Review Report for the Ouzel Fire, Rocky Mountain National Park, Colorado, November 8-9, 1978,” Glacier National Park Archive, Fire 1910-1984, Box 306-11.

⁴⁰ “Board of Review Report for the Ouzel Fire, Rocky Mountain National Park, Colorado, November 8-9, 1978,” Glacier National Park, Fire Collection 1910-1984, 306-11; Resource Conservation and Recovery Act of 1976 42 USC 6962, October 21, 1976.

nonexistent; most monitors relayed information by the airwaves. Radio logs comprised the sole written record. “It appears to the Board that the opportunity to gather important data was lost,” the report sternly stated.⁴¹

The critique was harsh, but it articulated widespread problems in the NPS fire management process. Some observers saw the review as a face-saving gesture, an attempt to cover the inadequacies of policy by blaming the process of implementation. Yet such a charge was premature. At Ouzel, the NPS learned that letting fire burn was not necessarily an ecological and political solution to fire management issues. The fire illustrated the ways in which the National Park Service fire management apparatus had not yet reached maturity. The NPS fire management program remained idiosyncratic, subject to the predisposition of superintendents as well as being perennially short of the resources necessary for implementation. Again, the problems at Rocky Mountain National Park reflected the larger issues of the park system as a whole.

The reviewers constructed their own version of the path that took the Ouzel fire out of control. In this iteration, the blaze went beyond prescription boundaries on September 5, at which time the park’s fire committee opted to continue to let the fire burn. This declaration of culpability could easily be regarded as perfect hindsight, but as part of its after-the-fact assessment, the board pointed to a number of factors that contributed to its determination. One part of the fire dipped below 10,000 feet in elevation, entering the moderate risk zone, where fires were only allowed to burn if the Burning Index was below 14. The higher number of the index that day should have triggered suppression, the reviewers said. The organized local and regional fire response crews that should have been available to Rocky Mountain were busy at other fires, an absence that should have warned park leaders to be cautious. Spotting and crowning combined with the higher Burning Index to create erratic behavior, another trigger for suppression.

The review of the Ouzel fire pinpointed some of the most important problems associated with new strategies of fire management. First and foremost, funding was essential if parks were to achieve their management goals. One of the review board’s most significant criticisms was that Rocky Mountain’s plan, wholly adequate as a response to fire, was not appropriately implemented. Between the lines, the reviewers intimated that successful application of the management plan would have prevented the problems that arose. This assessment was simultaneously far-sighted and disingenuous. It accurately described a crucial issue that dated from the beginning of the National Park Service, the lack of adequate resources to meet obligations, even as it committed the fundamental and base error of treating wildfire as a bureaucratic category subject to the dictates of a management plan.

At about the same time, Congress added new holdings that transformed not only the national park system, but also its response to fire. As a result of the first serious attempt to adjudicate the land claims of Alaskan natives, the National Park Service acquired what in effect became another national park system in Alaska. The Alaska Native Claims Settlement Act of 1971 (ANCSA) allowed the Secretary of the Interior to set aside as much as 80 million acres of public land in Alaska for inclusion in federal land reservations. A seven-year dispute ensued, and when no resolution appeared likely prior

⁴¹ “Board of Review Report for the Ouzel Fire,” 306-11.

to the December 18, 1978 date on which withdrawn lands reverted to public domain, President Jimmy Carter proclaimed fifteen new national monuments and expanded two others under the terms of the Antiquities Act of 1906, eleven of which the NPS was slated to administer. Two years later, the staunchly anti-environmental Ronald Reagan won the 1980 presidential election. Before he took office, Congress offered the nation a lame-duck conservation gift, the Alaskan National Interest Lands Conservation Act (ANILCA). Under its terms, many of the national monuments established in 1978 became national parks or preserves, and the national park system gained more than 51 million acres in Alaska.⁴²

The new Alaskan parks presented an enormous challenge for fire managers. The acreage added in 1978 was significantly larger than the entire national park system in the lower forty-eight states and Hawaii. Although the NPS remained focused on the crown jewels of its system – Yellowstone, Yosemite, and their peers – the burned areas in Alaska and in Everglades National Park and Big Cypress National Preserve dwarfed the burned area in those premier parks. Fire response in Alaska compelled cooperation with federal, state, and Native Alaskan entities. The boreal forest burned in an episodic fashion, making it impossible to build up and maintain a large fire-response force year after year, simply waiting for the one that brought the big fire season.

Alaska reprised an earlier kind of fire landscape, one in which the nature of fire overwhelmed the human ability to respond. This reality, combined with the dictates of wilderness management – so fundamentally contrary to the ideals of suppression – encouraged the practice of allowing prescribed natural fire. Suppression had not been a characteristic feature of the Alaskan landscape as it had in the lower forty-eight states. Suppression in Alaska only really began with statehood in 1959, and developed in the late 1960s. This obviated many of the problems of heavy fuel load that so dogged parks with suppression histories. Even more, the size of the new parks guaranteed that fire would be a constant presence. Lightning fires far from human eyes were endemic in the new Alaskan parks. In most instances, these fires burned beyond the reach of park staff. When they were aware of such distant fires, they often lacked the resources to respond.

In Alaska, the Bureau of Land Management (BLM), the agency created from the 1946 merger of the Grazing Service and the General Land Office, served as the dominant federal land management agency. Prior to ANILCA, BLM holdings in Alaska comprised most of the state at more than 130 million acres. BLM was an unwieldy entity that included the Alaska Fire Control Service and it had a strong desire to compete with the Forest Service as the toughest of fire-fighting agencies. This basis for fire protection left the BLM to struggle in Alaska. Its bureaus and agencies were poorly prepared for managing the vast Alaska land mass. After 1949, BLM received special firefighting appropriations for its Alaska operations, allowing the agency to control its own fire suppression machinery. In turn, this began a process of nationalizing fire response in the

⁴² Hal K. Rothman, *Preserving Different Pasts: The American National Monuments* (Urbana: University of Illinois Press, 1989), 226-30; Donald Craig Mitchell, *Take My Land, Take My Life: The Story of Congress's Historic Settlement of Alaska Native Land Claims, 1960-1971* (Fairbanks: University of Alaska Press, 2001), 337-542; David S. Case, *Alaska Native and American Laws* (Fairbanks: University of Alaska Press, 1984), 14-20.

state. In the way that the NPS challenged USFS fire policy, the BLM challenged the mechanics of Forest Service fire response.⁴³

National park areas had been an important part of Alaskan history throughout the twentieth century, but the National Park Service rarely enjoyed the largesse of resources to devote to its far north assets. Only Mt. McKinley National Park, later re-designated Denali National Park, received substantial funding; other park areas, from Sitka National Monument to Glacier Bay National Monument, languished without comprehensive investment by the NPS. Many national park areas in the state were served by volunteer custodians; others were staffed on a seasonal basis.⁴⁴ This resulted in a glaring absence of NPS staff in Alaska long after the same condition had been resolved in the lower forty-eight states. The NPS needed peer agencies to help with its Alaska parks. Its relationship with the Bureau of Land Management (BLM) far exceeded any ties to the Forest Service throughout the 1950s, and as parallel entities in the same department, NPS and BLM found many areas in which to cooperate. BLM had the most highly developed fire response system on public lands in the nation's northernmost state, a direct product of its desire to show the firefighting world that it was as competent as the Forest Service. The National Park Service valued the support it received in the north.

The shift of lands to the National Park Service in 1978 did not include large sums for their management. Use of the Antiquities Act of 1906, the primary tool available to presidents for rapid protection of federal land, did not carry the power to allocate funds. Since the Jackson Hole proclamation in 1943, which led to a lawsuit against the U.S. government, presidents had been reticent about invoking the Act without prior congressional approval. A tacit agreement between the executive and legislative branches existed; presidents could proclaim any national monuments they wanted, but Congress only would fund the ones it approved in advance. The Carter-era national monument proclamations caught the National Park Service in a conundrum. While Service officials were pleased to have the new lands, they had to cobble together resources for their management.⁴⁵ The vast quantity of land included in the 1978 proclamations forced the NPS to extend its long pattern of reliance on the BLM in Alaska.

Under the provisions of the 1978 national monument proclamations, BLM provided protection for the lands the National Park Service managed. This delegation made sense to managers; the NPS received an enormous largesse, but in a fashion reminiscent of the early twentieth century, the resources to manage it were absent from the legislation. BLM's dominant role in Alaska made it the logical choice for short-term management. Its fire expertise, experience, and machinery were also a compelling asset. BLM had long provided fire suppression on NPS holdings in much of Alaska, and the NPS looked to the BLM in the aftermath of the 1978 proclamation.⁴⁶

⁴³ Pyne, *Fire in America: A Cultural History of Wildland and Rural Fire*, 308-09.

⁴⁴ Frank Norris, *Alaska Subsistence: A National Park Service Management History* (Anchorage: NPS, 2002), 46-161; Theodore Catton, *Land Reborn: A History of Administration and Visitor Use in Glacier Bay NP and Preserve* (Anchorage, AK: National Park Service, 1992), 173-90. 253-72.

⁴⁵ Rothman, *Preserving Different Pasts*, 230-31; Robert Righter, *Crucible for Conservation: The Creation of Grand Teton National Park* (Niwot, CO: Colorado Associated University Press, 1982), 103-25; William Everhart, *The National Park Service* (Boulder, CO: Westview Press, 1985).

⁴⁶ Cooperative Fire Control Agreement Between the Bureau of Land Management/Alaska and the National Park Service/Alaska, April 10, 1979, National Archives, Pacific Alaska Region, RG 79, Box 1, 79-01-A1103 File: A 40 ACGP Fire Management Committee, 1-2; Cooperative Fire Control Agreement

The new Alaskan national monuments required the NPS and BLM to redefine their management arrangements. Although the National Park Service had long relied on the BLM for fire protection in Alaska, the NPS operated under the aegis of NPS-18, while BLM retained an older suppression standard that only had been modified as a result of fires between 1970 and 1972. Yet the BLM remained uncomfortable with policies that encouraged the use of fire. As BLM fire specialist William Adams observed in 1974, the Bureau did not have a blueprint for coordinating such activities over the immense spaces of Alaska. Nor did Adams believe that BLM had enough research to develop a viable program. Observed Stephen Pyne, “BLM suppression strategy was challenged, its objectives redefined, and its land base eroded” in the 1970s. These realities led to a redefinition of BLM objectives. “Our philosophy has generally been to hit ‘em all, hard and fast, modifying on a fire-by-fire basis,” BLM State Associate Director Clair Whitlock explained in 1979. “Now we are coming up with protection standards for the whole area and parcels within it. Those standards will tell the fire men how and when to attack.” When the two agencies worked together, the NPS accepted the BLM protection standard on its new holdings. An NPS-designed modified suppression plan was given precedence over the general BLM protection standard on national park lands.

The BLM assumed responsibility for fire detection and suppression on NPS lands with the exception of Alaska Railroad and Parks Highway rights-of-way in Mt. McKinley National Park. BLM officials agreed to train NPS fire staff if space was available, to assist on NPS prescription burns if BLM was reimbursed for its costs, to undertake preliminary investigation of fires where human causes were suspected, and to provide a daily situation report. In return, the National Park Service promised to provide fire prevention programs for national park lands, to rehabilitate its own lands, to report all fires detected on NPS lands to the BLM district office, to collect fire weather data for the parks, and to identify lands that needed protection.⁴⁷

BLM’s growing position in fire management was an asset for the NPS that continued the ongoing transformation of the federal response to fire. It furthered the development of a strong Department of the Interior presence in fire management that countered the Department of Agriculture’s USFS. In 1978, a decade after the NPS initiated fire management and with an array of internal struggles over the question, the Forest Service finally embraced the use of fire as an ecological value. The 10 a.m. policy and the parallel 10-Acre policy were finally replaced with a program that promoted fire by prescription. By 1978, the revolution in fire practice was complete.⁴⁸ Not only had fire management replaced suppression in the Department of the Interior, the Forest Service, where the allegiance to suppression bordered on religion, had finally thrown in with the new approach.

The pressure for greater cooperation among federal agencies in Alaska grew, in part because the structure to support such a goal was already in place. The National Wildfire Coordinating Group, formed in 1973, provided an avenue for different agencies

Between National Park Service and Bureau of Land Management, Effective April 11, 1972, National Archives, Pacific Alaska Region, RG 79, Box 1, 79-01-A1103 National Archives, Pacific Alaska Region, RG 79, Box 1, 79-01-A1103.

⁴⁷ Ibid., 4; William Adams, “The Role of Fire in the Alaska Taiga: An Unsolved Problem;” “A Fresh Look at Fire,” News Release, Bureau of Land Management, April 3, 1979; Pyne, *Fire in America*, 509.

⁴⁸ Pyne, *Fire in America*, 303-04; William R. Moore, “From Fire Control to Fire Management,” *Western Wildlands* 13 (Summer 1974): 11-16.

to work together in a constructive fashion. The Boise Interagency Fire Center (BIFC) offered another avenue for cooperation. In 1978, federal agencies combined in an important experiment in Fortymile, a 12 million-acre section of east-central Alaska. A study team comprised of personnel from the National Park Service, BLM, Forest Service, U.S. Fish and Wildlife Service, Bureau of Indian Affairs, Alaska forestry and fish and game departments, and the Doyon Regional Corporation, an Alaskan Native corporation, assessed the many approaches to fire and assembled a fire management plan. The Fortymile effort was the first of its kind, a harbinger of greater cooperation in the lower forty-eight states as well as in Alaska. "If it can work here, where land plans are as complicated as anyplace in the United States, it can work anywhere," the BLM's Whitlock insisted. "And it will work. You'll see."⁴⁹

The Fortymile effort created the context for cooperation. David Kellyhouse of the Alaska Department of Fish and Game, the leading proponent of the value of fire for wildlife habitat in the state, championed the Fortymile project and proposed its use as pilot area for the development of revised management standards for Alaska. A dynamic program that paved the way for future management reform ensued. Even with the state's acceptance of the Fortymile project, the federal agencies had to learn to respect each other's policies and strategies. "I'm sure you appreciate our desire to avoid dividing individual [national] monuments into too many planning units," NPS Fire Management Officer William Paleck reminded Whitlock in September 1979. "We, in turn, appreciate the need to follow natural boundaries and maintain the integrity of fire zones within the state." By early October, the Fortymile fire plan was complete, and the Alaska Land Managers Cooperative Task Force selected two new areas, the Kenai Peninsula and Tanana-Minchumina, as candidates for the immediate development of fire management plans. An interagency public information program was planned as well.⁵⁰

The new relationship was not perfect, for the line between fire suppression and management often was hard to distinguish. Along this fulcrum, NPS and BLM's vision diverged and their philosophies contrasted in ways that the NPS found detrimental to its objectives. In 1980, Paleck notified the Fire Organization Working Group that the Service favored a single suppression support organization, but would retain control of fire management planning on NPS lands. David Butts of the Branch of Fire Management summarized the differences that prompted Paleck's plans. The BLM regarded fire suppression as something apart from resource management, a perspective that did not work for the NPS. National Park Service officials in Alaska saw fire management as a complete process that included prevention, presuppression, suppression, and prescribed fire, all in the service of larger resource management goals. By 1981, Butts saw BLM leaving the NPS out of the decision-making process, and he saw a "high potential for confusing or possibly even contradictory actions" by BLM. The difference between the two perspectives meant that the NPS had to accept direct management responsibility for a number of functions for which it had long relied on BLM. "The National Park Service will pursue a fire management program in Alaska that addresses the resource

⁴⁹ "A Fresh Look at Fire."

⁵⁰ David Kellyhouse, "Presentation to the Fire Management Subcommittee of the Alaska Land Manager's Cooperative Task Force, November 1978; William Paleck to Claire Whitlock, September 28, 1979, Alaska 6; Alaska Land Managers Cooperative Task Force, Fire Subcommittee Status Report, 10/2/79, Alaska 15.

management needs of its areas,” Butts said. “This in general will mean the development of prescribed fire management capabilities in those areas.”⁵¹

Alaska presented among the most demanding operational fire situations ever faced by the Service. As Butts predicted, the Service would have to handle prescribed natural fire alone. The amount of work was immense, the demand for resources insatiable, the possibilities frightening, and everything had to be decided immediately. In Alaska, “one of the fun things was the fact that we didn’t have time to think,” recalled John E. Cook, who served as director of the Alaska Area Office beginning in 1979 and became regional director on December 2, 1980, when the Alaskan national monuments became national parks and the Alaska Regional Office was created. Cook remained in the north until 1983.⁵²

Cook understood the pace of work and the need for dramatic and bold action. In 1980, before the 1982 agreement that solidified the relationship, the NPS had assumed responsibility for suppression on its Alaska lands from the BLM, but found itself unprepared for the responsibility. Under the arrangement, the BLM agreed to provide basic suppression services for the immediate future. The NPS was to provide the Land Manager’s Representative (LMR), which Cook described as the surrogate for the superintendent in fire situations. The fire boss of any specific blaze would report to the LMR. “This is an important step which can not be delayed due to the breadth and scope of the environmental and economic impacts of fire suppression within the State as well as changing agency roles and relationships in Alaska,” he informed other regional directors. “We need your help.”⁵³

Cook’s dilemma was simultaneously simple but insoluble. In Alaska, the NPS lacked enough people who could serve as LMRs in the case of a significant fire year. The BLM, already in transition as a result of the fire circumstances of Alaska, was generous in its willingness to support the NPS; Cook needed to be able to match its peer agency’s support with NPS resources. “I am asking the Regional Directors to assist us by providing the nomination of any qualified individuals for detail assignments as Land Manager’s Representative,” Cook beseeched his colleagues. “No one looks forward to the day when we in Alaska can supply as much assistance to other regions as we have received, more than I. Until then, I hope that you will continue to support high priority concerns such as this as graciously as you have in the past.”⁵⁴

With the debut of the BLM Level I draft plan in March 1981, the BLM emphasis shifted toward suppression on the newly designated Native lands. This change and the ongoing focus on suppression as NPS fire managers pursued different paths, limited BLM’s effectiveness for the broader-based NPS management policy. By October 1981, differences had overwhelmed the cooperative ethos and the relationship had crumbled over the wording of a BLM departmental manual. Each time NPS officials felt they had acceptable language, BLM offered further revisions. The situation has been “time

⁵¹ William Paleck, “Memo to Fire Organization Working Group,” February 8, 1980; “Briefing Statement: Fire Management, Area of Interest: Departmental,” February 19, 1981, David Butts, Issue: NPS/BLM Interaction on Fire, National Archives, Pacific Alaska Region, RG 79, Box 1, 79-01-A1103.

⁵² “A National Park Service Career: A Conversation with John E. Cook,” interviewed by Richard W. Sellars, January 11-12 and April 4, 2000, 63.

⁵³ Director, Alaska to Director, Rocky Mountain Regional Office, February 13, 1980, Yellowstone National Park Archives, Y-248, Yellowstone National Park.

⁵⁴ *Ibid.*; Pyne, *Fire In America*, 509-13.

consuming and frustrating on the part of both of these staffs,” Butts asserted. “The role of Alaska BLM to provide logistical support, retardant aircraft, smokejumpers, etc., is not challenged by us,” he continued. “But the Bureau of Land Management can not and is not in a position to provide monitoring of prescribed natural fires” that occurred on national park lands. The BLM had sought to prove it was as good at suppression and firefighting as the USFS, so it adopted a hardcore suppression approach based heavily on smokejumping. This did not last, but it complicated discussions between the two Interior agencies. The BLM behaved like the old USFS and Butts felt that the situation intruded on the authority of the National Park Service. If BLM handled fire suppression on Fish and Wildlife Service lands as well as on Native lands, the pressure on the NPS to allow suppression would be enormous. He proposed maintaining the ongoing suppression arrangement, but writing a revised “fire management program, which will be the primary tool in resource management for Alaskan natural area parks.” This translated into a different vision of policy: “The National Park Service does not intend duplicating BLM suppression capabilities or forces, but does intend to complement them in order to accomplish full spectrum fire management programs within the national parks.”⁵⁵ Different in its needs, the NPS decided it would have to go it alone – with all the responsibility that departure from the cooperation arrangement entailed.

Pressure from the highest levels of the Department of the Interior helped the National Park Service clarify its position and responsibilities. NPS Director Russell Dickenson strongly and successfully argued for an articulation of the difference in the Service’s mission. Dickenson persuaded Assistant Secretary of the Interior for Fish and Wildlife and Parks G. Ray Arnett to advance the NPS perspective. Arnett informed his counterpart, Assistant Secretary of the Interior for Land and Water Resources Garrey E. Carruthers that the Department of the Interior “should pursue a course of action that accommodates the necessary variation among the bureaus as long as they are not redundant.” During the Reagan administration, under Secretary of the Interior James Watt –who challenged conventional conservation at every opportunity and promised the press that he would “use the budget system to be the excuse to make major policy decisions” that strangled programs he did not like – this stance reflected a broader vision of the NPS mission than was typical among senior Department of the Interior officials at the time.⁵⁶

A new interagency agreement quickly resulted. A temporary secretarial order had been issued in December 1981, and the agencies formalized a new policy over the winter, before the summer fire season started. Under it, BLM’s role changed dramatically. It relinquished administrative responsibility for more than 200 million acres of Alaska, but retained its primary leadership role in fire suppression even as those lands turned over to the state of Alaska, Alaska Native corporations, and Department of the Interior agencies. The result was a forced compromise, essential to management of the far north. The NPS entered into the fire management program that became the “primary tool in resource

⁵⁵ “Briefing Statement: Alaska-Fire, Area of Interest: Departmental,” October 19, 1981, Background; National Park Service, Alaska Region, Issue Statement: Fire Management on National Park Service Lands in Alaska, October 22, 1981, National Archives, Pacific Alaska Region, RG 79, Box 1, 79-01-A1103.

⁵⁶ Memorandum, Assistant Secretary for Fish and Wildlife and Park to Assistant Secretary, Land and Water Resources, January 7, 1982, National Archives, Pacific Alaska Region, RG 79, Box 1, 79-01-A1103; Lance Gay, “Environmentalists Enlist Andrus in War Against Watt,” *Washington Star*, June 7, 1981, 3.

management for Alaskan natural area parks.” The BLM established the Alaska Interagency Fire Command in Fairbanks as the central fire response facility. This sole statewide fire suppression organization served as the “initial strike force against wildfires” on almost 300 million acres of Department of the Interior lands. The BLM’s arrangement with the NPS was formalized with a new interagency agreement in May 1982.⁵⁷ Even in an era when the Secretary of the Interior was an unabashed opponent of conservation, fire was too threatening and its management too important to be left in chaos to hew to the anti-federal line common in the Reagan administration.

The problem in Alaska was a reprise of an historic NPS condition. The combination of limited resources and vast acreage made complete suppression a tactical impossibility. It was as if Alaska in 1980 replicated 1920s conditions in the national parks. Suppression required full-out deployment of available resources and the Alaska office did not have enough at its disposal in the case of extreme circumstances. Suppression could be undertaken on BLM’s terms – when it was close to transportation corridors and population centers. The circumstances put Cook and the Alaska NPS office in the position of supplicants.

The NPS’s resources for fire suppression remained vastly limited in comparison with the BLM, and to earn credibility, the Service had to contribute to the national pool from which it drew so often. In 1981, the NPS Office of Fire Management announced a pilot program to create three crews to “assist all land managers with their fire problems.” Known as Arrowhead No. 1, No. 2, and No. 3, the crews were designed to meet the specifications for full-service Class I teams. The NPS crews were comprised of nineteen people, including a crew boss and three squad bosses. They were expected to provide support for the initial response of parks and to contribute the NPS’s share of the interagency fire crews.⁵⁸

This was the situation in which Brad Cella found himself when he arrived at Wrangell – St. Elias National Park in 1982. A veteran of Yosemite and the resource management training program so critical to developing resource management expertise in the NPS, Cella said he shook his head thinking, “I know they could have got someone better than me to be the first resource manager at the largest national park in the nation.” When he arrived, region/area wide fire planning in Alaska had just begun. William Paleck who had formerly been the regional fire management officer, had become chief ranger at the park. Cella was reporting to one of the most experienced fire management people in Alaska. Paleck “was willing to let me run with fire because he could watch what I was doing,” Cella recalled, and he became the National Park Service representative to the Copper Basin fire planning effort.⁵⁹

⁵⁷ National Park Service, Alaska Region, Issue Statement: Fire Management on National Park Service Lands in Alaska,” October 22, 1981; Bureau of Land Management Press Release, “BLM Establishes Interagency Firefighting Command in Fairbanks, Alaska,” January 22, 1982, National Archives, Pacific Alaska Region, RG 79, Y-14; “Interagency Fire Suppression Agreement between the Bureau of Land Management (Alaska) and the National Park Service (Alaska), May 19, 1982, National Archives, Pacific Alaska Region, RG 79, Box 1, 79-01-A1103.

⁵⁸ Memorandum, Chief, Fire Management to All Regional Directors, attn: Fire Coordinators, April 14, 1981, Glacier National Park, Fire Collection 1910-1984, 306-11.

⁵⁹ Brad Cella, interview by Hal Rothman, September 27, 2002.

Fire management in Alaska evolved into the most integrated and comprehensive interagency cooperation in federal land management. When representatives of the land management agencies sat down to discuss their options, each proposed its vision of the situation. Then the negotiations began. “The attempt was to try to ignore agency boundaries and look at the fire environment and look at the values to be protected,” Cella recalled. “I think the absolute key was that we talked about values, not each others values. I didn’t try to tell the Forest Service what was important to them or the BLM what was important to them. And they, by and large, didn’t try to tell me what was important to the National Park Service.” The negotiations focused on “how we could draw a line on a map,” Cella observed, “but it wasn’t over our values. I think it really kept us out of a lot of sticky stuff.”⁶⁰

The combination of agency programs and experience yielded significant results at all levels. The National Park Service became an important component of the Boise Interagency Fire Center, which became the National Interagency Fire Center (NIFC) in 1993. In no small part, the intensive cooperation that led to NIFC grew out of the cooperative experience of Alaska. Long a debtor to other federal agencies when it came to fire resources, the NPS became a significant contributor to interagency fire efforts. In 1986, the Service participated in 159 mutual aid dispatches, in which 28,761 acres of other agencies’ land burned. The NPS participated in the national mobilization of firefighters in August, 1986, the second year in a row that such action had been necessary. Five-hundred and twenty-eight NPS firefighters and staff personnel were dispatched to western fires, and engines from the Western Region and a helicopter from the Rocky Mountain Region contributed to suppression efforts. In Alaska, an NPS fixed-wing aircraft played an integral role in interagency suppression efforts. In turn, several NPS fires also required outside assistance. Five “project fires,” as such blazes were labeled, required 1,050 firefighters and staff from other agencies as well as the use of twenty aircraft. The NPS had a net gain in 1986. It received more help from other agencies than it provided even during the mobilization in August.⁶¹

Throughout the NPS, the goals of fire management were implemented in a systematic fashion. The change was palpable; from 224 acres in ten prescribed burns in 1977, the National Park Service engaged in 108 burns that covered 36,024 acres in 1986. Wildfires remained more random. 1981 and 1986 were brutal years, with fires covering 95,055 acres in 1981 and 119,976 acres in 1986, but they were aberrations. According to the NPS, a more typical year saw wildfires burning around 20,000 acres. More telling, 145 prescribed natural fires covered 75,491 acres in 1986, but this resulted in no small part from the increased fire throughout the park system that year. More typical was a prescribed natural fire total annual burn in the 20,000-acre range.⁶²

1986 also served as a harbinger of a more dangerous and difficult future. Around 1985, what has become a 20-year drought cycle began, interrupted by a wet period between 1989 and 1992. From the mid-1980s, federal agencies had to impose their policies against the pressure of the long drought. This confluence provided a partial explanation for why more has not happened. 1986 became the worst year in National

⁶⁰ Ibid.

⁶¹ Judi Zuckert, “National Park Service, Wildland Fire Report, 1986,” (Boise, ID: Branch of Fire Management, 1987), 1-2.

⁶² Ibid., 9-10.

Park Service fire history; the 195,467 acres that burned in wildfires and prescribed burns was the highest total in recorded NPS fire history up to that time. This total followed a difficult previous year, in which fires burned across more than 2.8 million acres of public land throughout the country.⁶³ Although the fire's impact on the National Park Service in 1985 had been muted, the overall trend and the increasing interdependency of interagency fire response gave NPS fire personnel concern about the future.

The following year was even worse. The 1987 fire season required the largest mobilization of personnel and resources to fight fire the history of the federal government. Every federal agency in the West contributed a higher level of resources than ever before. Nearly 2.5 million acres burned in 71,300 fires nationally. The NPS experienced a heavy year as well, with 704 wildfires suppressed after burning on almost 39,000 acres. Prescribed natural fires were also significant; 129 such fires burned 12,761 acres. The NPS continued its prescribed fire program as well, with 111 prescribed fires burning on 28,893 acres. During the first half of the year, fires in the Southeast and Southwest confronted the NPS, but the greatest demand on Service resources followed outbreaks of fire at the end of August. As California and Oregon burned – in one California fire, 580,000 acres burned in less than two weeks – the NPS contributed to interagency efforts. More NPS fire personnel assisted other agencies in 1987 than in any previous year. The Service dispatched more than 1,100 NPS firefighters to the West Coast blazes, also contributing to fire-fighting efforts in Washington and Idaho and taking all kinds of labor from their home parks. The system required trade-offs and had serious long-term costs.⁶⁴

The fires forced nearby national parks to respond with emergency measures. Near the worst of the Oregon fires in the Siskiyou National Forest, Oregon Caves National Monument readied evacuation plans; at Yosemite, during the Labor Day holiday, one of the busiest weekends of the year, the fires in the Stanislaus National Forest spread into the northwestern part of the park, threatening the Merced and Tuolumne groves of giant sequoias as well as nearby communities of Hodgdon Meadows, Crane Flat, and El Portal. The park closed roads and campgrounds as a precaution and some NPS employees were evacuated from the communities.⁶⁵ Such disruption was uncommon, but not unprecedented. It further underscored the ever-present threat of fire to the national park system.

Threats from fires outside national parks posed significant management problems at Sequoia and Kings Canyon, but in one major instance, earlier prescribed burning obviated what otherwise might have been dire consequences. The Pierce fire, which started on the Sequoia National Forest, showed extreme behavior, crowning and burning giant sequoias outside the park boundary. When it swept into the park, into a section of the Redwood Mountain grove, the scene of one of the first prescribed burning programs in the system, the reduced fuel load could not sustain the fire, and it was controlled with handlines. The park's sequoias were not damaged, solid evidence of the efficacy and long-term value of prescribed burn programs.⁶⁶

⁶³ Ibid., 1.

⁶⁴ Judi Zuckert, "National Park Service, Wildland Fire Report, 1987," (Boise, ID: Branch of Fire Management, 1988), 1-2.

⁶⁵ Ibid., 2.

⁶⁶ Ibid., 2.

The 1987 fire season further illustrated one of the ongoing problems of fire management. The transition to using fire to control fire had not happened quickly enough. Much of the land touched by fire had been subject to suppression for a long time, analysts recognized, creating the conditions that caused the worst fires. NPS fire personnel could take heart; the most severe and the most dangerous fires were not on NPS lands. It was easy to embrace the limited burning programs on NPS lands and point to them as proof of success of the theory of controlled burning. Yet, millions of acres that had been subjected to suppression remained adjacent to or near national park lands, dramatically increasing the threat to national park lands throughout the country. The three years of 1985, 1986, and 1987 suggested that the bill for suppression was coming due. In each successive year, fires worsened and managers viewed the situation with growing trepidation. From their perspective, the successes were small in scale, the threats enormous and growing. Even worse, the faith in prescribed burning and prescribed natural burning had not been matched by action, and NPS lands themselves contained millions of acres that had been subject to suppression for a long time and had not yet been reached by fire management efforts. While the tendency was to regard such lands as one of the consequences of the huge expansion of Alaskan national park lands, the problem was more widespread.

On another level, the fundamental fight was one of values. Once it understood the advantages of wilderness, the NPS was in a position to utilize the values of the growing wilderness and ecology movements as part of its intellectual rationale for the use of prescribed fire. This convergence granted a considerable grace period and created enough public goodwill to allow the NPS to experiment. The Forest Service lacked such leeway; its mission and history cast its objectives in a clear way. The public regarded the USFS more narrowly; once again the NPS's role as the preserver of American heritage allowed it the room to change while its peers were stymied. Yet the conundrum illustrated how the argument for a science-based solution was always about values and politics. When changes occurred often meant as much as what those changes were.

Another issue was the ever-growing gap between the ideas about fire management and the ability to implement them. The NPS had begun to solve resource problems with FIREPRO and other programs, and the interagency cooperation embodied in the National Interagency Fire Center provided a crucial assist. But theory and practical implementation remained far apart. In theory, with enough resources and an ideal political climate, fire managers could remove the threat of conflagration from national park lands. In reality, this faith was a dangerous proposition, an idea that while true, contributed to obscuring larger structural problems that dogged NPS fire management from top to bottom. The mechanisms that had been developed were state-of-the-art science, backed by clear and at their peak, sophisticated management programs. What they could not do was guarantee implementation of such plans, locate and deliver enough resources to control unruly fire when it occurred, and accurately predict where such fires would come from. Despite a decade of fire management, the process remained a hit-or-miss endeavor. The NPS had what it needed. It simply could not predict where the fire would come from or whether all of its resources would be enough to battle a substantial blaze.

By the late 1980s, a tremendous amount had been accomplished. The decade since the implementation of NPS-18 had been revolutionary. "Fire control," the

overarching philosophy of suppression for its own sake, had been eliminated, replaced with an infinitely more sophisticated balance of the use of fire, its introduction, and suppression. The NPS weathered disasters such as the Ouzel fire, which conversely strengthened management by leading to the establishment of the Branch of Fire Management. After all the confusion of a decade of transition, the NPS had much to its credit. It was becoming professional in fire management, and as the USFS continued to slide, it rose to the forefront among the federal agencies.

Yet the premises these changes hinged upon were subject to challenge by fire itself. The fantasy that fire was simple, and that planning, science, and organization could bring it to heel had been shattered in reality, but not yet accepted on the ground. The destruction of the ideal had begun at Ouzel, but the lesson did not take very well. The enthusiasm and vigor with which fire management had been born continued. The emphasis on science and planning, two important watchwords in the post-1960s National Park Service, made experienced professionals less cautious about the realities they knew than they could have been. Fire planning blossomed but, without a comprehensive review process, varied in quality. The best park fire plans were remarkable for their clarity and depth, their foresight and comprehensiveness. Others remained idiosyncratic; they strongly reflected local sensibilities but ran the risk of not comprehending, much less achieving national objectives. The successes of the decade – the interagency cooperation, a nomenclature change that reflected the growing interdependence of Department of the Interior agencies and their independence from the Forest Service – signaled notable transformations. They pointed to a new beginning, a step beyond the possibilities a mere decade before.

Fire management remained an uneven proposition in the NPS. Yosemite, Sequoia and Kings Canyon, Glacier, and Everglades led the way. Differences in management policy did not keep the new parks in Alaska from the forefront of interagency cooperation. Yet despite its long fire history, Yellowstone did not stand in the front rank of fire management planning. As the spring of 1988 approached, the nation's first national park had an approved fire plan that dated from 1972 and reflected the concerns of that era. This seemed innocuous, but it proved ominous, a portent of an explosion of nature and an implosion of policy that rocked the foundations on which fire management in the National Park Service rested.

Chapter 7:

Yellowstone and the Politics of Disaster

During the decade following the large, high-intensity Yellowstone fires of 1988, the National Park Service had to reinvent its approaches to fire and fire management. From the authorization of NPS-18 in the late 1970s, the NPS had faced fire as an operational assignment. Its responses reflected a powerful sense that the NPS could deploy resources in such a way as to make fire conform to management objectives. Professional fire planners and managers believed that by adhering to scientific principles derived from research, they could create a system that controlled fire and even turned it to the Service's advantage. The belief was reasonable, but it failed to take into account the unusual instance – the once-in-a-generation event that could not be planned for. The Yellowstone fires were that event: a giant fire in a place so important to Americans that it shattered the fire management program as it had been conceived, illustrating not only the boundaries inherent in the implementation of policy, but the fundamental impossibility that existing strategies could meet the challenge presented by large-scale, out-of-control fires.

In essence, major fires such as the ones that occurred at Yellowstone in 1988 transformed fire policy from a science-based response to a political issue. As long as fire remained a threat but did not present an immediate and insurmountable danger, scientists and park managers controlled the terms of debate. They could frame the underlying science in practical and abstract forms to buttress their arguments for policy implementation. Against such a carefully reasoned, science-based strategy, those who opposed NPS fire policy sounded shrill, unreasonable and self-interested. Under such circumstances, professionals had the upper hand, supported by the growing body of research that seemed to illustrate the value of fire management.

But the convergence of events in 1988 challenged the entire fire management model of the National Park Service as well as its administration of the parks themselves. In the summer of 1988, 1,427,902 acres in the Greater Yellowstone area burned during almost four months of fire. That total included 793,880 acres in Yellowstone itself, almost one-third of the park. When a November snowfall finally put an end to the blazes, the nation's first park, symbol for many of the country's relationship to nature and its wisdom in preserving even a small part of it, had burned uncontrollably. In that fire, the National Park Service found its image singed, its mantle as the most beloved federal agency seriously tarnished by the public's sense of betrayal over a circumstance beyond the Service's control. The mission of the National Park Service was to protect nature; the "devastation" that the public saw on television seemed to belie their trust.

There was nothing new about political grandstanding associated with the national parks, but the swirls around Yellowstone reached new heights. The symbolic power – the world's first national park in flames as seemingly ineffective firefighters and administrators responded with little success – provided powerful ammunition for outright assaults on the NPS and its programs. The fires and the inability to restrain them in any

meaningful way made the public question NPS fire management policy as it never had before. The resulting transition from science to politics was costly for the park system and for its managing agency.

**

During the summer of 1988, the event that the National Park Service long dreaded finally occurred. Following a difficult trio of fire years nationally, Yellowstone National Park, the pivotal symbol of the idea of national parks in the United States, burned out of control. That summer served as the NPS equivalent of the fires of 1910 for the Forest Service – the exception that proved the rule and that altered all that followed. The events at Yellowstone and the responses to them disrupted every institution in the Service, and indeed, in the federal government that dealt with fire, challenged existing knowledge and all the new ideas put in place since 1968, and threw fire management as a concept and a practice into unprecedented disarray. If the National Park Service earned its stature in fire management in the California parks, it found the limits of its knowledge, experience, and resource base at Yellowstone.

The NPS long had been the most beloved federal agency, providing park visitors with their most positive encounters with the face of national authority.¹ Fire management in general had caused some friction with the public, leading to diminishing loyalty to the Service in some quarters, but the public still generally beamed when it looked at the national parks, and it retained real fondness for the people who protected these treasures. The Yellowstone fires accelerated existing tensions and added new dimensions that led to outright condemnation of the NPS, its policies, and even individuals in the Service by the media and the public.

The summer of 1988 was the driest on record at Yellowstone National Park. Although the spring had been wet, with 155 percent of normal rainfall in April and 181 percent of normal amounts recorded in May, very little precipitation fell in the park during June, July, or August. Early in the summer, when Yellowstone was still wet, park staff elected to let about twenty lightning fires burn in accordance with policy. Each fire was evaluated on its own merits, the decision to monitor or suppress dependent on conditions.² As always, the fire situation demanded close scrutiny. As the summer progressed, conditions for fire to start and spread became common, and the National Park Service and every other land management agency in the region – at federal, state, or local levels – was prepared for the eventuality. NPS officials at the park and the regional office carefully monitored Yellowstone's situation, making decisions based on constantly changing circumstances.

In early June, the situation became threatening, but the risk appeared to fall within acceptable parameters. Fire managers had no reason to believe that any fires that occurred during the summer could not be controlled. Even though the region quickly dried out and rainfall appeared unlikely in the short term, the overall year had been wet to date and the

¹ Ronald A. Foresta, *America's National Parks and Their Keepers* (Washington, D.C.: Resources for the Future, 1984), 1-6.

² No author, "The Yellowstone Fires: A Primer on the 1988 Fire Season, October 1, 1988," Yellowstone Y-198, 6-7; Jim Carrier, *Season of Fire* (Salt Lake City: Gibbs Smith, 1989), 16; Rocky Barker, *Scorched Earth: How Fires in Yellowstone Changed America* (Washington, DC: Island Press, 2005), 185-87; David Carle, *Burning Questions: America's Fight with Nature's Fire* (Westport, CT: Praeger Press, 2001), 192; Douglas Gantenbein, *A Season of Fire: Four Months on the Firelines of the American West* (New York: Jeremy P. Tarcher/Penguin, 2003), 128-30.

weather pattern of recent years suggested that summer rainfall soon would follow. Fire managers had overcome very difficult summers in each of the three previous years, handling record levels of fire on federal lands in each successive summer. Confidence ran high among fire managers throughout the federal land management system; prescribed natural burning and prescribed burning had lowered fuel loads where implementation had taken place, and plans for more comprehensive introduction of fire permeated the National Park System. Interagency cooperation modeled on Alaska had taken root at the BIFC in Idaho, and programs such as FIREPRO in the NPS and equivalent programs in other agencies inspired a level of confidence in planning and deployment of fire resources that had not been possible a decade before. Yellowstone Superintendent Robert Barbee, who had come to the park in 1983 at the request of Director Russell Dickenson, was an old fire hand, with experience that dated back to the introduction of prescribed fire in the park system in 1968.³ Fire was always a tough opponent, but in 1988, most federal land managers believed that the tools they had to manage and combat it were equal to the task.

The Yellowstone region began to burn on June 14, when lightning started a fire in the Custer National Forest, north of Cooke City, Montana, the entrance in the northeastern corner of Yellowstone National Park. Called the Storm Creek fire, it began in Absaroka-Beartooth Wilderness and eventually spread over 95,000 acres. New fires continued to start, most induced by lightning. On June 23, lightning struck near Shoshone Lake, a remote area about ten miles from Grant Village. The initial blaze was small, about seventy acres. On June 25, another fire began in the northwestern corner of the park about thirty-one miles west of the north entrance. On July 1, yet another fire ignited east of Yellowstone's southern entrance. The fires multiplied, with new ones ignited on July 5 and July 9.⁴ A management nightmare for the National Park Service had begun. Natural fires proliferated, and the NPS had to make quick decisions.

The Service initially remained committed to its complicated mix of allowing some fires to burn, suppressing others, and in some cases, initiating prescribed burns in well-defined areas for management purposes. The more sophisticated programs that began in the 1980s had not yet been developed for the park and Yellowstone's fire plans remained rooted in the philosophical statements of the early 1970s. The park had begun to contemplate revisions, but had not progressed to the point of public review. In the spring of 1988, a plan that had been drafted three years before had not yet been sent through the approval process. It offered four objectives for fire management. It would permit as many lightning-started fires as possible to burn; protect human life and property, natural features, endangered species, and historic and cultural sites from damage or destruction; suppress wildfire in a safe and cost-effective fashion; and utilize prescribed burning to reduce fuel loads. Between 1972 and 1986, fires had burned across 34,175 acres in Yellowstone under the prescriptions that allowed natural fire. The largest single burn was about 7,400 acres. The largest natural burn in the park's history, at Heart Lake in 1931, had been only 18,000 acres. Given the scope and scale of NPS experience,

³ Robert Barbee, interview by Hal Rothman, Part I, November 12, 2004.

⁴ Ross W. Simpson, *The Fires of 1988: Yellowstone Park and Montana in Flames* (Helena, MT: American Geographic Publishing, 1989), 20-22; Carrier, *Season of Fire*, 11-17; Barker, *Scorched Earth*, 187-91.

the Service's actions when the fires started followed policy and reflected the predispositions of NPS experience with fire.⁵

Park managers viewed early fires in 1988 through the lens of recent experience. In the 1980s, Yellowstone experienced a series of abnormally wet summers. Only once between 1977 and 1987 did the park fail to achieve average July rainfall. In four of the five years beginning in 1983, the park experienced more than twice the average monthly rainfall for July. In 1987, the most anomalous year, Yellowstone received three times the annual average in July. With six consecutive years of above average rainfall in July, park managers and fire behavior specialists decided to continue established practice with what they defined as a natural prescribed fire, and simply monitor the lightning fires.⁶

But 1988 did not conform to recent history and eventually the shortfall of rain in June and July led to dangerous conditions. During June, the park recorded only 20 percent of the average rainfall for the month; July reached 79 percent of the monthly average. Moisture content in Yellowstone fell precipitously. By the end of July, fuel moisture levels in plants and tree branches were at astonishing lows. In grasses and small branches, moisture levels had dropped to as low as 2-3 percent, well beneath the 15 percent that signaled danger. Dead trees were measured at 7 percent moisture. NPS records showed that when timber was between 8-12 percent moisture, lightning served as an effective ignition for fires that burned freely. Even worse, unusually high winds associated with the dry fronts passing through the region spread any flames widely, much more than would have occurred as a result of the dryness alone.⁷

The result was a rapid change in policy that elevated suppression to the primary response in Yellowstone. On July 15, the park no longer allowed new natural fires to burn. When the decision was made, fires inside the park topped 8,600 acres. By July 21, fires covered 17,000 acres, prompting an even more aggressive response. As of that date, every fire in the park was to be fought, making suppression the singular objective of NPS policy at Yellowstone. An extensive interagency fire response effort began in mid-July. Experienced firefighters found that the combination of extreme weather and dense and dry fuel load posed conditions rarely encountered. Conventional firefighting techniques such as burning to create fuel breaks and backfiring proved ineffective. New fires started when winds blew embers from the tops of enormously high trees far ahead of the main fire – and almost always beyond a fuel break or a backfire – thwarting most efforts to contain the fires. Called spotting, this phenomenon made ineffectual even the widest of bulldozer lines. Fires started by spotting crossed the Grand Canyon of the Yellowstone River and routinely jumped roads and streams. As a result, the speed with which the fires moved was stunning. In many instances fires traveled between five and ten miles per day, with instances of a two-mile jump in one hour not uncommon. The tremendous heat generated by the huge fires contributed to their spread, for it let the fires consume even the heaviest of fuels that would not have been likely to burn in a more normal fire season. Everything about the Yellowstone fires seemed designed to demonstrate that fire could exceed human control.⁸

⁵ No author, "The Yellowstone Fires," 4-5; Robert Barbee interview, Part I, November 12, 2004; Stephen J. Pyne to Hal K. Rothman, August 8, 2004.

⁶ No author, "The Yellowstone Fires," 6-7; Robert Barbee interview, Part I, November 12, 2004.

⁷ *Ibid.*, 6; Simpson, *The Fires of 1988*, 21-23; Robert Barbee interview, Part I, November 12, 2004.

⁸ No author, "The Yellowstone Fires," 7-8.

Secretary of the Interior Donald Hodel toured the area on July 27, confirming suppression as the Service's primary objective in battling Yellowstone's fires and reminding everyone that the natural fire program had been suspended. The public and congressional representatives expected to see the results of suppression, to see fires extinguished, and to watch as the dramatic fires of 1988 came to an end. Such a result was simply beyond human capability. Firefighters could not attack the fires from the front, as spotting and the high winds made the risk too great to bear. Crews could be overrun or trapped between the spot fires out front and the main fire behind. As a result, firefighting took place from the flanks except when lives or property were in the direct path of an oncoming fire.⁹

Experienced firefighters were shocked at the fires' power and at the ineffectiveness of all responses. Even those with as many as twenty years in fire response had never seen anything like Yellowstone in 1988. Most agreed that the only solution to fires of this magnitude was help from the weather. Rain or snow could alleviate the condition, but no technology, strategy, or amount of labor could overcome the flames. "We threw everything at that fire from Day One," observed Denny Bungarz, a USFS incident commander from the Mendocino National Forest in California who served on the robust North Fork Fire. "We tried everything we knew of or could think of, and that fire kicked our ass from one end of the park to the other." Bungarz's sentiments reflected not only the magnitude of the problem, but the way in which this fire shattered expectations about fire management.

Throughout the grueling months of the fire, the commitment of fire crews and their professionalism exceeded even the highest expectations. Because of the pressure and danger in the work, crews turned over with great frequency. Superintendent Robert Barbee met with a "constant parade of fire commanders," and as he became comfortable with them, "they served their time, they cycled out, a new team came in, and you had to get used to them," he recalled. Barbee recalled the turnovers as a disruption to Yellowstone's ability to respond.¹⁰

"You got somebody, there was a guy named Dave Poncin who was an incident commander Type I, who was just beyond outstanding. So was his whole team," Barbee remembered. "When you lose somebody like that, you really feel the loss." Barbee felt the same toward Richard T. (Rick) Gale, who served as the unified area commander later in the fire. "He was a star in my opinion," Barbee recalled. "There is a guy who is smart, whose synapses fired cleanly, no carbon buildup. He did a wonderful job." The turnovers led to changes at about the time the working relationships coalesced. "Then you get a complete change and it is disruptive," Barbee insisted. "No question in my mind. Now, I don't know what you do about it, because you can't have those guys in harm's way all the time. They get [too] tired."¹¹ With mandated turnover in personnel, continuity was hard to achieve.

New fires continued to start across Yellowstone, with existing, separate fires joining together to create even more dangerous, powerful, and threatening conglomerates. By August 2, the Clover-Mist fire topped 73,754 acres as it spread into the heavily

⁹ Ibid., 8; Barker, *Scorched Earth*, 194-202; Simpson, *The Fires of 1988*, 22-24

¹⁰ No author, "The Yellowstone Fires, 8; Robert Barbee, interview by Hal K. Rothman, Part III, November 14, 2004; Carrier, *Summer of Fire*, 38.

¹¹ Robert Barbee interview, Part III, November 14, 2004.

timbered Shoshone National Forest. On August 10, the more than 20,000-acre Red Fire joined with the 25,200-acre Shoshone Fire. Burning in the southern end of the park, the Red Shoshone Fire grew rapidly, burning across another 10,000 acres over the next five days. Other fires continued to spread, with the Clover-Mist fire reaching 95,000 acres on August 14 and the North Fork Fire at 52,960 on the same day. August 20, called “Black Saturday,” set new records, with fires burning over 165,000 acres of timber, the highest daily total ever recorded at Yellowstone. “Giant mushroom clouds rose into the atmosphere,” observed reporter Rocky Barker, “making it seem like the park was under nuclear attack.” Silver Gate and Cooke City, two of the northeastern gateway communities to Yellowstone soon were in danger. The fire exploded in response to dry cold weather fronts that produced winds as high as sixty miles per hour. A backburn reduced fuel loads enough to keep the fire from the two towns, but the situation was serious enough that someone added a letter to the Cooke City sign and made the town “Cooked City.”¹² It was a fitting modification, given the difficulty of containing the blaze. Still, saving the two towns affirmed the confidence that had been the hallmark of interagency fire management.

The national policy response to the fires was rapid but symbolic. On August 23, 1988, in the midst of the Yellowstone fires, NPS Director William Penn Mott declared a freeze on all prescribed burns in the national park system.¹³ Mott’s decision was a throwback to an earlier era. The suppression order introduced at Yellowstone a month before became a system-wide standard for the first time in twenty years. While such a decision revealed elements of clear and precise after-the-fact decision-making, it also demonstrated a heightened sensitivity to public criticism of the Service and its practices. Even while firefighting efforts continued, the NPS had returned to trying to prove its worth as a scientific manager and as a steward of the public resources.

On September 7, high winds brought the North Fork Fire blaze to the Old Faithful complex, the first time fire had threatened the area in the 116-year history of the park. An aerial suppression assault attempted to slow the fire’s progress, but those efforts failed. Early in the morning, the National Park Service evacuated the complex. Between 500 and 600 people left by the 10 a.m. deadline, although visitors traveling by car still were allowed to visit the geyser as late as mid-afternoon, some arriving just minutes before the firestorm struck. The fire eventually encircled the Old Faithful area, and firefighters successfully battled to save the Old Faithful Inn as well as the electrical substation nearby. The fire burned so hot that it melted the rubber off the wheels of cars and a truck, shattered vehicle windshields, and scorched their paint. As many as nineteen buildings in the area burned to the ground, and the old dormitory building suffered damage. No one was hurt in defense of Old Faithful, although two deaths were associated with the North Fork Fire in the Greater Yellowstone Area.

The North Fork Fire was the classic fire that the National Park Service had always combated: a human-caused fire that resulted from the carelessness of individuals who used the woods for their own purposes. It began on July 22 in the Targhee National

¹² Simpson, *The Fires of 1988*, 20-21, 25-37; Carrier, *Season of Fire*, 54-68; Barker, *Scorched Earth*, 187-91; Carle, *Burning Questions*, 191-95.

¹³ Acting Director to Directorate, Field Directorate, WASO Division Chiefs, and Park Superintendents, Subject: Fire Management Policy Review Team, July 12, 1989, Yellowstone Y-198 “Coordination and Management Review: 1988 Fires,” Yellowstone National Park Archives.

Forest, managed by the USFS, the result of a cigarette dropped into dry leaves by one of four woodcutters who were taking a smoke break.¹⁴ The NPS and other agencies acted quickly to suppress the fire. But while the fire was typical of those the NPS and other federal agencies had aggressively battled over the years, the conditions under which it occurred were rare. Weather conditions, including high winds and a lack of precipitation, made the situation volatile. It was an ordinary event made extraordinary by its circumstances. The media could never quite grasp that critical piece of information.¹⁵ In the end, the North Fork Fire burned across more than 56,000 acres on September 7.¹⁶

The threat to Old Faithful Geyser highlighted a major public relations issue for the NPS. As the fire swept toward this potent symbol, it accentuated the inaccurate perception that the Service was ill-prepared to protect its resources. In turn, this contributed to further erosion of any sense that the NPS was special, an entity worthy of the public's affection. Even worse was the inaccurate presumption that the National Park Service stood by and intentionally permitted this beloved park to burn. Nothing could have been further from the truth.

Yet the park and its staff were rightly frightened by the spread of the fire and its spiral out of control. Chief Ranger Dan Sholly recalled that "not so many weeks ago, I thought the 4,700-acre fire sweeping toward the Calfee Creek cabin was a major blaze. What was it now? I looked at the fire summaries. It was the first one listed: Clover-Mist fire – 238,000 acres." Fire again proved more powerful than even the most professional planning and modeling, destroying all the assumptions specialists had made about its behavior. Park Ecologist Don Despain had played an instrumental role in designing Yellowstone's natural fire policy and earlier in the summer had predicted that the fires would grow no larger than 40,000 acres. As they approached 1 million acres, he evacuated his family from the park. Despain's research had been the standard on which most modeling had been based, and following his data, leading fire behaviorists predicted that any fire in Yellowstone would consume available fuel or be doused by rain before August ended.¹⁷ Once again, fire proved that its behavior defied prediction.

The Yellowstone fires were the worst in a year that saw brutal fires throughout the West and Alaska. More than 72,000 fires were reported on federal lands in twenty-two states – 299 of these were classified as major. This designation meant that more than 300 acres burned or Class I or Class II teams were dispatched. Ultimately, fire burned across more than 4.3 million acres, enhancing the sense of apocalypse that was widespread in summer and fall of 1988. NIFC dispatched more than 41,000 fire personnel, including 4,000 temporary firefighters, in response. Between the middle of July and late September, 35,000 people actively fought fires. Almost 6,000 soldiers were deployed. The bills for fighting these fires were staggering. The USFS spent \$384.3 million, while the Department of the Interior reported adding \$200 million to the total. The final count

¹⁴ Simpson, *The Fires of '88*, 24; Carle, *Burning Questions*, 191; Gantenbein, *A Season of Fire*, 129-30.

¹⁵ "Yellowstone in the News: What Went Wrong in the Fires of 1988?" *Yellowstone Science* 2 2 (Winter 1994), 9.

¹⁶ *Ibid.*, 8-9; National Park Service, "The Yellowstone Fires," 6-7; Barker, *Scorched Earth*, 2-8.

¹⁷ Dan R. Sholly with Steve M. Newman, *Guardians of Yellowstone: An Intimate Look at the Challenges of Protecting America's Foremost Wilderness Park* (New York: William Morrow and Company, 1991), 221-22; Barker, *Scorched Earth*, 203-10; Carrier, *Summer of Fire*, 42.

showed the federal government expended more than \$600 million fighting fires throughout the region in 1988.¹⁸

An assessment of the impact of the Yellowstone fires revealed stunning consequences for the park and its environs. Fires raged across more than 1.4 million acres in the Greater Yellowstone Area; funds in excess of \$120 million were spent on firefighting and management. Almost one-third of the burned acreage, 566,608 acres, was inside the Targhee, Custer, Gallatin, Bridger-Teton, and Shoshone national forests surrounding the park. The rest, slightly less than 1 million acres, was inside Yellowstone.¹⁹ This total, nearly 36 percent of the park's 2.2 million acres, represented the most visible evidence of the fire's power and the fundamental ineffectiveness of all human countermeasures.

The outcry about the NPS response started in August, well before the worst of the fires. The media became a constant presence at Yellowstone. "It was an incredible episode," Superintendent Robert Barbee remembered. "I kept waiting for Quadafi or somebody to do something outrageous, because we were the only game in town all summer long." The national spotlight focused on Yellowstone never wavered. "We had unbelievable media focus," Barbee recalled. "We were not really prepared for that kind of media triage," Barbee said in a candid assessment. "I got to the point where I was having press conferences with a whole room of media. Our Washington office was not all that equipped to deal with it. I don't think anybody is really. The media piece was no small part of the whole thing." Media coverage of the event was "superficial and stereotypical," observed Ohio State University Journalism Professor Conrad Smith, who studied the press response to the fire. He believed that urban reporters brought a set of preconceptions derived from city structure fires that colored their perception of the Yellowstone fires. The media's cameras shaped the view of the experiences of the Yellowstone fires, contributing to their political consequences.²⁰

Attempts to manage the fire took place in full view of the public. Barbee found himself at the center of a maelstrom. "I personally became a lightning rod," he grimaced." By August it was beginning "to take a bit of a toll on me," he recalled. His superiors "kept saying 'well gee, maybe we ought to let someone else come in, and let you take a breather'. And I said no. I argued strongly against that; it would have caused all sorts of problems." Barbee had become what he described as the agent provocateur, the focal point of animosity about the fires. "The worst thing that could have happened would have been for me to step back, and them to bring somebody else in, some other senior person to take over," he insisted. "It would have sent all kinds of bad signals." Abdication or removal both conveyed a sense that the park was admitting that it had done something wrong. As Barbee noted, it also placed some other unfortunate, less completely identified with the park, at the epicenter of an enormous maelstrom. Barbee believed strongly that as superintendent, he should weather the storm of anger and questioning that accompanied the fire.²¹

¹⁸ Facts Summary of 1988, October 14, 1988, Yellowstone National Park archives, K-112.

¹⁹ Ibid.

²⁰ Robert Barbee interview, Part III, November 14, 2004; Conrad Smith, *Media and Apocalypse: News Coverage of the Yellowstone Forest Fires, the Exxon Valdez Oil Spill, and the Loma Prieta Earthquake* (Westport, CT: Greenwood Publishing Company, 1992), 37-76; John Dodge, "Does National Media Coverage Represent the West Accurately?" *The Olympian*, December 15, 2002.

²¹ Ibid.

National Park Service Director William Penn Mott sought to help Barbee by explaining the NPS position and its mission. Almost three weeks after the NPS declared that it would suppress all fires in Yellowstone, Mott informed Senator Malcolm Wallop, R-Wyoming, of the Service's fire planning objectives. "The flexibility to suppress naturally ignited fires when conditions become extreme, or facilities and adjacent land are threatened is unequivocally part of our policy," Mott assured Wallop. He attributed the difficult fire situation at the time to a combination of high fuel loads and dry weather. "I am pleased to report that with the help of some 2,000-plus fire fighters and professional staff, all Yellowstone area fires are under control," Mott trumpeted a little prematurely on August 11. "Unless extreme weather, such as continuous high winds, occurs, we expect them to remain so."²²

This letter was identical to ones sent to the governors, U.S. senators, and congressional representatives from Wyoming, Montana, and Idaho. All three states relied on tourism and the dollars generated by Yellowstone National Park, giving each a particular vision of the NPS fire response. While Mott attempted to persuade each that there was "a positive and pragmatic side of the fires we see today," his argument fell on unsympathetic ears. No matter how he couched the fires – as a "rebirth" or a "renewal of the park ecosystems" – leaders of states that depended on visitors did not accept the Service's argument.²³ In their view, the fires were a short-term economic and ecological disaster. Their budgets depended on potential visitors, but they were watching Yellowstone burning every night on the evening news. Most tourists decided to travel somewhere else that summer, costing every state around Yellowstone enormous revenue. State leaders – and many others in the West and in the nation – sought to affix blame for what political leaders from surrounding states framed as a disastrous situation.

By early September, the cries against what was perceived as a defective NPS policy reached a crescendo. Even though the Service had reverted to suppression in mid-July, a collection of western congressmen and senators, mainly Republicans, approached President Ronald Reagan in protest. "We strongly feel the National Park Service policy of 'let it burn' is wrong, especially with the drought and weather conditions in the west," stated a petition by Representative Ron Marlenee of Montana that also was signed by Don Young of Alaska, Jim Hansen of Utah, Larry E. Craig of Idaho, Bob Dornan of California, and by Representative Byron L. Dorgan of North Dakota, the lone Democrat to sign. "Ask anyone from the area and they will tell you that this is the wrong time and the wrong year to let a fire burn. The National Park Service did not heed these signs or the advice from many sources of the gravity of this year's fire conditions," the petition charged. The representatives demanded a change in what they inaccurately perceived to be the NPS policy of allowing fires to burn.²⁴

This accusatory stance was consistent with the negative feelings such representatives held toward the NPS. Most were "Sagebrush Rebels" from the decade before, vocal proponents for the transfer of federal land to the states. Many had bought into the larger vision of the "Wise Use Movement," an appropriation of Gifford Pinchot's

²² William Penn Mott, Jr., to Sen. Malcolm Wallop, August 11, 1988, Yellowstone National Park, K-1112, L57(170), Yellowstone National Park archives. (YELL-II 57).

²³ Ibid.

²⁴ Petition to Ronald Reagan, September 7, 1988, Yellowstone K-112, Yellowstone National Park Archives (YELL-II 58).

language for the idea of the greatest good for the greatest number for the longest time. Despite a changing regional and world economy, a new and overwhelming emphasis on outdoor recreation and leisure that made the National Park Service even more important to their states, and the growing and progressively denser urbanism in every western state, the Sagebrush Rebels sought fewer restrictions on the uses of public land. These latter day states-rights activists resented federal agencies' stringent policies about grazing, timber cutting, and other forms of extractive economic endeavor. The NPS had become a particular focus of the property rights movement, with one of its gurus, an angry but articulate Ron Arnold, preposterously calling the NPS "an empire designed to eliminate all private property in the United States."²⁵ The fires perfectly fit an anti-federal agenda. Framed as the result of bureaucratic indecision and incompetence, they lent credence to the charges of the Sagebrush Rebels. With a sympathetic president in the White House, one who had proven himself hostile to the environmental movement and its goals not only through his actions, but as a result of his Cabinet-level appointments, Western congressmen attacking NPS policies counted on a friendly reception for their charges.

The NPS responded as powerfully as it could to what its staff perceived as an unjust and inaccurate set of charges. In a response to the Phase II Yellowstone Fire Report in early 1989, Superintendent Barbee offered the most direct counter to the specific charges that the NPS let prescribed fires continue to burn after the July 27, 1988 confirmation of Yellowstone's decision to reinstate suppression. Barbee insisted that the park consciously chose not to invest resources in stopping smaller fires that were in the path of larger ones if they did not threaten developed areas. Under suppression strategy, such fires fell into the "confine" category; Barbee wanted them classified as wildfires with no response taken rather than as prescribed natural fires. He told Regional Director Lorraine Mintzmeyer, "Strategically, it was decided by Area Command and agency administrators to assign all available suppression resources to those fires that posed threats to developed areas or neighboring national forest land." Even if resources had been available, Barbee assured her, "direct suppression would have made no sense and would not have been committed" to such fires. "I personally find the suggestion that Yellowstone was promoting or allowing "prescribed natural fire" throughout late July, August, and September incredulous," he concluded. "The Yellowstone staff wants, in the strongest possible terms, this misperception corrected."²⁶

There were supporters of the NPS, some from surprising quarters. In a powerful commentary in *Rod & Reel*, noted conservation writer Ted Williams supported NPS goals and objectives with his characteristic clear logic and incisive prose. "All the superstition about the Yellowstone fires has provided an opportunity for those who yearn to loot wild land," he told his audience. A trout advocate, he saw in the Yellowstone fires a renewing of trout habitat, a principle he extended to the rest of wild land. Yellowstone's environmental health was better as a result of the fires, Williams told his readers in a message many of them, schooled in the conventional idea that fire was hazard, surely

²⁵ David Helvarg, *The War Against the Greens: The 'Wise Use' Movement, the New Right, and Anti-Environmental Violence* (San Francisco: Sierra Club Books, 1994), 131; William Riebsame, Hannah Gosnell, and David Theobald, *Atlas of the New West: Portrait of a Changing Region* (New York: W. W. Norton, 1997), 103-11.

²⁶ Superintendent, Yellowstone National Park to Regional Director, Rocky Mountain Region, May 8, 1989, Yellowstone Y-198 "Phase II Evaluation."

found counterintuitive. He extended his argument to the NPS. “The federal government isn’t perfect,” he finished, “every now and then one of its agencies takes its mission seriously and proceeds with courage, intelligence, and foresight.” Williams’ nominee for that status in 1988 was the National Park Service.²⁷

Buoyed by such support, Director William Penn Mott appeared before a joint meeting of the U.S. House of Representatives Subcommittee on National Parks and Public Lands of the Committee on Interior and Insular Affairs and the Subcommittee on Forests, Family Farms, and Energy of the Committee on Agriculture on January 31, 1989 to explain how the fires occurred and how the NPS would change its response as a result. “We must re-examine the events which led up to these fires and the fires themselves to learn all we can from them,” Mott told the congressional representatives. “We can do better in similar situations in the future.” Mott outlined a program of recovery that focused on fire line rehabilitation, reconstruction of burned cabins, and other infrastructure replacement and repair for Yellowstone, Grand Teton, and Glacier. The efforts would pump \$23 million into the three parks over five years, in addition to \$9.1 million of emergency money for 1989. He intended to follow the recommendations of the interagency fire policy management review team comprised of members from both the departments of the Interior and Agriculture, which had recently delivered a draft report and was compiling the public comments that derived from it. The public review of the report began in February 1989, with a final report expected soon after. Mott pointed to other changes in Service policy and procedure that he said would help with the response to fire, standardize practices, and create clearer reporting and greater accountability.²⁸

Outside observers felt uneasy about both Mott’s remedies and the status of Yellowstone’s fire management program. Some believed the park had mistakenly ignored NPS-18, which incorporated the best institutional thinking about how to make fire management happen on the ground. In the eyes of some, managers at Yellowstone seemed to have determined that their park was different. Yellowstone refused even to characterize its forests in the same language that the rest of the fire community used, preferring to invent its own idiom for describing its resources. After the 1981 season, the National Park Service convened a committee to review the park fire program; it gently urged Yellowstone to join the rest of the park system. In 1985, the regional office arranged for an experienced fire planner to spend the summer at Yellowstone in the hope that a modern document might evolve. Although the planner closely followed NPS-18, the outcome was openly flawed because the park refused to allow any written prescriptions or decision triggers that would limit the park managers’ discretion and because it never submitted the revised document for public or even full agency review. Yellowstone’s plan remained a 1970s-style statement of philosophy, not the manual of operations that characterized 1980s fire plans throughout the rest of the system.

After the fires of 1988, some fire scholars made trenchant critiques of NPS policy. Professor Thomas Bonnicksen, head of the Department of Recreation and Parks at Texas A&M University and a student of Edward C. Stone, was particularly harsh.

“The tragic wildfires in Yellowstone National Park have marked 1988 as the year the national park and wilderness frontier came to a close.

²⁷ Ted Williams, “The Park Service and its Burn Policy,” *Rod & Reel* (March 1989), 19-22.

²⁸ Statement of William Penn Mott, Jr., Director, National Park Service, January 31, 1989, National Interagency Fire Center, Yellowstone Box 2, D-131, 6639, National Interagency Fire Center, Boise, ID.

Simply stated, shifting the responsibility or the blame to nature for the Yellowstone disaster is not an acceptable excuse. The [National] Park Service and the Forest Service are in control and they are solely responsible for their decisions. . . . The ‘great experiment’ was the last attempt by [National] Park Service purists to retain the fantasy of a wild untamed frontier in our national parks.”²⁹

This characterization of the NPS as the bastion of purists defied the reality of 1988. Since the 1916 inception of the Service, it had been pulled between the two different dimensions of its mandate – protection of natural resources and accommodation of the public, with accommodation the easy victor in most circumstances. Directors such as Conrad L. Wirth had been unabashed accommodators, and with Secretary of the Interior Donald P. Hodel following the prescription established by President Reagan’s first Secretary of the Interior James Watt, the idea that the NPS was going to let nature take its course was patently absurd. If fire policy had escaped the efforts of the Reagan-era Department of the Interior to accommodate visitors everywhere, it was only because the mantra of small government forced choices among programs.

While ideological and emotional, Bonnicksen’s comments reflected a particular strain of the post-fire critique of the NPS. Despite the fact that his characterization of the Yellowstone situation was demonstrably false, he insisted that “wildwest management techniques [such] as letting fires burn unchecked” would have to change. National park lands had been altered by nearly a full century of management, he said, and were not wild, no matter how they appeared to the public. According to Bonnicksen, the National “Park Service in particular [was] unwilling to accept the reality that national park and wilderness areas must be managed now and forever.”³⁰ Of course, the NPS had been managing its lands since its birth in 1916, and fire programs were always central to its efforts. Once again, the Service faced the problem of trying to explain a complicated situation in a manner that those who did not understand the basic premises of fire management could understand. That such an attack came from a fire scientist highlighted both the man’s ego and the difficulty of communicating a scientific program in an age when most simply did not understand the subject.

Bonnicksen clearly did not understand the constraints on the National Park Service. Quoting the Leopold report, Bonnicksen claimed the NPS did not recognize that park areas where suppression had been common might require “careful advance treatment” prior to the introduction of fire, although in reality the NPS had engaged in exactly that practice before every prescribed burn. In addition, at the most basic level, natural prescribed burns served almost precisely that advance treatment function for an agency that never had sufficient resources to implement a full-fledged program. Such a strategy was risky without a doubt, but it was the best available to the NPS.

Bonnicksen continued his tirade in *American Forests*, where in 1989 he published “Fire Gods and Federal Policy,” essentially a distillation of his earlier arguments. Management of national parks was possible and viable, Bonnicksen insisted, but the NPS relied “instead on Mother Nature and God. In the future, managing a Park or a Wilderness will only require that rangers stand on mountaintops making incantations to

²⁹ Thomas M. Bonnicksen, “Yellowstone Fire Information Update, Monday September 12, 1988,” Yellowstone K-112, (YELL-II 59).

³⁰ *Ibid.*, 2.

the Greek God Zeus. Who needs science when you believe that the gods are managing your forests?”³¹

The subject of brutal criticism, Yellowstone Superintendent Robert Barbee and a number of scientists fashioned their responses. As a natural resource specialist, Barbee had been one of the first fire managers at Yosemite more than two decades before, and he retained a powerful commitment to the principles of fire management. Excoriated during and after the Yellowstone fires, he was tagged with a nickname, “Barbee-Que Bob,” and faced considerable pressure to resign from the superintendency. “They had a big thing over there in West Yellowstone at one of the hotels, ‘Welcome to West Yellowstone and the Barbee-que,’” he remembered. In a tempered and measured response, Barbee defended NPS fire management and its goals, reiterated the value of science, and challenged Bonnicksen’s judgment, values, and even his competence. In scientific terms, Barbee and his co-authors wrote, Bonnicksen lacked the clear-eyed perspective necessary to evaluate the policies and actions of the NPS.³²

Barbee’s response pleased many within the National Park Service. But because Barbee argued in the terms of science, his response could only resolve part of the problem. Despite Bonnicksen’s peculiar attacks, few others believed the NPS departed from scientific models in its management. What they disputed was the fundamental policy, the idea that some fires should be allowed to burn even if – as it seemed after Yellowstone – NPS officials were not sure they could stop any blaze once it got started. This was a more mundane question, one that had little to do with either Bonnicksen or Barbee’s pointed response.

More temperate observers offered more substantive and powerful criticisms of NPS policies and actions at Yellowstone. In the estimation of Stephen J. Pyne, the park had unconscionably delayed developing a meaningful fire plan. Pyne found the lack of planning crucial. The park still operated under the terms of its 1972 fire management plan, one of the earliest in the system. “The 1972 document was a statement of philosophy, not a working plan,” Pyne insisted. Preceding NPS-18, it showed none of the influence of the new model. In the 1980s, when it seemed every park in the system worked on a fire plan with strong operational characteristics such as how to respond to different types of fires, Yellowstone seemed content to follow its earlier general model. Units as diverse as Pinnacles National Monument and Glacier National Park, a park that in many ways was the closest parallel to Yellowstone in the system, implemented sophisticated plans; Yellowstone did not. Barbee gracefully accepted this criticism: “The plan had been developed, but had not gone through the development process,” he admitted. “I think that probably it was taking a back seat to other resource issues.” Yellowstone had not been a problematic park for fire for a long time, and other pressures and concerns drew Barbee’s attention away. “Fire was out there, but not stage center,” Barbee concluded. “In fact, it was hardly making an appearance.”³³

³¹ Thomas Bonnicksen, “Fire Gods and Federal Policy,” *American Forests* (July/August 1989), 14-16.

³² Robert D. Barbee, Nathan L. Stephenson, David J. Parsons, and Howard T. Nichols, “Replies from the Fire Gods,” *American Forests* (March/April 1990), 34-5, 70; Robert Barbee interview, Part II, November 12, 2004.

³³ Stephen J. Pyne to Hal Rothman, August 8, 2004; Robert Barbee interview, Part I, November 12, 2004.

The reasons were clear. Between 1972 and 1988, fire simply had not been a major problem at Yellowstone. In that fifteen-year period, 235 lightning fires burned 34,000 acres in the park. Only fifteen such fires grew to more than 100 acres in size, and the largest was only 7,400 acres. The park's response had usually been swift and comprehensive. During 1979, the park experienced twenty-nine lightning fires, eleven of which were suppressed when they threatened facilities or property. Thirteen of the other eighteen lightning fires burned less than one acre. Even the most severe year, 1981, offered little reason to doubt the existing strategy. The fifty-seven lightning fires nearly equaled the highest annual total since the New Deal. Nor were they threatening in any meaningful way. That year, 20,240 acres burned, an area that comprised roughly one percent of the 2.2 million acre park.³⁴

Barbee faced a range of other issues between 1983 and 1988. The controversy over the Craighead brothers' research on grizzly bears continued, concerns about the removal of female bears attracted his attention, deferred maintenance issues loomed large, the NPS had recently purchased concession operations throughout the park, and as Barbee recalled, "grizzly bears, grizzly bears, grizzly bears, buffalo, buffalo, buffalo," dominated the park's horizons. In 1986, scientist Alston Chase published *Playing God in Yellowstone*, with its acerbic critique of park natural resource management, further pulling Barbee away from issues related to fire. Yellowstone was the most visible management post in the National Park Service and one of the most complicated. Barbee and both his predecessors and successors tended to focus on the hot issue of the moment. In the mid-1980s, that list contained everything but fire.³⁵

These and many other comments illustrated the degree to which the Yellowstone fires affected the public perception of the National Park Service. More than twenty years before, observers had pitied the NPS for its friends rather than its enemies.³⁶ Pulled between constituencies during those years, the Service had engaged in a political balancing act, throughout it all maintaining the affection of the general public. By the late 1980s, the Service sometimes could not tell the difference between its friends and its adversaries. After the constant media reports throughout the summer, no matter how wrong-headed, the presumption that the NPS did the right thing seemed to disappear.

Two commissions evaluated the Yellowstone fires, producing two very different kinds of reports. Comprised of ten people from the departments of Interior and Agriculture, the Interagency Fire Management Policy Review Team was established on September 28, 1988, to review national policies and their application to fire management in national parks and wilderness and to recommend responses to the problems of the 1988 season. The team quickly submitted a draft report to the secretaries of Interior and of Agriculture, delivering it on December 15, 1988. A two-month public comment period began on December 20, and on May 5, 1989, the team produced a final report that prompted the creation of new guidelines for NPS fire management. The objectives of the service's fire management program – reduction of fuel load, the use of fire as a tool to

³⁴ Robert E. Sellers and Donald G. Despain, "Fire Management in Yellowstone National Park," in *Proceedings of the Tall Timbers Fire Ecology Conference and Intermountain Fire Research Council and Land Management Symposium*. (Missoula, MT. Tallahassee, FL. Tall Timbers Research Station, 1976), 108; Barker, *Scorched Earth*, 168-73.

³⁵ Robert Barbee interview, Part I, November 12, 2004; Alston Chase, *Playing God in Yellowstone: The Destruction of America's First National Park* (Boston: Atlantic Monthly Press, 1986).

³⁶ Foresta, *America's National Parks and Their Keepers*, 8.

shape landscape and create a more historic ecosystem – were solid, it ruled. However, the report did find that the policies to reach such objectives required refinement and additional thinking and planning.

The Service had to reaffirm and strengthen its prescribed natural fire policies. The report reiterated Pyne’s observations: “many current fire management plans do not meet current policies. The prescriptions in them are inadequate and decision-making needs to be tightened,” the summary observed. Further review of the plans was essential. Better dissemination of information about natural prescribed fire was a necessity, the report said, adding better interagency planning as another goal. Of the existing fire models, Alaska provided the most successful example, but even its remarkable degree of cooperation could be improved. In particular, regional planning had to be created to allow for contingency planning in extreme circumstances. A region-wide fire emergency such as occurred in Yellowstone in 1988 drew suppression crews away from home base, leaving what the review team regarded as inadequate coverage of the home areas. Internal NPS communication needed to improve. Many Americans still believed the NPS let the Yellowstone fires burn to serve biological purposes, when the record showed that the NPS initiated total suppression in mid-July, a full week before woodcutters inadvertently started the North Fork fire that eventually swept through the Old Faithful complex.³⁷

New fire recommendations resulted from the review team’s work. On June 1, 1989, Secretary of the Interior Manuel Lujan, Jr., and Secretary of Agriculture Clayton Yeutter directed their agencies to suppress all natural fires in national parks and wilderness areas until fire management plans that conformed to new federal standards could be developed. In addition, all fires were to be classified as either prescribed fires or wildfires, with wildfires fought by appropriate suppression methods and personnel. The responsible line officer was required to certify daily that prescribed fires were within their prescription, and that resources to keep such fires within their prescription area during the next twenty-four hours were available. Other longer term recommendations were included. These decisions affected not only the NPS, but the Bureau of Land Management, the Fish and Wildlife Service, the Bureau of Indian Affairs, and the Forest Service.³⁸ The default of the pre-1968 era had returned with a vengeance, in no small part as a result of the recommendations of a team of professionals. While it was easy to impugn the motives of the commission and to chastise the secretaries of Interior and Agriculture for following politics rather than science, their decision to shut down natural prescribed fire made sense in the political climate that followed Yellowstone in 1988.

A second review panel, assembled by the Greater Yellowstone Coordinating Committee, brought together scientists with backgrounds in natural disturbances. Chaired by Norman Christensen of Duke University, who had led the earlier review of fire policy at Sequoia and Kings Canyon National Parks, the committee ranged freely among the many questions that surrounded the fire. “My group and my panel were given a wide mandate,” Christensen recalled. “We were sort of free to go where we wanted, and we

³⁷ U.S. Departments of Agriculture and the Interior, “Recommendations of the Fire Management Policy Review Team,” *Federal Register* 53 no. 244 (December 20, 1988), 51,196-51,205; “Interagency Final Report on Fire Management Policy, May 5, 1989,” in Lary Dilsaver, ed., *America’s National Park System: The Critical Documents* (Lanham, MD: Rowman and Littlefield, 1994), 418-19.

³⁸ Department of the Interior, “New U.S. Fire Recommendations Approved by Secretaries of Interior and Agriculture,” June 1, 1989, National Archives, Pacific Alaska Region, RG 79, Box 1, 79-01-A1103.

did, I think at times with a little bit of concern on the part of the Yellowstone staff people,” who feared an assault on themselves, their decisions, and their policies.³⁹

The science that underpinned the review process was never in question. Fire specialists such as William Romme, Dennis Knight, and Don Despain had established a historic basis for high-intensity crown fires in Yellowstone, allowing the panels to see the fires of 1988 as being part of a natural or even normal process of ecological change. This finding simultaneously provided a scientific rationale for the fires and obviated the debate about NPS policy. In effect, existing research answered a salient question about fire in general and the fires of 1988 in particular: it was appropriate in Yellowstone and it did belong in the park.⁴⁰ The importance of the research and the acceptance of its data set the terms of the discussion.

While the federal review team focused on government policy, the committee of scientists reiterated a commitment to nature. “The group was always mindful of being in a situation of not wanting to create a public sense that Yellowstone as an ecosystem was in great trouble, that great ecological harm had been done by the 1988 fire,” Christensen recalled. Members asserted the importance of fire as a force in maintaining a natural landscape, memorably insisting that the “only way to eliminate wildland fires is to eliminate wildlands.” Fire was an “essential component” in nature and its removal would alter ecosystems in so dramatic a fashion as to belie the idea of natural systems, the committee declared.⁴¹

The commission’s most compelling recommendations showed an inherent flaw in the structure of Yellowstone’s fire management. Christensen believed that a “widely shared naiveté of what it is to have a natural prescribed fire program” provided a practical flaw in planning that contributed to the Yellowstone situation. Scientists had believed that Yellowstone National Park was large enough to comprise its own ecosystem. “If you would have asked me prior to those fires if there was any place that we might allow nature to run its course, Yellowstone National Park might be the place to do it,” Christensen speculated. Fifteen years of research and management showed that fire played an important and critical role in the Yellowstone forest, particularly the high-elevation lodgepole pine. The experience with the prescribed fire program in the same time period, in Christensen’s view “suggested that the landscape could contain that activity.” Most fires in the park during the era in which prescribed burning and prescribed natural burning had been utilized were relatively small, resuscitating an earlier myth that Yellowstone did not have big fires. Later research showed that lodgepole pine experienced fire of the magnitude of 1988 about every 300 years, with the last identifiable episode taking place in a period of high winds and extended drought in the early 1700s. The prevailing climatic conditions during most of the twentieth century seemed conducive to fires burning for short periods in small areas and then extinguishing

³⁹ Norman Christensen, interview by Hal Rothman, Part II, August 17-18, 2004, 1.

⁴⁰ William H. Romme and Don G. Despain. “The Yellowstone Fires” *Scientific American* 261 (November 1989), 36-44; William H. Romme, “Fire and Landscape Diversity in Subalpine Forests of Yellowstone National Park. *Ecological Monographs* 1982 52(2): 199-221; William H. Romme and Dennis H. Knight, “Landscape Diversity: The Concept Applied to Yellowstone Park,” *BioScience* 1982 32(8): 664-669; William H. Romme and Don G. Despain, “Historical Perspective on the Yellowstone Fires of 1988,” *BioScience* 39(10) 1989: 695-699.

⁴¹ Norman Christensen interview, August 17-18, 2004, 1.

themselves. “So, the idea that you could do this was supported by the thirteen years of data up to that point,” Christensen indicated.⁴²

From the comfortable vantage point after the fires, it was “easy to diagnose in hindsight,” Christensen conceded, “but in retrospect there should have been a few things that caused us some alarm.” The rate of burning in the Yellowstone ecosystem was very slow. Based on the thirteen years of scientific research, it would have taken millennia for the Yellowstone plateau to undergo a complete fire cycle. “We did not have on that landscape in 1987 really, really old forests,” Christensen observed. “It is pretty clear that they had all experienced fire in the last hundreds of years. I suppose that that might have tipped us off that maybe the experience from 1972 to 1987 was not exactly typical, or was not giving us a complete picture.” But the management program for prescribed and natural prescribed fire had not been developed with this reality in mind. As a result, what Christensen called “shut-off criteria,” the terms under which the NPS would begin suppression of natural fires, were not clearly defined.⁴³

The lack of definition stemmed from the presumption that natural prescribed fire, those started by nature, was inherently good in a national park landscape. The only difference between natural prescribed fire and prescribed fire was supposed to be a matter of policy: when nature started the fire, one set of management precepts were invoked. The NPS did not accept ignitions that came from accidents or people in a natural prescribed fire program – a fire started from a tossed cigarette or a camp fire was automatically disqualified. Lightning fires met the qualifications, but once they began, they were subject to same rules as any other prescribed fire. All of the issues going into the development of a prescribed fire plan for a regular burn control unit would then come into play. “But in fact they did not,” Christensen observed. “What in actuality happened was that very qualified people would monitor these fires and on a day-to-day basis would change in their view whether or not they were burning within prescription.”⁴⁴

This method left fire control decisions in local hands, once a goal of NPS fire management policy, but one superseded with the approval of NPS-18. Effectively Yellowstone followed a policy from the 1970s as the rest of the Service moved toward a more integrated model. From the perspective of the Regional Office, this was not an optimal situation. In 1985, Pyne was hired to accomplish the task of updating Yellowstone’s plan. “Once I got the numbers,” he recalled, “it took about five minutes to prepare a legitimate step-up plan.”⁴⁵

Pyne’s presuppression work was a prelude to the Regional Office’s real goal for the park, a new fire management plan. Pyne was expected “to nudge Yellowstone into a genuine fire plan,” he recalled. “I spent ten weeks at the task and drafted a lengthy document along the lines of NPS-18,” but encountered resistance from park staff. The draft plan had two critical flaws. Although it accepted “prescribed natural fires” inside park boundaries, it listed no prescriptions. “None,” Pyne vehemently insisted. “The park simply would not allow anything that would limit its own discretion.” Nor did Yellowstone take the plan through formal review channels. In 1988, neither public

⁴² Ibid., 2-3; Romme and Despain, “Historical Perspective on the Yellowstone Fires of 1988,” 695-99.

⁴³ Norman Christensen interview, August 17-18, 2004, 3.

⁴⁴ Ibid., 4.

⁴⁵ Stephen J. Pyne to Hal K. Rothman, August 8, 2004, copy in possession of the author.

review, which was required under the National Environmental Policy Act and the Resource Conservation and Recovery Act of 1976, nor review by the NPS Branch of Fire Management had taken place. Nor did the park follow the plan. Instead, Pyne observed, Yellowstone “simply used the fact of the document to get everyone off their case.”⁴⁶

The park did not agree with or appreciate Pyne’s perspective. “I ended my tour with a presentation to the park fire committee and Superintendent [Robert] Barbee,” Pyne recalled. He argued for another scheme, circulated in a memo to the park and to the Branch of Fire Management. It called for a rechartering of the entire Yellowstone fire program, on the grounds that the existing structure couldn’t fight wildfires and was not suited to monitor prescribed natural fires. “The NPS was not happy. I was never invited back for another bout of planning,” he said. Barbee did not recall attending the meeting, but accepted the character of Pyne’s assessment, if not necessarily the specifics.⁴⁷ From Pyne’s point of view, Yellowstone actively resisted the implementation of NPS fire management objectives.

From a later vantage point, some Yellowstone staff members disputed Pyne’s account. His perspective was only one version, a fact he acknowledged at a later date. “There is no justification for my insisting that I and I alone am right,” Pyne admitted in 2004, a perspective roundly seconded by the people who experienced the fire at Yellowstone. According to noted Yellowstone historian Paul Schullery, “Pyne had a philosophical preference just as individual and forceful as the one held by the National Park Service managers and researchers in Yellowstone. It was just a different preference from those of park researchers.”⁴⁸ The difference in opinions illustrated the gulf in possible responses and the genesis of subsequent debates about future direction.

Christensen’s evaluation of the Yellowstone situation was more generous. “I sensed working with the staff, all of them from Superintendent Barbee on down, there remained a degree of defensiveness and paranoia about the program,” he remembered from the vantage point of fifteen years past the events in question. The park’s defensiveness was compounded by Yellowstone’s position as the first and premier national park in a varied and diverse system. Yellowstone staff believed that their issues were unique, and that models elsewhere in the park system were not necessarily relevant to their circumstances. The combination of “all of those things led to a kind of hubris in the staff,” Christensen believed, “if not certainly a defensiveness in the program.”⁴⁹ To managers at Yellowstone, maintaining their discretion and prerogative was a paramount value that affected the development of park fire management policy.

Yellowstone staff saw this issue from a very different perspective. “It was more basic than that,” one staffer recalled. “Park staff simply were tired – of breathing smoke, of answering hysterical phone calls and snide media questions, of being accused of ‘destroying’ the very place they lived and devoted their professional lives to—and by people who mostly were not there to see that, in the eyes of local beholders, that Yellowstone was not ‘gone.’ No one, from the superintendent down, was immune to that

⁴⁶ Ibid.

⁴⁷ Ibid.

⁴⁸ Stephen J. Pyne to Hal Rothman, December 18, 2004; Paul Schullery to Roberta D’Amico, October 13, 2004; Paul Schullery and Don G. Despain, “Prescribed Burning in Yellowstone National Park: A Doubtful Proposition,” *Western Wildlands* 15 2 (Summer 1989): 30-34.

⁴⁹ Norman Christensen interview, August 17-18, 2004.

personal defensiveness – which doesn't make it all wrong headed."⁵⁰ In the crosshairs of public and media expectation, in a situation they did not create, under assault for circumstances largely beyond their control, park personnel could be forgiven any measure of defensiveness that manifested itself.

The degree of discretion meant that Yellowstone local-level monitoring to regulate the response to fire continued without the benefit of reviewed processes and prescriptions. As a result, the monitoring program took precedence; individual fire managers made the decisions. "The crux of the issue is fires get bigger regardless of all other circumstances," Christensen observed. "They just become harder to put out because the amount of perimeter that you have to deal with increases geometrically as the fire increases in time and size. So, there was this other problem [of response], and the problem of coming up with an operational definition of what a natural prescribed fire would be." There was little basis for decisions about what was acceptable and what was not. The guidelines were not sufficiently substantive. "The hope had been that fire started by natural causes would simply be allowed to burn," Christensen remembered, but the lack of real definition of parameters made decisions about what would burn and what would be suppressed into arbitrary local ones. In "certain circumstances that might be natural," Christensen observed, "because of other risk factors you would put the fire out." The lack of clear definition simply left too much leeway in the process.⁵¹

"Knowing what I know now, what would I have done?" Barbee rhetorically queried in 2004. "I would have probably taken action on the Fan Fire; I would have snuffed out, if I could, the Clover-Mist fires. These were all lightning fires. We didn't have any [fires] that we started, and I don't think I would have done anything different on the North Fork at all." Barbee did not believe such actions would have significantly altered the results. "Had we taken action on all these things, full suppression, there is no question in my mind the configuration would have been somewhat different, but we would have had great fires in Yellowstone. No question about it." The conditions were simply too severe, he maintained. "When you get all those variables coming out on the stage, the single digit relative humidity, and the explosively dry fuels, and then choreographed by the wind, the wind, the wind, the wind. That wind was incredible that summer," he remembered. "There is nothing that can be done."⁵²

Barbee recognized that he had faced a conundrum, a set of forces not only beyond his control, but equally beyond those of any institution established to address fire management. "I would have argued that let's just pull back, let's stop this nonsense of trying to draw lines around everything, let's go in and button-up values at risk, utility corridors, neighboring ranches, that sort of thing and just let [the fire] go. Because it became pretty obvious that we built lines, put in lines, worked hard, and then there were spots two to three miles ahead that burned out of control. The effort was heroic," he concluded, "but it was of little consequence. The joke over in West Yellowstone was 'what is brown in the middle and black on both sides? A bulldozer line!'"⁵³

⁵⁰ Sue Consolo-Murphy, review comments, "National Park Service Wildland Fire History," December 5, 2004. Consolo-Murphy served as a resource management specialist at Yellowstone in 1988.

⁵¹ Norman Christensen interview, August 17-18, 2004.

⁵² Robert Barbee interview, Part III, November 14, 2004.

⁵³ Robert Barbee interview, Part II, November 12, 2004.

Christensen agreed with Barbee's assessment, but with a cautionary coda. He was convinced that policy changes would have had little effect on the course of events in 1988. From a larger climatic perspective, 1988 was a remarkable year. Huge fires burned across the U.S., not just in the Yellowstone basin. "That does not excuse us from these management issues," he cautioned. The fires might "have burned different[ly], they might have burned less. Who knows? From there we really focused our attention on the consequence side of things, and maybe on the future in terms of what this might mean in a revised fire management program."⁵⁴

Yellowstone proved that fire management was not only a scientific process, it was equally a political exercise. Although the relationship between the two dimensions of the fire was obvious, the peculiar nature of western fire management created the illusion of their separation. The scope and scale of the 1988 fires shattered the presumption that fire was a scientific issue managed by ecological precepts. Natural prescribed fires and natural fires were ecological applications of scientific principles, generally managed by intense advance preparation and other methods that kept them under control. As long as those fires stayed within their bounds, they did not rise to the level of national policy attention. But a human-caused fire of this scale, of precisely the kind against which Smokey Bear had long warned the public, took the science experiment and placed it on a national stage, subject to new levels of review. The scale of commentary was exactly what might have been expected out of a society in which everyone grappled for their fifteen minutes of fame. Although the NPS certainly deserved criticism at Yellowstone for the state of planning in 1988, the motivations that underpinned critiques of its performance had a great deal more to do with political positioning than with the events of the summer of 1988.

The result was a wholesale change in fire management practice, not only in the NPS but throughout the entire federal land management system. The greatest initial consequence was the effective end of prescribed natural fire and its replacement with greater emphasis on prescribed burning. Between 1983 and 1988, the National Park Service intentionally burned an annual average of 32,135 acres. In 1989, NPS-prescribed burns totaled 56,889 acres, indicative of rising emphasis on prescribed burning that continued into the 1990s. An average of 62,843 acres was burned under prescription between 1990 and 1994. The suppression order that followed the Yellowstone fires severely constrained the amount of prescribed natural fire. The acreage of prescribed natural fires decreased from 17,944 per year from 1983-1988 to an average of 3,708 acres between 1990 and 1994. Simply put, the risk of the consequences of an escaped natural fire so outweighed any ecological or scientific advantages that might be derived from it that any reasonable park or regional office administrator eschewed the option except under circumstances that could not be disputed.⁵⁵

At the same time, the NPS stepped up its strategic response to fire. In 1989, the acreage burned in national parks decreased by 82 percent while the number of fires in the park system diminished by less than 1 percent. A combination of more aggressive suppression and sheer good fortune accounted for the difference, but it was not clear that

⁵⁴ Norm Christensen interview, August 17-18, 2004.

⁵⁵ Judi Zuckert, *National Park Service Wildland Fire Report, 1989* (Boise, ID: Branch of Fire Management, 1990), 8; Rodney Norum, "Natural Fire Management in the National Park Service After 1988," *Renewable Resources Journal* 11 1 (1993): 18.

the change was a portent of either a more secure future or a more ecologically sound national park system. Wildfires continued in characteristic fashion, with the largest typically burning in Florida in the southeastern United States. In 1989, the year after Yellowstone, 135,494 acres burned in wildfires in the Southeast, more than 80 percent of the national park system total. Neither the prevalence of wildfires nor the 47,910 acres in prescribed burns in the Southeast excited much interest from the national press or anyone else still in an uproar about the Yellowstone fires the year before. The difference in activity, with only 10,240 acres burned in 287 wildfires and 4,993 acres in prescribed burns in the Western Region, suggested the full impact of the Yellowstone fires.⁵⁶ In effect, at least in the drier western United States, the National Park Service returned much closer to the suppression regime that had prevailed prior to 1968.

The pressure on the National Park Service to justify its fire policy did not abate. By May 1990, the NPS was preparing its final report on implementation of the changes recommended by the interagency fire management policy review team. In front of the House Subcommittee on Energy and Natural Resources, NPS Associate Director John Morehead conceded that “a much needed tightening” of policy and procedure was necessary and “perhaps could not have been accomplished without the impetus generated by the national attention” that stemmed from Yellowstone. Yet, Morehead insisted, the possibility to overreact was great. “We must exercise caution lest we move too far toward total suppression,” he reminded the subcommittee. “It is important to remember the role of fire in ecological dynamics and to ensure [that] our prescriptions maintain that natural role.”⁵⁷

Changes to prescribed burning led the implementation list. In the aftermath of the review team’s recommendations, NPS Special Directive 89-7, issued July 12, 1989, accepted the team report and ordered a complete review of NPS-18. The Service detailed a team of NPS field and regional fire experts to the National Interagency Fire Center in Boise to review the fire plans for each national park.⁵⁸ By that date, the NPS had been scrutinized completely; park- and Washington office-level officials had begun to rethink and revise policy and the Service had compiled a five-page list of corrective actions that were already under way. Most stringent was the continuation of a new suppression policy, introduced on June 1, 1989 that was to remain in force for national parks and wilderness areas until the Service judged the fire management plans for individual areas to be in compliance with the new federal recommendations.

Soon after, the Branch of Fire Management exercised the authority granted it under Special Directive 89-7 and offered new guidelines for policy. Finding “common management intent” with the Forest Service, the NPS developed new prescribed fire management guidelines. “A park may implement a prescribed natural fire program,” the new policy stated, “only if it has an approved fire management plan” that met the criteria established for prescribed natural fire; established contingency plans for personnel and

⁵⁶ Zuckert, *National Park Service Wildland Fire Report, 1989*, 11-12.

⁵⁷ “Statement of John M. Morehead, Associate Director, National Park Service, Department of the Interior, before the Subcommittee on Energy and Natural Resources, House Committee on Government Operations, on the implementation of the newly established fire management policy for federal land management agencies,” May 24, 1990, NIFC 39.

⁵⁸ Acting Director to Directorate, Field Directorate, WASO Division Chiefs, and Park Superintendents, Subject: Fire Management Policy Review Team, July 12, 1989, Yellowstone Y-14, Yellowstone National Park Archives.

material with cooperating entities; had an approved quantified defined prescription and monitoring procedures; detailed the availability of adequate fire management resources, and contained a process designed to outline and analyze management alternatives during a fire. This was a high standard, an effort to codify NPS fire procedures at a level never before attempted.⁵⁹

Yellowstone was subject to the most intense scrutiny in this process. One of the first to have its fire plan assessed, Yellowstone received concentrated review. The Branch of Fire Management determined that the unreviewed draft plan of 1987 did in fact sufficiently update the 1976 plan that had been the source of much consternation in the aftermath of the 1988 fire. It required some further consideration before it could be approved and any prescribed burning in the park could resume. These technical and procedural steps were crucial, as were other reforms in practice and procedure before the plan was ready for implementation. Acting NPS Fire Director Douglas D. Erskine was too circumspect to point out that the lack of implementation was exactly what critics focused on in the Yellowstone debacle in 1988. Work on a new plan continued, with a scoping statement under public review in August and September 1990 and ongoing internal critiques. The Yellowstone plan final debuted in June 1991, with questions about its practices and procedures continuing.⁶⁰

Prescribed burning at Yellowstone remained a controversial topic. Even some quarters in the NPS derided its prospects. Don G. Despain, one of the leading fire researchers at the park, called prescribed burning at Yellowstone “a doubtful proposition.” Prescribed burning could not be “justified as ecologically necessary in most of the park,” he concluded in a piece co-authored with Historian Paul Schullery. “Even an aggressive program of prescribed burning launched many years ago would not have significantly reduced the acreage burned in and near Yellowstone in 1988. . . . Yellowstone’s only real problem with fire is that once, every century or two, fire conditions allow more fires to burn than humans would like.” Others at the park echoed such sentiments. “No plan would have altered what happened in 1998,” observed Yellowstone Chief of Research John Varley, “and no plan will change what will happen in the future.”⁶¹

Critics might charge that such commentary was part of an elaborate National Park Service effort to shift the culpability for the fire away from the Service, but Despain, Schullery and Varley accentuated an important and easily overlooked part of the discussion. The 1988 fires begged the question of management, a fact that NPS officials pointed out over and over again to no avail. History showed that the Yellowstone environment burned at fairly regular intervals. From this perspective, it was human tolerance for such episodes that caused the uproar. Such a perspective might be scientifically accurate, but it

⁵⁹ Director to Directorate, Field Directorate, WASO Division Chiefs, and Park Superintendents, January 27, 1990, Revised, Wildland Fire Management, NPS-18 Prescribed Fire, 12-40, January 1990.

⁶⁰ Acting NPS Fire Director, BIFC to Regional Director, Rocky Mountain Region, Attention: Fire Coordinator, May 9, 1989, Yellowstone Y-198 “Review of Fire Management Plan;” Richard H. Bahr, Assistant Fire Management Officer to Bob Barbee, Superintendent, November 13, 1991, Yellowstone Y-14, Yellowstone National Park Archives; “Yellowstone National Park Wildfire Management Plan, June 1991,” (Yellowstone: Yellowstone National Park, 1991).

⁶¹ Schullery and Despain, “Prescribed Burning in Yellowstone: A Doubtful Proposition,” 30-34; John Varley, “The Status of Yellowstone’s New Fire Plan,” *Renewable Resources Journal*, Spring 1993: 20-21.

did not mesh well with the political realities of western land, resource extraction, dependence on tourism, and fire management.

The fires also highlighted a different dilemma for the National Park Service. It wanted to use science to benefit ecosystems, but politicians operated in another arena, with very different goals. Western politicians used the fires as backdrops for their various complaints about federal power and action. During the peak of the fire, Democratic presidential candidate Michael Dukakis came to Yellowstone. He arrived with more than 200 media in tow, and Yellowstone had a “big thing out there at Madison Junction.” Barbee remembered. “I asked him, ‘what do you want here, what are you trying to do? What do you expect from me?’ He said: ‘I don’t want to give you a bad time.’” Barbee responded: “I appreciate that.” Dukakis continued: “I will be honest with you. This is the only game in town. This is where the action is and I want some visibility and that is why I am here. I want to demonstrate my concern for the West.” While Dukakis did the park no damage, his visit illustrated the difference between science and politics. “Politicians want to run things from their own perspective,” observed long-time Yellowstone staff member Lee Whittlesey, “and often without regard for science, and the NPS has to listen to politicians.” Most politicians neither appreciated nor understood the role of fire in an ecosystem and “that made the (NPS) task more difficult,” Whittlesey concluded.⁶²

Bruce Kilgore, by then chief of the Division of Natural Resources and Research for the NPS’s Western Region, observed that “everyone realizes [that] there are limitations to what any fire management program can accomplish when extremely dry and windy conditions occur in forests with the heavy fuel loads found in Yellowstone and similar forest types in 1988.”⁶³ While Kilgore appreciated the impetus for policy rethinking that the situation provided, he stated what everyone close to fire management recognized: catastrophic fire was not subject to policy constraints. Any program of management faced circumstances in which its planning, resource allocation, and procedure would be inaccurate and insufficient. Yellowstone in 1988 had been one such instance. Making policy from such an unusual circumstance was a risky proposition, but one that federal fire managers had no choice but to embrace.

By the time Morehead addressed the subcommittee nearly a year later, a new prescribed burning program had been approved for a one-year test implementation period. The revision of NPS-18 also carefully defined the prescriptions under which natural prescribed fires would be allowed to burn. In the aftermath of Yellowstone, all prescribed natural fire programs had been suspended. The plans at the twenty-six parks with active natural prescribed fire programs were reviewed and revised to assure that they complied with the recommendations of both the review team and the commission headed by Norman Christensen as well as the new NPS-18 guidelines. When Morehead addressed the subcommittee, three parks – Yosemite, Sequoia and Kings Canyon, and Voyageurs – had met all the requirements and were in the process of reinstating their programs. The remaining parks were expected to follow the same process.⁶⁴ The parks

⁶² Robert Barbee interview, Part II, November 14, 2004; Lee Whittlesey to Roberta D’Amico, email of November 22, 2004, provided to the author.

⁶³ Bruce M. Kilgore, “Review Team Finds Fire Policy Sound But ‘Application Needs Changing,’” Yellowstone Vertical File, n.d ca. 1989.

⁶⁴ “Statement of John M. Morehead, Associate Director, National Park Service, Department of the Interior, before the Subcommittee on Energy and Natural Resources, House Committee on Government

were charged with strengthening fire management plans and improving command and control structures. Each would develop a comprehensive set of criteria to govern the conditions under which natural ignition fires would be allowed to burn and were expected to achieve significant progress in establishing regional and national contingency plans as well as procedures for curtailing prescribed fire if necessary.⁶⁵

The acreage that burned in 1990 reflected the new strategies. Wildfires in the NPS Western Region were prevalent, with 245 fires burning across 17,732 acres during a summer when more than 225,000 acres in California burned during August alone. In contrast, 135 fires in the Southeast Region burned on 23,341 acres, accentuating the ways in which the issues of the post-Yellowstone era were largely in the West. Prescribed burns illustrated the ongoing caution. The program proceeded tentatively and as the fire year worsened, the Service brought its prescribed fire program to a halt. "At this time," Acting NPS Fire Director Richard T. Gale told his regional and park staff on June 29, 1990, "all fire management officers should reconsider any and all prescribed burn plans, giving special attention to the limits on prescriptions that could pose control problems." The care that Gale encouraged was reflected in the program's execution. The forty-one such burns in the Western Region burned 2,026 acres, a minuscule total compared to the pre-1988 efforts. Comparison with the Southeast Region provided stark relief. The thirty prescribed fires in the Southeast, largely in Big Cypress National Preserve and Everglades National Park, burned 70,396 acres. By 1992, 111 small fires in thirteen national parks comprise the prescribed natural fire total in the park system. Ninety-five percent of the acreage burned came from Sequoia and Kings Canyon and Yosemite national parks, where experiments in prescribed burning started almost twenty-five years before. Only seventeen of the twenty-six parks that had a prescribed burning program before 1988 had reinstated it by 1992.⁶⁶

In the end, one consequence of the Yellowstone fires was a less aggressive approach to prescribed natural fire in the NPS. "The revised management policies," Kilgore observed, "appear to have toned down the apparent substantial commitment to allowing natural fires to burn whenever possible."⁶⁷ Kilgore's observation reflected the dismay current among specialists who administered fire at the grassroots who were forced to abide by the post-1988 rules. For many in the fire management structure, it was hard to see the change in goals as an advancement of NPS principles. The default to suppression flew in the face of twenty years of experience.

The greatest challenge to the renewed ethic of suppression took place in Alaska. After a number of unusual years in which the Alaskan parks experienced little or no fire,

Operations, on the implementation of the newly established fire management policy for federal land management agencies," May 24, 1990, NIFC 3, 3-4.

⁶⁵ Ibid., 3; U.S. Departments of Agriculture and the Interior, "Recommendations of the Fire Management Policy Review Team."

⁶⁶ Dean Berg, National Park Service Wildland Fire Report, 1990 (Boise, ID: Branch of Fire Management, 1991), 12-13; NPS Western Region, "Yosemite Fires, 1990," (San Francisco: National Park Service, 1991), 1-7; Acting NPS Fire Director, BIFC to All National Park Service Regional and Park Fire Management Officers, Jun 29, 1990, Y14 (Fire), National Interagency Fire Center; Bruce M. Kilgore and Tom Nichols, "National Park Service Fire Policies and Programs," in James K. Brown, Robert W. Mutch, Charles W. Spoon, and Ronald H. Wakimoto, "Proceedings: Symposium on Fire in Wilderness and Park Management," (Missoula: USDA Forest Service, General Technical Report, INT-GTR-320, 1995), 24-27.

⁶⁷ Kilgore and Nichols, "National Park Service Fire Policies and Programs," 24.

blazes returned in 1990. Two years earlier, when fires were rife in the interior Rocky Mountain West, only 303 acres burned in the Alaskan parks. In 1989, only twenty-eight acres burned. Since Alaska did not routinely engage in any prescribed burning, it remained almost entirely free of fire during 1988, the worst fire year in national park history. Nor did the massive prescriptive changes have any immediate affect. The rules of cooperation from the early 1980s persisted until 1990. That year, seven large fires in Alaska burned more than 108,722 acres, hardly a record in the nation's northernmost state, but a harbinger of management issues that challenged the NPS's vision of what it could do with fire in the far north and elsewhere. When the total acres burned in Alaska in 1991 reached 86,651, the NPS was forced to address the substantial differences between the forty-ninth state and the situation in the western part of the lower forty-eight.⁶⁸

The Alaskan response to the review team's recommendations had been outrage. Both state and federal land management agencies had recognized the efficacy of natural prescribed fire and were committed to its continued use. NPS officials could say little after the public outcry around the Yellowstone fires, but state officials loudly highlighted the differences between the lower forty-eight and the north. "The state of Alaska takes objection to the review team's recommendation that it is 'unprofessional and impractical for fires to be allowed to burn free of prescriptions or appropriate suppression action,'" the official response of the Division of Forestry of the Alaska Department of Natural Resource intoned. "We must express that there are regional differences across the nation in natural resource management goals and natural fire regimes. Alaska is a fire dependent ecosystem. There are vast areas of Alaska where fire does not pose a threat to people, property, or valued resources. In these places, fire is viewed as a natural event." Alaska State Forester M.R. "Bob" Dick, Jr., asked NPS Regional Director Boyd Evison to "carefully review any change in national fire policy that would compromise the ability of Alaska-based federal agencies to continue with current fire management plan arrangements. Put bluntly," Dick concluded, "if it ain't broke, don't fix it."⁶⁹

Dick's trenchant observations illustrated that the NPS grappled with wildland fire in two and even possibly three dramatically different situations. Alaska shared many parallels with Everglades, Big Cypress, and the Southeast Region, themselves significantly different from the western fire parks, but in the end, the forty-ninth state was substantially dissimilar from even the closest examples in the lower forty-eight. Fire in Alaska was perceived by land managers as an irresistible force that could overwhelm resources to battle it at any time. Alaskan fire, in the view of the conglomeration of state officials and federal agency managers who administered the vast estate of the north, was

⁶⁸ Ibid., 12-14; Dale Haggstrom, "Fire and Forest Management Policies on the Boreal Forest and Wildlife of Interior Alaska," *Wildfire*, December 1994: 31-36, ALK29; Zuckert, National Park Service Wildland Fire Report, 1989, 11-13; Zuckert, National Park Service Wildland Fire Report, 1989, 12-13; Dean Berg, National Park Service Wildland Fire Report, 1994 (Boise, ID: Branch of Fire Management, 1995), 43-45.

⁶⁹ M.R. Dick, Jr., to Boyd Evison, February 3, 1989, National Interagency Fire Center, Yellowstone Box 2, D-131, 6639, National Interagency Fire Center, Boise, ID; Alaska Department of Natural Resources, Forestry Division, "National Fire Management Policy Review," January 1989, 3-5, National Interagency Fire Center, Yellowstone Box 2, D-131, 6639, National Interagency Fire Center, Boise, ID.

natural fire at its most distinct, a clearly defined natural force that humans could not genuinely conquer or even trifle with, except at great peril and greater cost.

The result was a strategy simultaneously more open and more defensive than the one the NPS applied at Yellowstone. The openness stemmed from the acceptance of natural fire's value as a primary ecological tool, as well from the tacit admission that there was little that could be done about most Alaskan fires anyway: they would burn and that was an ecological and social good. The defensiveness resulted from the peculiar governmental circumstances in Alaska – the multiple layers of federal, state, Native, and regional agencies and their varying missions that combined to make allowing natural fire into a complicated bureaucratic exercise that seemed in and of itself to belie the very force of natural fire. In Alaska, federal agencies could not genuinely expect to implement a comprehensive suppression policy and no one associated with Alaskan fire believed that they could. As a result, the Christensen commission's findings did more to upset the existing strategies in Alaska than to reign in any tendencies toward idiosyncratic approaches. The Alaskan joint fire plan “allows substantial savings by fighting fire only where it needs suppression,” Dick noted in his letter to Evison.⁷⁰ It was the determination of where suppression was necessary that placed significant boundaries around the process.

In a 1991 response to such concerns, the NPS dispatched a team to discuss long-range fire management objectives for Alaska. NPS Fire Director Douglas Erskine and Fire Management Specialists Richard T. Gale and Rod Norum reviewed a proposal from Regional Fire Management Officer Steve Holder and Regional Prescribed Fire Specialist Brad Cella to establish an Alaska Wildfire Coordination Group. The reviewers discovered “a renewed and vigorous interest in the use of management ignited prescribed fires” among land management agencies in Alaska, and advocated enhanced planning, programming, and interagency cooperation. Their work affirmed a principle that resonated in Alaska and that the NPS embraced in the Far North. Suppression decisions “will remain with the local land manager,” Erskine informed Deputy Commissioner Ron Somerville of the Alaska Department of Fish and Game. “Because the DOI agencies manage their lands on multiple use principles, we have received favorable interpretations that wildfire surveillance is an appropriate response if it is allowed in an approved plan and determined to be the most cost effective action. . . . The DOI agencies have elected to use their Alaska fire management personnel to implement this fire policy for Alaska rather than accept a very narrow national definition.” By articulating the differences between the Alaskan experience and the rest of the nation, the NPS built stronger ties with state and local agencies and interests.⁷¹

After the early 1990s, fires in Alaska diminished enough that its issues were no longer in the forefront of national policy discussions. After 40,035 acres burned in twenty-six fires in Alaska in 1993, the acreage diminished to a low of twenty-one acres in

⁷⁰ Dick to Evison, February 3, 1989.

⁷¹ NPS Fire Director BIFC to Chief, Branch of Fire and Aviation Management, July 1, 1991, National Interagency Fire Center, miscellaneous files; Ron Somerville, Deputy Commissioner, Alaska Fish and Game to Edward F. Spang, Boyd Evison, Walt Steiglitz, and Niles Caesar, April 2, 1991 NIFC miscellaneous files; Steve Holder to Russ Hansen, May 14, 1991, Evison to Somerville, May 14, 1991, draft, NIFC miscellaneous files.

1998. Only in 1999, when fourteen fires burned across 164,397 acres did Alaska again attract policy attention.⁷²

During 1990, as large fires burned in Alaska, the NPS faced the first real challenge to its reconstituted fire management in the lower forty-eight states at Yosemite. 1990 became a brutal fire year in California, affecting the Service's ability to battle fires and all but eliminating any efforts to reintroduce prescribed fire in the western parks. As Yosemite prepared for the centennial of its establishment, the park was closed for the first time in its history. Lightning storms ignited fires in the park between August 7 and 10. Suppression efforts ensued, but failed to halt the spread. By August 10, more than 12,000 acres were aflame. Yosemite Valley and El Portal were evacuated that day, and the Merced Grove of Big Trees was threatened. Although the fires continued, they were brought under control later in the month, and the episode seemed likely to pass without renewing the controversy that dogged Yellowstone.⁷³

Later observers noted that the situation at Yosemite in 1990 roughly paralleled Yellowstone in 1988. In both fires, severe drought contributed to the accelerating danger. In both instances, high temperatures and low humidity combined with thunderstorms to intensify the fire risks. But the two parks were different both in their ecology and their vision of the role of fire. The prescribed natural fire zone boundaries had not been restricted at Yosemite in response to the Yellowstone events, making it an anomaly; in fact, they had remained stable for many years. All of the damaging fires at Yosemite occurred outside of prescribed natural fire zones, and were automatically subjected to suppression. Yosemite had long recognized that fuel conditions in the mixed conifer forest and chaparral zones were not within the natural range of variability, and that lightning fires would not be ecologically beneficial. Park managers decided that those fires could not be managed safely until more natural conditions could be restored. In Yellowstone, managers believed that conditions allowed virtually the entire park to be included in a prescribed natural fire zone. At Yosemite, those realities combined with the caution inherent in the National Park Service following the summer of 1988, and the 1990 suppression response began immediately. NPS responders were initially overmatched, but the arrival of Class I and Class II teams gave pivotal assistance. Another Class I team was ordered. The relatively small size of the fire – between 12,000 and 15,000 acres – and the combination of skilled personnel and changing weather helped bring the fires under control.⁷⁴

Yosemite's response showed how much the political climate had changed. For the previous twenty years in most circumstances, the National Park Service allowed lightning fires – the quintessential natural prescribed fire – to burn until they threatened life or property. In contrast, at Yosemite in 1990, the Service began urgent efforts to suppress immediately, setting a different management standard as a direct result of the NPS experience at Yellowstone.

Widespread media attention added to the Service's caution at Yosemite. NBC, CBS, ABC, and CNN were all present; *Good Morning America*, the *Today Show*, *Newsweek*, and *Time* all covered the fire, and countless local, regional, and national

⁷² National Park Service, *National Park Service Wildland Fire Report, 1999* (Boise, ID: Branch of Fire Management, 2000), 45.

⁷³ NPS Western Region, "Yosemite Fires, 1990," 4, 17, 81.

⁷⁴ *Ibid.*, 5.

newspapers tracked the NPS's response.⁷⁵ Park officials could be forgiven if they felt as if the media was checking up on the NPS to see how different the Service's response would be in the aftermath of Yellowstone.

By 1990, fire management had become national news, and the National Park Service found itself at the center of a public debate about how to respond. Yellowstone and Yosemite both experienced significant fires at a time when policies and public perception did not coincide. This brought the national parks further scrutiny. Even more, changing patterns of living and a callous ignorance of fire patterns had brought growing populations into potentially threatening environments, sometimes near or adjacent to national park areas. It only remained a matter of time until hillside suburbs around arid western communities faced the brunt of fires of their own.

In the early 1990s, the West turned mildly wet for a few years. The result was a clear decline in acreage burned by wildfires. The Intermountain Region of the NPS recorded fires on 30,750 acres in 1990, 7,776 acres the next year, 3,744 acres in 1992, and 14,400 acres in 1993. Fire damages in the Pacific West region decreased from 20,616 acres burned in 1990 to 6,342 acres in 1991, 11,468 acres in 1992, and 8,788 acres in 1993.⁷⁶ As a result, national park fires fell from the forefront of fire concerns. The fires that drew attention took place on the lands of other agencies.

The West's dramatic and brutal fire year of 1994 drew the issue of fire management even further from the National Park Service. In the first bad year in the region in five years, considerable NPS lands burned – 52,502 acres in the Intermountain region and another 20,565 acres in the Pacific West. The real story of 1994 became the horrific human toll of firefighting: thirty-four firefighters died in the line of duty and \$965 million was spent on suppression as fires burned on 3.5 million acres. In one tragic afternoon on July 6, 1994, in the South Canyon fire on Bureau of Land Management land outside of Glenwood Springs, Colorado, twelve firefighters and two helicopter crew members, trapped as a fire swept upslope, burned to death. Stephen Pyne opined that “the firefighters lost at the South Canyon fire were, for the fire community, the equivalent of the Army Rangers killed at Mogadishu.” Those tragic human losses inexorably altered both policy and procedure.⁷⁷

In the aftermath of the tragic summer of 1994, the National Park Service again reassessed its fire management strategies and goals. A study team of Stephen J. Botti, G. Thomas Zimmerman, Howard T. (Tom) Nichols, and Jan van Wagendonk, all respected fire researchers or managers, analyzed NPS fire problems. They advocated increasing the amount of park acreage that functioned as natural ecosystems; reducing the risk of severe wildfire in developed areas in national parks and along boundaries by clearing and the use of prescribed burning; enhancing efforts to provide information about the role of fire in parks to the public and to decision makers; increasing interagency planning; and

⁷⁵ Ibid., 85-89; Smith, *Media and Apocalypse*, 75-77.

⁷⁶ National Park Service, National Park Service Wildland Fire Report, 1999, 46-47, 58-60.

⁷⁷ National Interagency Fire Center, “South Canyon Fire Investigation: Report of the South Canyon Fire Investigation Accident Team, August 17, 1994,” (Boise, ID: National Interagency Fire Center, 1994), 1-4; Bret W. Butler; Roberta A. Bartlette; Larry S. Bradshaw; Jack D. Cohen, Patricia L. Andrews; Ted Putnam; Richard J. Mangan, “Fire Behavior Associated With the 1994 South Canyon Fire on Storm King Mountain, Colorado,” Research Paper RMRS-RP-9, (Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, 1998), 1-7; Carle, *Burning Questions*, 225; Stephen J. Pyne email to Hal Rothman, September 15, 2004, copy possession of the author.

increasing the capability to analyze data and integrate fire management into general planning and management throughout the park system.⁷⁸ The recommendations reflected the set of goals the NPS developed prior to Yellowstone, with a strong dose of the programmatic changes that followed the 1988 fires. Yet what made the report significant was its willingness to assert the value of natural fire in the aftermath of the summer of 1994. The NPS continued to embrace the role of natural fire even as such a stance became politically more difficult.

During the summer of 1994, two initially small fires at Glacier National Park attracted regional attention because the NPS was willing to let them burn. “In a year when firefighters are scrambling throughout the West, Glacier National Park managers are carefully tending a small 6-week-old fire that could potentially burn a whopping 43,000 acres, maybe twice that much,” wrote Don Schwennesen of the *Missoulan* in an overstatement of the potential impact of the fire. Such media attention could easily impede a fire manager’s desire to support prescribed burning. Even Glacier Superintendent Dave Mihalic seemed to vacillate, noting the enormous difference between a policy and its implementation. “While the public may support prescribed natural fire in theory, such discussions typically occur outside the fire season,” Mihalic told the *Billings Gazette*. Actual fire made such support tenuous at best. Nor was the park helped by a flippant comment from Flathead National Forest spokesman J.D. Coleman, who told reporters that the Forest Service “was not screwing around with prescribed fires right now.” The internal and external struggle over the fire continued into the middle of August, with the NPS closely monitoring the fire even as local and regional reporters queried locals about the policy. Rain on August 18 slowed the fire and snow and rain in early October finally removed the threat.⁷⁹

In the end, one of the two fires, the Howling Fire, proved a triumph for prescribed natural fire. Although the fire was routinely termed “controversial” by regional media, the pressure on the National Park Service was not sufficient to compel suppression action. The Service stuck to principle despite the discomfort it caused local managers. “If we would have put the fires out just because of the (fire) activity around us and political developments,” observed Glacier National Park Fire Management Officer Fred Vanhorn, “we, in effect, (would be) saying that we were not going to allow significant prescribed natural fires to occur in Glacier.” NPS staff felt that the Howling Fire provided an important lesson that could be used as a model elsewhere in the park system. By holding firm to established policy even under political pressure, Glacier National Park proved that prescribed fire could take place, even when at the time fire was a severe problem elsewhere in the region or in the park system.⁸⁰ This was a step toward the more comprehensive vision of the role of prescribed natural fire held by most fire scientists and ecologists inside and outside of the national park system.

The National Park Service continued to develop and support its prescribed natural fire program. In an important workshop in San Francisco early in 1995, the NPS

⁷⁸ Stephen J. Botti, G. Thomas Zimmerman, Howard T. Nichols, and Jan van Wagendonk, “Fire Management and Ecosystem Health in the National Park System: Problem Analysis,” (Boise, ID: NPS Branch of Fire and Aviation Management, 1994), 1-4.

⁷⁹ “Let it Burn?” *Billings Gazette*, August 4, 1994; Don Schwennesen, “Glacier Goes for the Burn,” *The Missoulan*, August 7, 1994, B-6; “GNP Managers Consider Their Options,” *Glacier Reporter*, August 11, 1994; David Carkhuff, “The Howling Fire,” *Hungry Horse News*, August 18, 1994,

⁸⁰ “Howling Fire,” *Hungry Horse News*, October 6, 1994, 5.

reaffirmed its commitment to the concept. The period following 1988 had been marked by an aversion to the risk of an escaped prescribed natural fire. With the minimization of risk as a goal, the burn program could be scored a success. But if the goal was to implement prescribed natural fire programs that were ecologically significant, “pretty disappointing” was a better description of the situation. “We need to find a way for prescribed fire and wildfire programs to coexist during the normal fire season,” the meeting summary recorded. Such a strategy would require expanding prescribed natural fire while maintaining an acceptable level of risk.⁸¹ This was as difficult as the NPS agency mission: to preserve for the future while accommodating the present.

On the ground, new innovations revealed new approaches to fire. In 1995, the NPS introduced its new Prescribed Fire Support Module (PFSM) program. The PFSM program provided mobile tactical support nationally for parks with prescribed fire programs. Because they were specifically unavailable for wildfire response, the NPS teams, initially consisting of four groups of five members, guaranteed experienced professional attention for prescribed fire. This new emphasis reflected the internal push toward the embrace of prescribed fire that characterized NPS thinking after Yellowstone. Subsequently similar teams designed to manage prescribed natural fire were introduced. When the NPS lifted the budgetary ceiling on prescribed natural fire, it effectively removed the rationale for converting fires from the prescribed natural fire category into the wildfire category as a way to access resources. This development further contributed to the growing role for natural prescribed fire in the NPS.⁸²

The idea that the National Park Service would risk potential political pressure in the name of a clear ecological and resource management goal spoke volumes about the commitment of the Service’s fire apparatus to the goals of the previous twenty-five years. Despite the enormous negative publicity associated with the Yellowstone fires and the intense scrutiny and micromanaging that the NPS experienced in its aftermath, the Service had a vision of appropriate strategy and was willing – within reason – to take risks to implement it. At a time when morale was low throughout the National Park Service, due in large part to Director Roger Kennedy’s 1995 reorganization of the service and the way in which it transferred authority and influence from central offices to the field, this firm stand on principle proved an inspiration to many in the NPS.

By this time, the NPS had become a premier fire management organization in the federal land management system. Despite the scrutiny that the Service experienced in the aftermath of Yellowstone, two decades of planning and implementation designed to support clear and distinct goals and objectives had propelled the NPS forward. The Service had responded to a variety of challenges, putting its most creative thinkers into the process of fashioning response. Its practices and procedures had become models for changes in other agencies.⁸³ The National Park Service’s initial recognition of the value of fire as a tool for landscape management led the other agencies; over time its models

⁸¹ Prescribed Natural Fire Workshop, San Francisco, California, January 3-5, 1995, Meeting Summary,” NIFC, miscellaneous files.

⁸² Ben Jacobs, “NPS Prescribed Fire Support Modules-A Pilot Program,” *Fire Management Notes* 56 2 (1996): 4-5; n.a. “Prescribed Fire Support Crew: Pilot Program 1995,” Bandelier National Monument, Y14 (PFSC), n.d ca. 1995; Robert Hunter Jones, “National Park Service Prescribed Fire in the Post Yellowstone Era,” *Wild Earth* (Summer 1997), 27-28.

⁸³ NPS Fire Director, NIFC to Regional Directors, November 1, 1994, NIFC A56 (Fire) Y 1421; Associate Director Operations to Regional Director, Western Region, December 5, 1994.

were picked up and implemented as suppression-oriented agencies such as the Forest Service and the Bureau of Land Management first watched cautiously and then joined in. When the NPS started down this road, the set of ideas that included managed fire – most prominently, that fire was a productive force in ecological management – was hardly standard thinking. By the early 1990s, the NPS’s rationale had become the standard for management. Its programs had been extremely successful in changing the way fire was used throughout the federal land management system, and its ideas had permeated national fire management. Combined with thoughtful leadership and astute planners and implementation teams, the money and attention the Service invested in its fire programs had paid significant dividends.

Success bred some vexing consequences as well. It led to an ideological commitment to fire’s restoration in land management, the sometimes blind goal to introduce fire without clear definitions of appropriate circumstances. Using fire as a tool superseded management as a goal in some circumstances, leading to questions about NPS decisions and goals. Compounded by the reorganization of 1995, erosion of agency experience through early retirement and attrition hit fire management as well as every other dimension of NPS operations. Other agencies recognized the value of the Service’s experience and recruited its personnel. In a testament to the value of the fire program, many members, despite strong loyalty to the NPS, felt an equally powerful drive to spread their message to peer agencies.

In 1995, a revised national fire policy was completed. The NPS played an important role in shaping the document. A direct result of the 1994 fire season and the South Canyon tragedy, the new document articulated nine management principles that sounded much like the NPS’s goals. Under this document, public and firefighter safety remained the top priority. Wildland fire was seen as an essential ecological process and agent of natural change that had to be incorporated into planning. Fire management plans were required for every federally administered area with vegetation that could burn and fire planning had to be designed to support land and resource management planning. Risk management became a foundation for fire management. Fire management programs had to be economically feasible and had to be based on the best available science. The plans had to incorporate environmental quality and public health considerations. Cooperation with other governmental and non-governmental entities was essential and the standardization of policy among federal agencies was to be an ongoing objective. The plan emphasized indirect attacks on fire, the sort of response that had characterized the response to the Yellowstone fires in 1988, as a safer strategy than the direct confrontation of firefighting lore. A full range of responses was permitted, allowing a measure of flexibility than had never before existed across the full spectrum of federal agencies. Any approach, from basic monitoring to full-scale suppression, could be implemented under the right circumstances, a substantial shift in the way federal agencies approached fire. In effect, the federal system changed from looking at the origin of a fire to looking at its circumstances as the basis for decision making.⁸⁴

The new policy led to greater coordination and cooperation among federal land management agencies. An implementation plan in 1996 translated the vision into a series

⁸⁴ U.S. Department of the Interior, U.S. Department of Agriculture, “Federal Wildland Fire Management: Policy and Program Review, Final Report, December 18, 1995,” (Boise, ID: National Interagency Fire Center, 1995), 3-9; Carle, *Burning Questions*, 225.

of programs, dividing the initial recommendations into geographic concerns and long-term commitments. The difference suggested the enormity of the task that confronted federal fire managers, as well as the need for clear signposts – not only to gauge progress but to remind everyone of the direction in which fire management planning was going. Ongoing policy reviews and innovation led to further planning and new goals. A new resource allocation strategy in 1998 sought to develop an interagency process to distribute fire management resources while efforts continued to move fire management policy toward implementation throughout the national park system.⁸⁵

The new policies accelerated the implementation of the fire management strategies that originated in the National Park Service across the federal land management system. Between 1995 and 1999, federal agencies more than doubled the acreage treated with prescribed burning, reaching 2.2 million acres as the new century began. The NPS had been a small portion of that new emphasis, burning 59,495 acres in 1995, 42,511 acres in 1996, 69,481 acres in 1997, and 82,413 acres in 1998, finally topping the 100,000-acre total in 1999 with a total acreage burned of 132,665. With the exception of 1999, the second half of the 1990s showed no significant difference from NPS prescribed burning during the first half of the decade. The shift in national emphasis had little impact on NPS practice, leading to questions about whether the bold promises of the mid-1990s amounted to significant changes in practice.⁸⁶

The national fire policy codified Service values but it further shifted the emphasis of federal fire management away from the NPS. Beginning in 1994, difficult fire seasons followed on a two-year cycle, in 1996 and 1998, coinciding with the national election schedule and becoming a political issue. Most of the fires occurred on Forest Service or BLM land, with the NPS contribution mainly resources to fight the fires. The attention went away from NPS programs and ideas as wildfires on federal land became staples on the evening news and part of a larger national discussion about the role of government in the aftermath of Congress's failed "Contract with America," an effort to shape national priorities with unrealistic and possibly harmful policy promises from elected officials, in 1994 and the shutdown of the federal government late in 1995. In an age when questions about the size and function of government were part of the national dialogue despite a vibrant economy, the image of fires burning out of control suggested inefficiency in the eyes of an uninformed public.

The National Park Service continued to develop strategies for addressing fire. In 1996, NPS Fire Director Doug Erskine pointed to a significant improvement in the tools available "for expanding the use of fire in national parks." Prescribed fire modules had been thoroughly tested and proven successful, and their use had been expanded. In 1996, the NPS established four prescribed natural fire management teams, with a planned increase to six in 1997. Dedicated fire specialists were located in the Midwest, Intermountain, and Pacific West regions, and the Southeast and Northeast field areas shared another team. A significant change in funding allowed further development of the

⁸⁵ U.S. Department of the Interior, U.S. Department of Agriculture, "Federal Wildland Fire Management: Policy and Program Review, Implementation Action Report, May 23, 1996" (Boise, ID: National Interagency Fire Center, 1996), iii; Resource Allocation Task Group, "Implementation of Federal Wildland Fire Management Policy: Allocation of Resources, June 15, 1998," (Boise, ID: National Interagency Fire Center, 1998), 4-8.

⁸⁶ Carle, *Burning Questions*, 225; National Park Service, "National Park Service 1999 Wildland Fire Report," 41.

NPS response to prescribed natural fires. Congress permitted the NPS to fund the operational aspects of prescribed natural fire from the suppression fund. This was in line with the 1995 fire policy, which stated that all unplanned ignitions could be managed along a spectrum of appropriate management responses from full suppression to monitoring. Since all these events were unplanned “emergencies,” they could all be managed by tapping emergency suppression funds. Combined with the endorsement of the Federal Wildfire Management and Program Review (FWMPR) – designed to cross agency boundaries and to be based on the best available science – and of the Secretaries of the Interior and of Agriculture, the NPS could claim that its approach to fire had shaped federal policies.⁸⁷

Throughout the remainder of the 1990s, fire policy remained an important component of federal land management that largely embraced the principles the NPS had developed since the 1970s. In a perplexing turn of events, national park lands were not the focus of the program, something for which the National Park Service could be grateful. A truly national system had developed, one focused on firefighter safety, land restoration, and federal lands other than the park system. The centrality that the Service achieved after 1968 had begun to wane, leaving the NPS with enormous fire management issues that increasingly were apart from the issues and direction of national fire policy.

⁸⁷ National Park Service, “National Park Service 1996 Wildland Fire Report,” (Boise, ID: National Park Service, 1997), 3-4.

Chapter 8:

The Hazard of New Fortunes:

Outlet, Cerro Grande, and the Twenty-First Century

The National Park Service could be forgiven for thinking that its efforts to institute fire management during the last twenty-five years of the twentieth century were cursed. After Yellowstone in 1988, NPS efforts to mitigate fire and to plan for its management throughout the national park system met with great success during the next decade. The Service evaluated its response to fire, designed new mechanisms to bring practice and ideology into a coherent relationship, and invested resources in internal responses and in interagency planning, resource acquisition, and deployment. By the late 1990s, fire managers felt they could view their very complex field with a little more ease. The development of a national fire planning and management structure – the new standards the NPS successfully implemented and the remarkable biological renewal of Yellowstone – combined to give the Service’s fire management greater credibility with the public than it had ever before enjoyed.

Ironically, the urban fires of the 1990s, especially the Oakland-Berkeley Hills fire in 1991, actually improved the Service’s status. Mike Davis’s *Ecology of Fear: Los Angeles and the Imagination of Disaster*, reached No. 1 on *The New York Times* bestseller list and sparked a controversy over whether communities that built in hazardous fire areas merited the response of public services. One chapter, entitled “The Case for Letting Malibu Burn,” spurred particular animosity even as it directed much of the rancor about fire away from the National Park Service. Davis argued that communities that allowed home construction in what were clearly hazardous locations deserved to face fire without the deployment of external resources, shifting the debate over practice from federal agencies to cities and counties.¹ For a moment, Americans seemed poised to enter a dialogue about the responsibility of communities for the fires they encountered.

The phenomenon that historian Lincoln Bramwell called “wilderburbs” – communities that emerged at the nexus of rural and wild land and urban expansion to enjoy the amenities of each – combined with Davis’s work to ignite a debate about the siting of new communities in the post-urban West. Federal agencies removed fallen trees and underbrush on more than 2.2 million acres in 1999 alone to limit the chances of fires. Still, more than 200 million acres historically prone to frequent fire carried the heavy underbrush associated with suppression. The result was dangerous and left not only federal land managers, but also officials at the state, county, and even local levels in a

¹ Mike Davis, *Ecology of Fear: Los Angeles and the Imagination of Disaster* (New York: Metropolitan Books, 1998), 93-148.

difficult situation.² Urban and suburban sprawl had become endemic nation-wide; in the West it encroached on national park areas and added a range of new problems for their managers. Much of the region lacked adequate mechanisms to regulate suburban planning. As a result, communities grew nearly everywhere, adding not only the threat of accidental or intentional fires from nearby populations to the problems of park managers, but also the possibility that such communities, located without much more than a nod to safety from wild fire, might very well serve as conduits for the inevitable fires in a region's drier sections. Even as the National Park Service grappled with urban parks such as Golden Gate National Recreation Area, urbanization and its attendant sprawl encroached on previously remote or distant national park areas in the West and throughout the nation.

By the mid-1990s, the National Park Service had achieved the respect of the fire community as well as many accolades for its approach to fire management. The common federal fire policy of 1995 signaled the further ascent of the NPS and its ideas and values to a position nearly parallel to that of the Forest Service. The NPS model of fire management, begun in the 1960s, had become the currency of federal fire policy. The importance of the NPS philosophy became solidified when other federal agencies recruited NPS fire personnel for their agencies, a reversal of a 60-year trend of personnel movement from the Forest Service to nearly every other federal land management agency that had dominated fire management since the NPS hired John Coffman in the late 1920s. The desirability of National Park Service personnel to other agencies further illustrated the thirty-year leadership of the NPS in fire management.

At the same time, a long series of drought years in the West that began in the mid-1990s contributed to a critical change in regional fire patterns. The growing problem of fires that existed near wilderburbs shifted the fire focus back toward conventional historical models of suppression. Damage to property and threats to human life remained situations where immediate suppression was the sole management alternative. By 2000, the Forest Service had regained an important measure of its earlier position. Many of the major fires were on its lands, and its holdings included many of the places where wild land and urban growth coexisted so uneasily. In effect, the sheer volume of fire pushed the Forest Service back toward center stage, where actions superseded ideas for the first time in a generation.

As spring turned to summer in 2000, a pair of nearly simultaneous escaped prescribed fires on national park lands illustrated the gravity of the changes occurring in fire management, as well as the fundamentally tenuous nature of all existing strategies to manage, combat, or regulate fire. The emphasis on prescribed burning that characterized the period after the new national fire plan in 1995 yielded tremendous benefits for the NPS, but contained parallel risks. The acceleration of prescribed burning programs treated considerable acreage, but as always, a great deal of land experienced no such management. The reasons varied; in some cases, prescribed burning was deemed too dangerous because of the proximity of communities, facilities, and other development. In far more instances, the resources were insufficient, the time to undertake such a program too short, or the conditions were deemed too unsuitable. The NPS treated as much land as

² Lincoln Bramwell, "Wilderburbs: The Rise of Rural Development in the Rocky Mountain West, 1960-2000," (Ph.d. diss., University of New Mexico, Prospectus, 2003); David Carle, *Burning Questions: America's Fight with Nature's Fire* (Westport, CT: Praeger Press, 2002), 225-26.

it could and planned for more, all the while recognizing the inherent risk in any program that allowed fire in any way. With the ongoing drought and some simple bad fortune, risk came to the forefront in May 2000.

On the north rim of the Grand Canyon, where the connection between wild land fire and urban expansion was at best remote, the Outlet Fire near North Rim Village on the North Rim in April and May 2000 illustrated one of the fundamental problems with introducing fire. By 2000, Grand Canyon had engaged in a prescribed burning program for almost two decades. A fire management plan, approved in 1992, had been revised in 1993, 1994, and 1995. These reviews looked at program successes and identified areas of concern. A 1997 NPS review team identified a particular long-standing problem in the North Rim forests, an accumulation of litter such as fallen trees, branches, and shed leaves and needles. Combined with an invasion of spruce and fir thickets that provided fuel ladders that could lead to enormously destructive crown fires, this set up a potentially dangerous situation. The problem first had been recognized on the North Rim in 1981 by Regional Plant/Fire Ecologist Kathleen Davis and reiterated during the 1990s. The 1997 review team recommended the development of a landscape-level prescribed burning program for the North Rim forests.³

The team of experienced fire managers who undertook the 1997 review— Steve Botti, Jim Douglas, Steve Tryon, and Wally Josephson – recognized the North Rim as an example of the problems of fuel load accumulation that vexed so much western wild land and remained the subject of powerful debates in the professional and scholarly fire community. Its members recognized that the existing prescribed burning program on the North Rim had only achieved some of its stated goals. The suppression of two prescribed burns that escaped, the Mathes and the Northwest III fires, along with concerns about smoke that marred visitors’ experience, led to what the review team described as a “conservative approach” to the reintroduction of fire as a management tool at the park. Yet, the team found Grand Canyon more willing to be aggressive in its response than it had been in the past.⁴ The review opened the way for a more aggressive prescribed burn policy.

An appropriate strategy for the introduction of prescribed fire provided the park with a philosophical choice. The Grand Canyon had been thoroughly studied by a range of scientists, and different schools of thought offered their own remedies for the North Rim problems. Headed by Professor W. Wallace Covington of Northern Arizona University, an experienced fire scholar who focused his research on the Grand Canyon, some researchers believed that because of the particular circumstances of the North Rim – the heavily loaded Ponderosa Pine-mixed conifer forest – it required mechanical thinning of the biomass before introducing prescribed fire. In deference to this research, the review team suggested that “testing the truth of this hypothesis should be a central component of the park’s fire management program over the next five to ten years.” The advantages were obvious: reduced risk to land and people; an opportunity to have a

³ Steve Botti, Jim Douglas, Steve Tryon, and Wally Josephson, “Trip Report: North Rim of the Grand Canyon Fire Management Program Review, August 12-14, 1997,” Grand Canyon, 1; Regional Plant/Fire Ecologist, Division of Natural Resource Management, Western Region to Regional Director, Western Region, October 23, 1981, Grand Canyon Fire Collection, Grand Canyon National Park.

⁴ Botti, Douglas, Tryon, and Josephson, “Trip Report: North Rim of the Grand Canyon Fire Management Program Review, August 12-14, 1997,” 1-2.

prescribed fire regime mirror natural fire as opposed to serve as a replacement for its absence, opportunities to assist local residents with timber sales and other economic advantages of such cutting; and the avoidance of the social and political fallout that typically accompanied smoke emissions. The disadvantages included the social consequences of the removal of as much as 90 percent of the North Rim's forests, with visitors in particular expected to balk at what they would certainly see as a denuded landscape; the problems such logging might cause for wilderness designation and wilderness study areas; the threat of severe wildfire before the thinning could take place and the attendant problem of burning the slash that remained; as well as the consequences of the many stumps that would be visible to the traveling public that held a decidedly different view of what a national park should look like. The review also presented the problem of cost. Even with timber sales and slash logging, the expense might be prohibitive.⁵

After weighing the conditions of the situation and possible solutions, the team made clear recommendations for a more aggressive prescribed burn policy. Team members wrote in their report, "It appears that a greatly expanded program to use fire as a management tool offers the best hope for preventing catastrophic wildfire and restoring the natural ecosystem in the long run." Resources were available for hazardous fuel reduction and Grand Canyon had begun to use them to carry out large-scale burns when weather and other conditions permitted. The team also recommended using nearly every "tool in the toolbox" – mechanical thinning, planned ignitions in key areas, and the ideas of Covington and other scholars about the impact of fire on native plants. Broad-based and innovative, the park adopted the report's ideas in a 1998 revision of its fire plan.⁶

In accordance with that plan, on April 25, 2000, Grand Canyon ignited the Outlet prescribed burn, an area at about 8,400 feet, in a region of mixed conifer and Piñon-Juniper complex just west of the developed area on the North Rim. The goals of the prescribed burn were to perpetuate natural processes and reduce hazardous fuels. On April 27, another fire, on the Tiyo Sub-unit, had an incomplete ignition that resulted in a "dirty burn," but despite predications to the contrary, it remained inside its prescription area. On May 8, firing began on the east side of the Widforss Sub-unit on the Outlet Fire. The burn proceeded in accordance with expectations until the next day. A wind came up on May 9 and an undetected spot fire on the Widforss Sub-unit grew until it exceeded the parameters of its prescription. This threatening situation drew scrutiny from park officials, and later that day, when weather experts predicted strong winds for the next day, Grand Canyon Superintendent Robert L. Arnberger declared both the Tiyo and

⁵ Ibid, 2-4; W. W Covington and M.M. Moore, "Post-Settlement Changes in Natural Disturbance Regimes: Implications for Restoration of Old-Growth Ponderosa Pine Ecosystems in Old-Growth Forests in the Southwest and Rocky Mountain Region," *Proceedings of the Symposium*, March 9-13, 1992, Portal, Arizona, USDA Forest Service General Technical Report RM-213 (Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO), 81-99; W. W. Covington and M.M. Moore. "Southwestern Ponderosa Forest Structure and Resource Conditions: Changes since Euro-American Settlement," *Journal of Forestry* 92 1 (1994): 39-47; W. W. Covington and S. Sackett, "Soil Mineral Nitrogen Changes Following Prescribed Burning in Ponderosa Pine," *Forest Ecology and Management* 54 (1994), 175-191; W. W. Covington, R.L. Everett, R.W. Steele, L.I. Irwin, T.A. Daer, and A.N.D. Auclair, "Historical and Anticipated Changes in Forest Ecosystems of the Inland West of the United States," *Journal of Sustainable Forestry*, 4 2 (1994).

⁶ Ibid., 6-9; Outlet Prescribed Fire April 2000, 14-23; Fire Behavior Modeling for Outlet Prescribed Fire Project, 41-49, Grand Canyon, Fire Collection, Grand Canyon National Park.

Outlet as wildfires. He alerted the Type II Northern Arizona Incident Management Team, headed by Incident Commander Larry Anderson, and asked it to be ready to take over fire suppression efforts.⁷

On May 10, the velocity of the winds dramatically rose, changing Grand Canyon's response to the Outlet Fire. Gusts reached sixty miles per hour, and by 2:30 p.m., the park was evacuating the North Rim of the Grand Canyon. After a difficult night, when snags and fallen green trees blocked roads and fire crews were forced to bed down in the open to avoid hazards such as falling trees, transfer of command to an incident management team began at a 7:00 a.m. meeting. By May 11, the fire was estimated to cover between 1,500 and 2,000 acres, but much of the burning land was close to the developed areas at North Rim Village. This had potentially severe consequences. At the Nankoweap trailhead, visitors were stranded beyond the fire and hemmed in by downed trees, adding a search and rescue dimension to the obligations of the incident management team when it took charge of the fire.⁸

The single largest problem the incident management team faced was a shortage of suppression resources at Grand Canyon. Fire-fighting personnel were in short supply, with only two Interagency Hotshot Crews and two Type II crews available. "A couple of Class 6 engines, 3 prescribed fire modules, and a helicopter that couldn't fly in the high winds" were all the resources available, Al Hendricks of the Northern Arizona Incident Team wrote. "Suppression resources on the fire were meager." The fire had grown much larger by the time the Type II team took charge, with aerial observation indicating it had reached 7,000 acres. Plans to call in a Type I team gained momentum, with input from the Washington office of the National Park Service. The Type II team established a camp on the Kaibab National Forest, just outside the park boundary. The winds died down on May 12 and 13, and the arrival of the Northern Rockies Type I incident team headed by Steve Frye and its personnel helped provide the workpower to initiate suppression. "We can fight this fire aggressively," Frye told the press, "but we first do it safely and with sensitivity to the area's natural and cultural resources." By Saturday May 13, when the Type I team took control of the fire, a full complement of suppression resources became available.⁹

During the next week, suppression remained the sole mode of response. Stronger winds and low humidity aided the fire's growth on May 14, but 800 firefighters continued to dig handlines, providing 20 percent containment. High winds the following day contributed to continued erratic fire behavior. Although the blaze did not cross any established control lines that day, the park reported containment at 43 percent. On May 16, the fire grew to 13,350 acres, even as the total force fighting it reached 914. Favorable weather conditions on May 17-18 helped crews start to gain control of the fire,

⁷ Al Hendricks, "Outlet Fire Incident Narrative," May 2000, Grand Canyon, 1; National Park Service News Release, "Outlet Fire and Grand Canyon National Park," May 12, 2000, Grand Canyon Fire Collection, Grand Canyon National Park.

⁸ Al Hendricks, "Outlet Fire Incident Narrative," May 2000, Grand Canyon National Park, 1; National Park Service News Release, "Outlet Fire and Grand Canyon National Park," May 12, 2000, Grand Canyon Fire Collection, Grand Canyon National Park.

⁹ Al Hendricks, "Outlet Fire Incident Narrative," May 2000, Grand Canyon, 3-4; National Park Service News Release, "Outlet Fire and Grand Canyon National Park," May 13, 2000; National Park Service News Release, "Outlet Fire and Grand Canyon National Park," May 15, 2000, Grand Canyon, Fire Collection, Grand Canyon National Park.

and with sixteen miles of handlines completed and as many as six left to dig, the fire was reported to be 56 percent contained. Superintendent Arnberger expressed his support and gratitude for the work of the fire crews. On May 19, he declared that the North Rim would reopen to visitors on Monday, May 22. By Sunday night, Incident Commander Steve Frye could report total containment of the Outlet Fire.¹⁰

After the incident, the assessment of the fire showed little culpability on the part of Grand Canyon. An investigative team, led by co-chairs William F. Paleck, superintendent of North Cascades National Park and Forest Supervisor Rodd Richardson of the Bitterroot National Forest and committee members Bill Clark, the Idaho state fire management officer of the Bureau of Land Management, Bill Wallis, Colorado state fire management officer of the BLM, Ron Hamilton of the Forest Service, Stephen G. Jakala, fire management officer at Voyageurs National Park, Greg Harmon of the National Weather Service, and Tom Pittenger of Grand Canyon National Park, generally praised NPS preparation and handling of the fire. The “overall competence, professionalism, and accomplishments” of the Grand Canyon Prescribed Fire program was unassailable in the investigation team’s assessment. The problems it identified – that fire leadership was, in the words of the report, “spread too thin for too long,” and that the plan did not contain enough contingency triggers in case of escalation – were minor. “The prescribed burn program at Grand Canyon National Park is fundamentally sound,” the report concluded. “Continuation and even expansion of current program levels is absolutely necessary to safeguard the park from the effects of nearly 100 years of fire exclusion.”¹¹

The Outlet Fire was dramatic and its small size and disproportionate impact served to illustrate the growing dilemma of the twenty-first century American West, where the wide-open spaces were increasingly dotted with people. Using fire in the proximity of people – whether visitors to the North Rim, gateway communities, or suburban development in general – affected the way in which federal agencies, including the National Park Service, could conceive of its use. The effects of ecological restoration and the introduction of fire had to be deftly balanced with those of adjacent communities and travelers, concessioners, and others. Even the most adroit calculation could spiral out of control, as the Outlet Fire on the North Rim of the Grand Canyon showed.

At the same time, the review of the team’s actions highlighted the ways in which the problems with fire were inherent and random. The Outlet Fire could have happened anywhere at any time; it resulted not from bad planning or decision-making, the review committee concluded, but from changing natural conditions. Unlike earlier fires where critics pointed to flawed policy or mistakes in implementation, at Outlet the NPS made no significant errors in planning or operations. Fire management included risk; the assessment of that risk was more a political and cultural question than an ecological one.

¹⁰ National Park Service News Release, “Suppression Continues on the Outlet Fire,” May 13, 2000; National Park Service News Release, “Outlet Fire and Grand Canyon National Park,” May 15, 2000; Northern Rockies Incident Management Team, “Predicted High Winds Cause Concern on the Outlet Fire,” May 16, 2000; Northern Rockies Incident Management Team, “Outlet Fire Update, May 17, 2000;” Northern Rockies Incident Management Team, “Outlet Fire Update, May 18, 2000;” Northern Rockies Incident Management Team, “Outlet Fire Update, May 19, 2000;” Northern Rockies Incident Management Team, “Outlet Fire Update, May 21, 2000,” Grand Canyon.

¹¹ William F. Paleck, Rodd Richardson, Bill Clark, Bill Wallis, Ron Hamilton, Stephen G. Jakala, Greg Harmon, and Tom Pittenger, “Outlet Prescribed Fire Project, Grand Canyon National Park, Investigative Report, May 2000,” <http://www.nps.gov/grca/fire/outlet/report>.

Critics might chafe that in an era of constant weather surveillance, such a wind as the one that caused the outbreak should be predictable, especially during the late spring, the review said. Typically, this was the season of the largest fires in the region, and critics reminded the NPS that no one else was conducting burn operations at the time. Still, National Park Service officials retorted, any time the NPS introduced fire, no matter how valuable that fire might be, the potential for its escape existed as well as an attendant array of problems that had little to do with the ecological value of fire.

At about the same time, a second prescribed fire escaped its control lines. It occurred in precisely the kind of area that demanded an answer to the questions that the response to the Outlet Fire successfully skirted. Located on the Pajarito Plateau about forty miles from Santa Fe, New Mexico, the federal government established Los Alamos during World War II as a secret community where research into splitting the atom and the development of an atomic bomb took place. In this way and in almost every other social, cultural, or economic matrix, Los Alamos was atypical of western communities. Its level of education, demography, and economic structure could not be replicated in the interior West, nor was there anywhere else as exclusively dependent on Ph.D.-level research between the Sierra Nevada and the Mississippi River.¹² Despite this tremendous difference from the world around it, Los Alamos was entirely typical in other ways. In its location amid a stunning environment, urban growth, and proximity to a heavily visited national park area, it served as a bellwether of the problems the National Park Service faced with the growing number of communities near its parks and the threat of fire.

The Los Alamos area had been the scene of a number of fires that were frightening more because of their impact potential than their size. La Mesa in 1977 had been the first of significance since the siting of the Manhattan Project that built the atomic bomb in the 1940s; later outbreaks in 1996 and 1998 – the Dome and Oso fires – illustrated that the long-standing practice of excluding fire in the vicinity had created a terrifying prospect: a heavily fuel-laden region with an urban area at its core. Studies by ecologist Craig D. Allen and dendrochronologist Tom Swetnam suggested that the last thorough burn on the location of Los Alamos took place in 1881 whereas throughout the eighteenth and nineteenth centuries, significant fires occurred about every six months. When grazing began in earnest in the late nineteenth century, fires had diminished; in the aftermath, the practice of exclusion guaranteed dense forest with a great deal of understory – conditions ripe for severe fires. What made the situation even more dangerous was the proximity of the town of Los Alamos and the Los Alamos National Laboratory, where significant experimentation with weaponry still took place and where the U.S. government had stored radioactive and explosive materials. Although everyone knew that Los Alamos housed weapons research and contained an array of dangerous compounds and chemicals, national security constraints restricted information. Firefighters had little idea of what they might encounter.¹³

¹² Hal K. Rothman, *On Rims and Ridges: The Los Alamos Area Since 1880* (Lincoln: University of Nebraska Press, 1992); James Kunetka, *City of Fire: Los Alamos and the Birth of the Atomic Age, 1943-1945*, rev. ed. (Albuquerque: University of New Mexico Press, 1979).

¹³ Craig Allen, "Panel Discussion: Cerro Grande Fire," First National Congress on Fire Ecology, Prevention, and Management, San Diego, CA, December 1, 2000; Craig D. Allen, R. Touchan, and Thomas Swetnam, "Landscape-Scale Fire History Studies Support Fire Management Action at Bandelier," *Park Science*, 15 3 (1995), 18-19.

When NPS officials from Bandelier National Monument authorized a prescribed fire for Upper Frijoles Creek drainage on April 19, 2000, they could not have anticipated that the fire would be the catalyst for another reevaluation of fire in the national park system. Park officials selected the Upper Frijoles drainage units 1 and 5 for the burn. An earlier effort to burn unit 1 in 1993 had not achieved desired results, but in accordance with the park's fire management plan, efforts to burn these areas continued. The 1993 fire had only minimally diminished the load of 34.4 tons per acre before the burn, to 29 tons per acre, a 16 percent reduction. The primary purpose of the 2000 burn was to reduce hazard fuels in the units. A three-part approach was approved. The park needed dry conditions to achieve its goals everywhere but in the high-elevation grasslands. The planned first phase was to burn the upper area that included the grasslands; the second phase was to burn the timbered areas and the drier, south-facing slopes throughout the area. Managers planned to delay the third phase until the wettest areas of the units were dry enough to burn.¹⁴

Bandelier's prescribed fire initially seemed to be an ordinary event. After a May 4 amendment to the plan, which excluded private property on the Valle Grande from the project, the burn boss, Mike Powell, made the appropriate notifications and conducted the required briefings. The holding boss called for the spot weather forecast. At 7:20 p.m. on May 4, crews ignited a test fire atop Cerro Grande in the Jemez Mountains in the westernmost part of the park. By 8 p.m., the test fire was completed and officials deemed it within prescribed parameters. By 10 p.m., crews completed the ignition process on the northeast edge of the fire area. At 11:15 p.m., ignition of the northwest area began.¹⁵

By the early morning of May 5, the Cerro Grande Prescribed Fire had begun to spread beyond the boundaries of its prescription. At 1 a.m., crews reached the upper saddle and spent ninety minutes bringing the fire back into the saddle from the knob. Ninety minutes later, the fire seemed under control, and the burn boss and crews stopped to rest. At 3 a.m., the burn boss asked for help from a Type III team with a helicopter and a twenty-person hand crew, and requested Bandelier Engine 91 to come on duty at 5:30 am. Although it was not customary to order helicopters for prescribed burns, Bandelier's fire management officer and the zone dispatcher agreed that the resources, ordered for a wild fire burning in the Santa Fe National Forest, would be diverted to the prescribed burn on national park land.¹⁶ Although this was a little unusual, officials believed the burn still seemed manageable with little more than typical resources.

By 10 a.m., conditions seemed more threatening. Wind changes initially created some spotting within the designated area, and slopover, firefighting terminology for when a wildfire crosses a control line, on the upper east part of the fireline caused some concerns. The crew on the northeast side reported difficulty in containing the fire within the designated boundaries. Managers requested water drops and extra firefighters. At 10:30 a.m., a helicopter dropped two people off on the northeast side of the fire and departed to pick up the bucket and begin water drops. At 11 a.m., the Type I hand crew

¹⁴ Fire Investigation Team, National Interagency Fire Center, "Cerro Grande Prescribed Fire, May 4-8, 2000, Investigation Report, May 18, 2000," (Boise, ID: National Interagency Fire Center, 2000), 9-11.

¹⁵ Ibid. 10.

¹⁶ Ibid., 11; State of Florida, Bureau of Land Management, U.S. Forest Service, and White Mountain Apache Tribe, *Cerro Grande Prescribed Fire: Independent Review Board Report* (Washington, D.C.: National Park Service, 2000), 1-15; National Park Service, *Board of Inquiry, Cerro Grande Prescribed Fire, Final Report, February 26, 2001* (Washington, D.C.: National Park Service, 2001), 42-52.

arrived, with five of its members heading to the west line, while the remaining thirteen went to the troubled northeast side. An air tanker was requested for the slopover, and it arrived at 12:55 p.m. Five minutes later, Powell converted the prescribed fire to a wildland fire, changing his status from burn boss to incident commander.¹⁷

During the subsequent thirty-six hours, the regional fire apparatus responded to the new situation. Paul Gleason, an experienced NPS fire manager, took over as Incident Commander, and he briefed park management on the renamed Cerro Grande Fire. He, Bandelier's fire management officer, and the chief of resource management designed a Wildland Fire Situation Analysis (WFSA), which Superintendent Roy Weaver approved on the evening of May 5. Gleason made several critical tactical decisions. He saw the problems the hotshot crew faced on the underslung line, when a hand crew or bulldozer constructs a fireline horizontally across a slope below a fire, which had to be scraped and cut beneath overhead trees, some with dead limbs. He decided that crossing the face of the mountain was too dangerous. "I gave to the park superintendent, as my preferred alternative, to go indirect, down to Route 4," he recalled in a panel discussion about the fire. Crews improved the existing fire lines and blacklined with drip torches, utilizing a portion of burned acreage, "the black," as part of the fire line they constructed. The strategy had been set.¹⁸

At first, it seemed to work. A National Weather Service spot forecast at 11:55 p.m. on May 5 called for a fire weather watch the following day, but with the resources available, Bandelier managers believed preparations seemed an adequate response to the rapidly changing situation. Spot fires outside the designated boundary were contained on May 6, and blacklining continued. A meeting between the park and representatives of the Los Alamos National Laboratory, the U.S. Forest Service, and Los Alamos County addressed suppression strategy and tactics in the WFSA.¹⁹

As late as 11:00 a.m. on May 7, most spot fires appeared to be contained and the day began with optimism. At 2:30 a.m., the fire was tied to its anchor point at Route 4. Bandelier's next objective was to bring the blacklining fire across from east to west, but the wind blew downslope, exactly the wrong direction for such a goal. Even though Frijoles Canyon, choked with fuel according to one description, sat across the road, fire managers felt compelled to wait. The situation still seemed manageable. Just as officials felt that they had contained the fire, west winds dramatically increased and the fire spread into the adjacent Santa Fe National Forest. By noon, the fire had spread south of Route 4 into the Upper Frijoles Canyon drainage, burning with an intensity that made it impossible for the crews to attack it. The blaze turned into a crown fire, sending embers flying ahead that created spotting and crowning east of the prescribed fire zone. As this fire broke containment, a Type I incident management team was ordered. At 12:40 p.m., Gleason ordered the evacuation of Graduation Flats and American Springs; shortly after, all agencies in the area closed roads on their lands and evacuation procedures began.²⁰

¹⁷ Fire Investigation Team, National Interagency Fire Center, "Cerro Grande Prescribed Fire, May 4-8, 2000, Investigation Report, May 18, 2000," 12.

¹⁸ Carle, *Burning Questions*, 229.

¹⁹ Fire Investigation Team, National Interagency Fire Center, "Cerro Grande Prescribed Fire, May 4-8, 2000, Investigation Report, May 18, 2000," 12-13.

²⁰ Carle, *Burning Questions*, 230; Fire Investigation Team, National Interagency Fire Center, "Cerro Grande Prescribed Fire," May 4-8, 2000, Investigation Report, May 18, 2000, 13.

By 3 p.m., the situation had turned even more dangerous. East of the burn, watchers reported spot fires with the potential to threaten the town of Los Alamos and the laboratory installations. Even as two Type I crews successfully worked to contain the fires in Frijoles Canyon, a spot fire to the east of the prescribed burn area had grown to 100 acres and it had spotted an additional quarter of a mile up the road. In response, fire managers decided to burn sections between State Route 501 and the Camp May Road, Forest Road 1, in an effort to protect the town and the Los Alamos laboratory. Fire conditions were changing and so was the need for the response.²¹

That evening, the fire rapidly spiraled out of control. Even though crews contained the Frijoles Canyon spot fire, conditions rapidly worsened. A Type I team took charge of the fire at 6 a.m. on May 8, even as the fire ran across the east side of the mountain with flames of 100-150 feet in length. On May 9, the *Los Alamos Monitor*, the local newspaper, trumpeted a headline that read: “Wildfire! Worse Fears Become Reality for Los Alamos.” As the fire gained momentum, New Mexico Governor Gary Johnson ordered the evacuation of Los Alamos. Between 5 p.m. on May 10 and early Thursday morning May 11, fires burned across more than 20,000 acres. Two-hundred-and-thirty-nine homes were destroyed in Los Alamos. The fire then moved north in the direction of the San Ildefonso and Santa Clara Pueblo lands adjacent to the Los Alamos installation. Sixty-mile-per-hour winds made the fire devastating and dangerous. Before it was over, it destroyed thirty-nine Los Alamos National Laboratory office trailers and sheds. In a stroke of fortune, no radiation escaped nor was any toxic material released. By the time the fire was brought under control in early June, more than 400 families had been displaced, estimated damage costs exceeded \$1 billion, and the idea of prescribed burning faced another enormous challenge.²²

The Cerro Grande fire was hardly new in the annals of NPS fire management, but in terms of impact, it was the worst prescribed burn to go awry. While earlier prescribed burns had escaped or caused damage, the scope and scale of Cerro Grande’s damage far exceeded any prior escape. Worse, to the public and the press, Cerro Grande looked like a mistake in judgment. Sentiments in the nearby communities become intensely negative. Many openly excoriated the NPS. A few chose not to place blame. Among those who had seen their homes burn either in person or on television, a number remained sanguine about the result. Louis Jalbert, a waste handler at the Los Alamos National Laboratory who lost not only his family’s home, but lived next door to his in-laws, whose home was also destroyed in the fire, felt that the fire was an “act of nature in a tinderbox.” Expressing no bitterness as he talked to the *Los Alamos Monitor*, Jalbert still believed that prescribed burns were good policy.²³

Jalbert held a minority view. Most of the people affected by the fire were not so charitable toward the National Park Service. They felt that their trust had been abused, their safety compromised, and their lives put in danger to serve what they regarded as obscure purposes. Their view of the NPS and its fire program was harsh, and even the attempts at apology from the NPS were rebuked. “Based on what we knew at the time

²¹ Fire Investigation Team, National Interagency Fire Center, “Cerro Grande Prescribed Fire, May 4-8, 2000, Investigation Report,” May 18, 2000, 13.

²² Carle, *Burning Questions*, 231-32; Gil Reavill, “Meltdown in Los Alamos,” *Maxim* (October 2000).

²³ Sarah Meyer, “Victims Return to Scene of Disaster,” *Los Alamos Monitor* (May 16, 2000), 1.

and what we believed needed to be done,” Superintendent Roy Weaver of Bandelier National Monument told the *Monitor*, he made the decision to start the fire. The results had been devastating and people “had a right to be frustrated and angry.” The Los Alamos public articulated both anger and frustration in myriad ways.²⁴

The official response came quickly. On May 11, Secretary of the Interior Bruce Babbitt and Secretary of Agriculture Dan Glickman suspended all federal prescribed burning west of the 100th meridian, the line running from North Dakota through Texas, for thirty days. Babbitt formed an interagency fire team to examine the circumstances of the burn. One week later, on May 18, 2000, the investigation report was complete. It was devastating to the NPS fire program. Investigators determined that the prescribed fire plan was not adequate for the circumstances. The complexity rating process for the Cerro Grande area had been flawed. It did not follow the NPS rating system, nor had it been accurately rated. Later reports discerned that the fire management rating posted on the Internet when the Cerro Grande prescribed burn was planned was incorrect. The danger presented by the conditions at the time of the fire was not adequately understood, in the estimation of the investigation team, nor was interagency cooperation sufficient to assure a useful fire rating system. The investigators recommended that federal agencies should jointly develop interagency complexity rating standards by geographic region rather than to try to implement agency-wide standards. The review also determined the prescribed fire plan did not receive thorough review before approval by Superintendent Roy Weaver, and the prescribed fire planner did not receive sufficient support or oversight for the task of developing a plan for the prescribed fire.²⁵

The press response further deepened the problems for the National Park Service. The juxtaposition of plutonium and other radioactive materials with an intentionally ignited prescribed burn spurred many to the limits of journalistic license. “An out-of-control wildfire. A nuke factory with enough plutonium to wipe out the entire Southwest. A handful of exhausted firefighters,” the headline in *Maxim* magazine read in an overstated version of a widely asked question. “Just how close did we come to annihilation?”²⁶

The Cerro Grande fire represented the first time critics could point to clear NPS management mistakes as the cause of a major fire. Unlike Yellowstone in 1988 – when lightning was the genesis of the fires and the question of the nature of response led to the spread of fire, at Cerro Grande – the NPS simply erred. The prescribed fire had been set in less than optimal conditions, the Service lacked both adequate procedures and protocols for fire management, and the timing of the prescribed burn turned out to be poorly chosen. The attendant destruction of homes and Los Alamos National Laboratory structures compounded the problem. Not only did the initial decision reflect poorly on NPS judgment, the circumstances in which it occurred, near not only a town of more than 10,000 people, but adjacent to the remarkable and potentially devastating research facilities in Los Alamos made what might only have been an untimely decision look

²⁴ Ibid.

²⁵ Barry T. Hill, “Fire Management: Lessons Learned From the Cerro Grande (Los Alamos) Fire, Statement before the Committee on Energy and Natural Resources, United States Senate,” July 20, 2000, 1-15, Bandelier National Monument Files, Y-14; “Report Opposes Firing Workers for Los Alamos Blaze,” *USA Today* (June 20, 2001).

²⁶ Reavill, “Meltdown in Los Alamos.”

unwise if not downright irresponsible. The fire represented another watershed, one more way that politics and public relations grappled with science as the dominant mode of preparation and reaction to fire.

Cerro Grande set off more than immediate recriminations. The instantaneous reintroduction of suppression was the beginning of another rethinking not only of the NPS's fire policy, but of agencies throughout the federal system. Even more, the board of inquiry determined that of the four people with primary responsibility who remained in the National Park Service after the fire, three required more training. Whether intended as an indictment or not, such a judgment had the effect of calling into question NPS professionalism. While fire experts could feel that the judgment was easy after the fact, ongoing public acknowledgment of shortcomings did little to help NPS morale or solve the problems of fire management.²⁷

The blame mounted until Bandelier Superintendent Roy Weaver spoke out nearly one year after the blaze. Although Weaver had been blamed for the fire – vilified, castigated, and threatened with the loss of his pension in its aftermath – he was quiet until April 2001, when he publicly spoke out in defense of the staff of Bandelier National Monument. The board of inquiry's final report exonerated Weaver, but he believed the report did not go far enough. In the former superintendent's view, Bandelier had been “unfairly scapegoated” for the fire, he told reporter Keith Easthouse. Not only had the park not been warned of impending high winds on May 7 as had been reported, the federal report on the fire was so hastily completed that it did not give a fair accounting of the incident or its suppression. “I don't want to deny our responsibility for igniting the prescribed fire,” Weaver avowed. “But we did it with a plan that seemed valid and workable. Things happened that we couldn't or didn't anticipate. And that we couldn't control.”²⁸

This admission was as candid as it was clear. Simply put, fire could not easily be made to conform to bureaucratic measurements. It was always a risk, always a danger, whether it burned or it was suppressed. All the planning in the world could not obviate a disastrous change in weather or geographic conditions. Even the board of inquiry, critical in its stance toward the fire response team, recognized the limits of human response. “While the Board did find errors in judgment,” the report read, “it also finds that the planning and implementation actions of the principals were not arbitrary, capricious, or unreasonable in light of the information they had prior to the burn and were in compliance with DO-18, RM-18, and other applicable sections of the National Wildland fire policy.”²⁹ This tacit admission of limits in human response resulted from a century of experience.

By the middle of the first decade of the twenty-first century, little had been settled about the direction of fire policy in the United States. It was clear that fire had a role in the management of national parklands; even more telling, national park lands still enjoyed the special treatment they had always been accorded. The Healthy Forest Restoration Act of 2003 exempted the NPS from the timber cutting expected to reduce the impact of fire on national forest, Bureau of Land Management, and other federal

²⁷ Board of Inquiry, “Cerro Grande Prescribed Fire Final Report,” 49.

²⁸ Keith Easthouse, “Park Service Unfairly Scapegoated for Los Alamos Fire,” *Forest Magazine* (April 5, 2001); Board of Inquiry, “Cerro Grande Prescribed Fire Final Report,” 46.

²⁹ Board of Inquiry, “Cerro Grande Prescribed Fire Final Report,” 49.

lands.³⁰ Once again, the National Park Service's unique mission separated it from other federal agencies. While timber cutting could and did take place on NPS lands in limited ways, the purpose was decidedly different from the commercial extractive obligations of the legislation. As a result, although the new national fire plan in 2000 demanded a different response from the NPS, the Service could and did hew to a line more consistent with its overall mission and objectives.

At the same time, fire again took center stage. After Cerro Grande, a series of fires on federal lands further illustrated the problems of the existing regime. During 2002, two "monster fires," in Pyne's words, Hayman and Rodeo-Chediski, were the worst on record in Colorado and Arizona. The Biscuit fire in Oregon the same year was easily that state's worst since the nineteenth century. In 2003, southern California's mountains went up in flames. Fires burned across more than 740,000 acres, with twenty-two fatalities and more than 3,000 structures consumed. A new era seemed to dawn, what Pyne in a dramatic and even overblown phrase called "a crash in nature's economy as profound as in the stock market." The terms for fire management had to change throughout the federal system, but deciding what would replace the existing structure remained a complex process.³¹

Even in the aftermath of Cerro Grande, the National Park Service carved its own course in fire management. Once the NPS had followed other federal agencies; after 1968, it led. Yet, because of the difference in its mission and its objectives, particularly after the importance of resource management that was codified in the Redwood National Park Expansion Act of 1978, the NPS retained both the integrity and flexibility to administer its lands in accordance with its objectives. The result simultaneously kept the NPS within the fold of federal fire management while leaving enough room to manage its assets in accordance with the "preserve and make available for public enjoyment" tension that existed at the core of the NPS mission statement.

By the twenty-first century, the National Park Service had come far from its origins in fire suppression, reaching a position of respect as a fire management organization. A century earlier, fire management at places such as Yellowstone National Park had been what the U.S. Cavalry determined it to be – often vain efforts at suppression accomplished with whatever resources were at hand. By 2000, a multi-faceted bureaucracy oversaw fire management throughout the scattered dominion of the National Park Service. The NPS participated in interagency fire efforts, keeping a staff of forty-one at the National Interagency Fire Center in Boise, Idaho. In 2003, the NPS invested \$123,741,000 in fire management and another \$1,564,331,000 in Operation of National Park System (ONPS) funding. It managed 53,351,361 acres with the potential to burn among its more than 84 million acre domain. It had 434 permanent firefighters, seven regional management fire officers, two Type I Hot Shot crews and one smokejumping crew, as well as nine fire use modules. The NPS owned 155 fire engines, fourteen water/foam tenders, and nine fire helicopters. In 2003, the NPS spent \$21,191,000 to treat 22,523 acres of Wildland-Urban Interface lands laden with hazardous fuels. The Service spent an additional \$20,084,000 to treat another 115,104

³⁰ Congress, House, *Healthy Forests Restoration Act of 2003*, 108th Cong., 1st sess., HR 1904, 3 December 2003.

³¹ Stephen J. Pyne, *Tending Fire: Coping with America's Wildfires*, (Washington, D.C.: Island Press, 2004), 1-3.

acres containing hazardous fuels. This remarkable investment of funds and personnel created a comprehensive fire management program unequaled in the history of the National Park Service.³²

The change in attention paid to fire management reflected not only the changes in the National Park Service, but those of the twentieth century as well. The goals and standards of early fire suppression evolved into a management process measured by the highest scientific standards and aimed at achieving goals that were inconceivable at the 1916 inception of the NPS. The Army's initial emphasis on suppression in Yellowstone had been replaced by a systematic management structure that reflected improved technologies and better communications and the cutting edge of ecological science as well as specific NPS values. The greatest issues arose at the intersection of politics and scientific management, when either the ideals of policy were not applied with the clarity with which they were conceived or when even the best of policy fell short in a situation where wind-blown fire overwhelmed the structures and limitations of management. A longstanding policy of suppression made much land particularly vulnerable to the high fuel loads that drove fire of greater magnitude than would have occurred if a more natural regime had continued. Such situations became more common as people encroached on land with a propensity to burn even as the NPS and countless other federal agencies scrambled to treat the effects of nearly a century of fire suppression.

Twice national parks have led a national move to manage fires. In the first instance, when the U.S. Cavalry arrived at Yellowstone, the national parks became the incubator of the idea of national fire management, the place where the experiment to attempt to suppress fire in a systematic way took place. In the second instance, in the late 1960s, the NPS introduced the idea of using fire as tool, an idea that the Forest Service had buried in its enthusiasm for suppression early in the century. In this revolution in culture and practice, an overturning of an existing value system that paralleled a similar larger revolution in the United States, the NPS took the lead among federal agencies. Despite the difference in the NPS's mission, its values spread to its peer agencies and rewrote the rules of fire management.

By the early twenty-first century, the second heroic age of fire management was passing. The leaders who devised and instituted policies to use fire and then grappled with its consequences began to retire, supplanted by a generation that had never known a complete suppression regime or regarded fire as an enemy. As the people who had introduced fire to the national parks as a tool left the scene, they ceded the ground to this new cadre, who necessarily took the prerogative of using fire for granted. This simple change was a manifestation of the triumph of the fire management regime, testimony to its ability to overwhelm the model of suppression that preceded it.

Yet, the National Park Service's fire issues remained apart from those of other federal agencies at a time when interagency cooperation was not only desirable but an essential condition for an adequate response to fire. The unique mission of NPS among federal agencies, its mandate to preserve as well as use, made the particulars of its fire management more difficult. The Service contributed to interagency efforts in the same proportions as did other agencies, but used those resources in different and sometimes more complex ways. Its ability to implement fires to transform landscapes backward in

³² NPS Wildland Fire Fact Sheet, April 9, 2004, http://www.nps.gov/fire/download/uti_abo_wildlandfirefact.pdf.

time under the aegis of its resource management program allowed the NPS a measure of flexibility that advocates of the use of fire in other agencies envied.

In a larger setting, this advantage was negated. The western fire scene was “the sum of all we have done and not done over the past century; not only the logging, the grazing, and the road building, but the biosphere reserves, the wilderness areas, the recreational sites; the loss of old species, the invasion of new,” Pyne wrote in his 2004 summary of a career studying fire, *Tending Fire*. “The fires suppressed, the fires no longer set; the whole rearranged biota of the public domain,” he continued. “There is a good case to be made that policy of any sort can not function under that legacy.” Under such circumstances, the success of any fire policy might demand a faith in it that it did not merit. “Fire’s story is not wholly ours to narrate,” Pyne reminded his readers, and federal fire managers faced that fact in the early years of the twenty-first century.³³

For the National Park Service, the dilemma remained: how to get the right fires in the right places and keep the wrong fires out of the wrong areas. More complicated than either all-out suppression or prescribed fire in all its forms as implemented before 2000, this concern required even more of the National Park Service than any preceding philosophy. The Service’s mission simultaneously complicated its response to fire and shielded it from the sometimes narrow constraints in which other federal agencies functioned. Yet, after Outlet and Cerro Grande, the world would be different. After more than a century of dealing with fire in national parks, another new era began. In the twenty-first century, the National Park Service would again have to redefine the boundaries of its fire management strategy.

³³ Pyne, *Tending Fire*, 11-12.

Bibliography

- Abbott, Carl. *The Metropolitan Frontier: Cities in the Modern American West*. Tucson: University of Arizona Press, 1993.
- Ackerman, J. "Carrying the Torch." *Nature Conservancy* 43 (1993): 16-23.
- Adams, Charles. "Ecological Conditions in National Forest and in National Parks." *The Scientific Monthly* 20 (June 1925): 561-590.
- Agee, James K. *Fire Ecology of Pacific Northwest Forests*. Washington, D.C.: Island Press, 1993.
- _____. "Fire Management in the National Parks." *Western Wildlands* 1, no. 3 (1974): 27-33.
- _____. "Memorial Dedication to Dr. Harold H. Biswell." In *The Biswell Symposium: Fire Issues and Solutions in Urban Interface and Wildland Ecosystems, February 15-17, 1994*. USDA Forest Service General Technical Report PSW-GTR-158. Walnut Creek, California, Pacific Southwest Field Station (1995): 1-3.
- _____. "Perceptions and Professionals: Coming to Grips with Both." *Renewable Resources Journal*. 11, no. 1 (Spring 1993): 25-26. In special report "Workshop on National Parks Fire Policy: Goals, Perceptions, and Reality."
- Agee, J.K. and H.H. Biswell. "Debris Accumulation in a Ponderosa Pine Forest." *California Agriculture* 24, no. 5 (1970): 6-7.
- _____. "Seedling Survival in a Giant Sequoia Forest." *California Agriculture* 32, no. 4 (1969): 18-19.
- _____. "Some Effects of Thinning and Fertilization on Ponderosa Pine and Understory Vegetation." *Journal of Forestry* 68, no. 11 (1970): 709-711.
- Agee, J.K., R.H. Wakimoto and H.H. Biswell. "Fire and Fuel Dynamics of Sierra Nevada Conifers." *Forest Ecology and Management* 1 (1978): 255-265.
- Ahlgren, I.F. and C.E. Ahlgren. "Ecological Effects of Forest Fires." *The Botanical Review* 26 (1960): 483-533.
- Albright Horace M., as told to Robert Cahn. *The Birth of the National Park Service: The Founding Years, 1913-1933*. Salt Lake City: Howe Brothers Press, 1986.
- _____. and Marian Albright Schenk. *Creating the National Park Service: The Missing Years*. Norman: University of Oklahoma Press, 1999.
- Allen, Craig D., ed. "Fire Effects in Southwestern Forests." In *Proceedings of the Second La Mesa Fire Symposium 1996*. USDA Forest Service General Technical Report RM-286.
- Allen, C.D., R. Touchan, and T.W. Swetnam. "Landscape-Scale Fire History Studies Support Fire Management Action at Bandelier." *Park Science* 15, no. 13 (1995): 18-19.
- Anderson, M. Kat. "Tending the Wilderness." *Restoration & Management Notes* 14, no. 2 (Winter 1996): 154-166.
- Anderson, M. Kat, and Michael J. Moratto. "Native American Land-Use Practices and Ecological Impacts." In *Sierra Nevada Ecosystem project Final Report to Congress, Vol. II, Assessments and Scientific Basis for Management Options*. Davis: University of California, Centers for Water and Wildland Resources, 1996.

- Arno, Stephen F. "Forest Fire History in the Northern Rockies." *Journal of Forestry* (August 1980): 460-465.
- _____. "History of Fire Occurrence in Western North America." *Renewable Resources Journal* 11, no. 1 (Spring 1993): 12-13. In special report: "National Parks Fire Policy: Goals, Perceptions and Reality."
- _____. "The Seminal Importance of Fire in Ecosystem Management—Impetus for This Publication." In *The Use of Fire in Forest Restoration*, General Technical Report INT-GTR-341. USDA, Forest Service, Intermountain Research Station. June 1996.
- _____. "Eighty-eight Years of Change in a Managed Ponderosa Pine Forest." General Technical Report RMRS-GTR-23. USDA, Forest Service, Intermountain Research Station. March 1999.
- Arno, S.F. and S. Allison-Bunnell. "Managing Fire-Prone Forests: Roots of Our Dilemma." *Fire Management Today* 63:12-16.
- Arno, S.F. and S. Allison-Bunnell. *Flames in Our Forest: Disaster or Renewal?* Washington, D.C.: Island Press, 2002.
- Arno, S.F. and C.C. Hardy. "The Use of Fire in Forest Restoration." In *The Use of Fire in Forest Restoration, 1996*. USDA Forest Service Intermountain Research Station General Technical Report INT-GTR-341.
- Babbitt, Bruce. "Fight Fire With Fire." Address to Commonwealth Club, San Francisco, California. September 1, 1998. Online: <http://www.wildfirenews.com/fire/articles/babbitt.html>
- _____. "Making Peace with Wildland Fire." *Wildfire* 8 (January 1999): 12-17.
- Babbitt, Bruce, and Dan Glickman. "Managing the Impact of Wildfires on Communities and the Environment: A Report to the President in Response to the Wildfires of 2000." September 8, 2000. Online: <http://www.whitehouse.gov/CEQ/fireport.html>
- Bancroft, Larry, Thomas Nichols, David Parson, David Graber, Boyd Evison and Jan van Wagtenonk. "Evolution of the National Fire Management Program at Sequoia and Kings Canyon National Parks." Paper presented at the Wilderness Fire Symposium, Missoula, Montana (November 15-18, 1983): 174-180.
- Barbee, Robert D. "Replies from the Fire Gods." *American Forests* (March/April 1990): 34-35, 70.
- Barker, Rocky. *Scorched Earth: How Fires in Yellowstone Changed America*. Washington, DC: Island Press, 2005.
- Barro, S.C., and S.G. Conrad. "Fire Effects on California Chaparral Systems: An Overview." *Environment International* 76 (1991): 135-149.
- Barrett, Louis A. *Record of Forest and Field Fires in California*. USDA Forest Service, California Region. San Francisco, 1935.
- Barry, W. James, and R. Wayne Harrison. "Prescribed Burning in the California state Park System." Presented at the Symposium on fire in California Ecosystems: Integrating Ecology, Prevention, and Management, San Diego, California, November 17-20, 1997.
- Baskin, Yvonne. "Yellowstone Fires: A Decade Later; Ecological Lessons Learned in the Wake of the Conflagration." *BioScience* (February 1999).
- Baumgartner, David M., et al., eds. *Prescribed Fire in the Intermountain Region*. Pullman, WA: Washington State University, 1989.

- Biswell, Harold. "The Big Trees and Fire." *National Parks Magazine*, April 11-14, 1961.
- _____. "Danger of Wildfires Reduced in Ponderosa Pine." *California Agriculture* 4, no. 10 (1960): 5-6.
- _____. "Fire Ecology in Ponderosa Pine-Grassland." In *Proceedings, Annual Tall Timbers Fire Ecology Conference, June 8-9, 1971*, 69-96. Tallahassee, FL: Tall Timbers Research Station, 1972.
- _____. "Forest Fire in Perspective." 7. In *Proceedings from the California Tall Timbers Fire Ecology Conference*. (Nov. 9-10, 1967): 43-63.
- _____. "Litter Production." *California Agriculture*. 20 (1966): 5-7.
- _____. "Man and Fire in Ponderosa Pine." *Sierra Club Bulletin* 44, no. 7 (1959): 44-53.
- _____. *Prescribed Burning in California Wildlands Vegetation Management*. Berkeley: University of California Press, 1989.
- _____. "Prescribed Burning in Georgia and California Compared." *Journal of Range Management* 11, no. 6 (1958): 293-298.
- _____. "Prescribed Fire as a Management Tool." Paper presented at the Symposium on Environmental Consequences of Fire and Fuel Management in Mediterranean Ecosystems. Palo Alto, California, August 1-5, 1977.
- _____. "Reduction of Wildfire Hazard." *California Agriculture* 13, no. 6 (1959): 5.
- _____. "Research in Wildland Fire Ecology in California." In *Proceedings, 1st Tall Timbers Fire Ecology Conference, March 1-2, 1962*, 63-97. Tallahassee, FL: Tall Timbers Research Station, 1963.
- _____. "The Role of Fire in Maintaining Forest Wilderness Quality." Paper presented at the Second Annual California Plant and Soil Conference, California Chapter, American Society of Agronomy, February 1, 1973.
- _____. "The Use of Fire in Wildland Management." In *Natural Resources, Quality and Quantity*, edited by S.V. Wangtrup and James J. Parsons. Berkeley: University of California Press, 1967.
- _____. "Some Aspects of Simulated Natural Fires in Vegetation Management." Session introductory comments, .Society for Range Management. Omaha, Nebraska. February 19, 1976.
- _____. "Fire Ecology: Past, Present, and Future." Keynote talk to the Ecology Section, American Association for the Advancement of Science, Davis, California, June 23, 1980.
- _____. *Prescribed Burning in California Wildlands Vegetation Management*. Berkeley: University of California Press, 1999.
- Biswell, Harold H., Harry R. Kallander, Roy Komarek, Richard J. Vogl, and Harold Weaver. "Ponderosa Fire Management. Miscellaneous Publication No. 2." Tallahassee, FL: Tall Timbers Research Station, 1973.
- Biswell, Harold, and Harold Weaver. "Redwood Mountain." *American Forests* 74 (1968): 20-23.
- Blumer, J.C. "Fire as a Biological Factor." *Plant World* 13 (1910): 42-44.
- Bock, J.H. and C.E. Bock. "Natural Reforestation in the Sierra Nevada-Donner Ridge Burn." 9. In *Proceedings from the Annual Tall Timbers Fire Ecology Conference*. (Apr. 10-11, 1969): 119-126.
- Boerker, Richard H. "Light Burning Versus Forest Management in Northern California." *Journal of Forestry* 10 (1912): 184-194.

- Bolgiano, Chris. "Yellowstone and the Let-Burn Policy." *American Forests* (January/February 1989): 22-25, 74-78.
- Bond, W.J. and B.W. van Wilgen. *Fire and Plants*. London: Chapman & Hall, 1996.
- Bonnicksen, Thomas M. "Fire Gods and Federal Policy." *American Forests* (July/August 1989): 14-16, 66-68.
- _____. *America's Ancient Forest: From the Ice Age to the Age of Discovery*. New York: John Wiley, 2000.
- Botti, S.J. "Funding Fuels Management in the National Park Service: Costs and Benefits." In D.R. Weise and R.E. Martin eds. *Biswell Symposium: Fire Issues and Solutions in Urban Interface and Wildland Ecosystems, 15-17 February 1994, Walnut Creek, California*. USDA Forest Service General Technical Report PSW-GTR-158.
- _____. "The National Park Service Wildland Fire Management Program." In A. Gonzalez-Caban and P.N. Omi. eds. *Proceedings of the Symposium on Fire Economics, Planning, and Policy: Bottom Lines. April 5-9, 1999 San Diego, California*. USDA Forest Service Pacific Southwest Research Station PSW-GTR-173.
- Botti, S.J. and H.T. Nichols. "Availability of Fire Resources and Funding for Prescribed Natural Fire Programs." In J.K. Brown, R.W. Mutch, C.W. Spoon, R.H. Wakimoto, eds. *Proceedings: Symposium on Fire in Wilderness and Park Management, 30 March-1 April 1993, Missoula, Montana*. USDA Forest Service General Technical Report INT-GTR-320.
- Botti, S.J., P.N. Omi and D.B. Rideout. "An Analytical Approach for Assessing Cost Effectiveness of Landscape Prescribed Fires." In A. Gonzalez-Caban and P.N. Omi. eds. *Proceedings of the Symposium on Fire Economics, Planning, and Policy: Bottom Lines. April 5-9, 1999 San Diego, California*. USDA Forest Service Pacific Southwest Research Station PSW-GTR-173.
- Boyd, Robert. *Indians, Fire and the Land in the Pacific Northwest*. Corvallis, OR: Oregon State University Press, 1999.
- Bradley, C.B. "Some Problems Relating to Big Trees." *American Forests* 77 (1971): 29-31.
- Brennan, Leonard A., and Sharon M. Hermann. "Prescribed Fire and Forest Pests: Solutions for Today and Tomorrow." *Journal of Forestry* (November 1994): 34-36.
- Brown, Arthur A. and Kenneth P. Davis. *Forest Fire: Control and Use*, 2nd edition. New York: McGraw-Hill, 1973.
- Brown, James K., et. al. *Proceedings: Fire in Wilderness and Parks Symposium, 1995*. USDA Forest Service General Technical Report INT-GTR-320.
- Bruce, Donald. "Light-Burning-Report of the California Forestry Committee." *Journal of Forestry* 21 (1928): 129-133.
- Butler, Mary Ellen. *Prophet of the Parks, The Story of William Penn Mott, Jr.* Ashburn, VA: National Recreation and Park Association, 1999.
- Cammerer, Arno B. "Outdoor Recreation-Gone with the Flames." *American Forest* April (1939): 182.
- Caprio, Anthony C., and David M. Graber. "Returning Fire to the Mountains: Can We Successfully Restore the Ecological Role of Pre-Euroamerican Fire Regimes to

- the Sierra Nevada?" In David N. Cole and Stephen F. McCool, *Proceedings: Wilderness Science in a Time of Change*. Proc. RMRS-P-000. USDA, Forest Service, Rocky Mountain Research Station. Ogden, Utah, 2000.
- Carle, David. *Burning Questions: America's Fight with Nature's Fire*. Westport, CT: Praeger, 2002.
- Carr, Ethan. *Wilderness By Design: Landscape Architecture and the National Park Service*. Lincoln: University of Nebraska Press, 1998.
- Cermak, Robert W. "Fire Control in the National Forests of California, 1898-1920." Master's thesis, California State University, Chico, 1986.
- "Cerro Grande ... Facing the Flames." Cerro Grande Fire Special Edition. *Los Alamos Monitor*, June 18, 2000.
- Chandler, Craig et al. *Fire in Forestry*, 2 vols. New York: Wiley, 1983.
- Chapman, H.H. "Editorials: Fire-Master or Servant." *Journal of Forestry* 37 (1931): 605.
- _____. "Some Further Relations of Fire to Longleaf Pine." *Journal of Forestry* 30 (1932): 602-604.
- _____. "Fires and Pines ... A Realistic Appraisal of the Role of Fire in Reproducing and Growing Southern Pines." *American Forests* 50 (1944): 62-64.
- _____. "Forest Fires and Forestry in the Southern States." *American Forests* 18 (1912): 510-517.
- _____. "Prescribed Burning Versus Public Forest Fire Services." *Journal of Forestry* 45 (1947): 804-808.
- _____. "Prescribed Burning in the Loblolly Pine Type." Exchange of letters with William L. Hall. *Journal of Forestry* 45 (1947): 209-212.
- _____. "To Whom it May Concern." *American Forests* 62, no. 8 (August 1956): 54-55.
- Chapman, H.H., and H.N. Wheeler. "Controlled Burning." *Journal of Forestry* 39 (1941): 886-891.
- Christensen, N.L., L. Cotton, T. Harvey, R. Martin, J. McBride, P. Rundel, and R. Wakimoto. "Review of Fire Management Program for Sequoia-Mixed Conifer Forests of Yosemite, Sequoia and Kings Canyon National Parks." Final report to National Park Service. Washington, D.C., 1987.
- Christensen, Norman L., James K. Agee, Peter F. Brussard, Jay Hughes, Dennis H. Knight, G. Wayne Minshall, James M. Peek, Stephen J. Pyne, Frederick J. Swanson, Jack Ward Thomas, Stephen Wells, Stephen E. Williams and Henry A. Wright. "Interpreting the Yellowstone Fires of 1988." *BioScience* 39, no. 10 (November 1989): 678-685.
- Clairborne, R. "Can There Be a 'Good' Forest Fire?" *Smithsonian* (May 1972).
- Clark, J.S. "The Forest is for Burning." *Natural History* (January 1989): 51-53.
- Clar, C. Raymond. *California Government and Forestry: From Spanish Days until the Creation of the Department of Natural Resources in 1927*. Sacramento: California State Board of Forestry, 1959.
- _____. "The Development of a Forest Fire Protection System in the California Division of Forestry, 1930-42." An interview by Mrs. Amelia Fry. Regional Oral History Office, Berkeley, University of California, May 29, 1966.
- Cohen, Jack D. "Why Los Alamos Burned." *Forest Magazine*. 2000.
- _____. "Reducing the Wildland Fire Threat to Homes: Where and How Much?" In *Symposium on Fire Economics, Policy, and Planning: Bottom Lines, April 5-9*

- 1999, San Diego, California. USDA Forest Service General Technical Report PSW-GTR-173.
- Coman, Warren E. "Did the Indian Protect the Forest?" *Pacific Monthly* 26, no. 3 (September 1911): 300-309.
- Conarro, R.M. "Fighting Tomorrow's Fires Today." *American Forests* (April 1939): 214.
- Cooper, C.F. "Changes in Vegetation, Structure, and Growth of Southwestern Pine Forest Since White Settlement." *Ecological Monographs* 30:129: 164.
- _____. "The Ecology of Fire." *Scientific American* (April 1961).
- Covington, W. Wallace. "Ponderosa Ecosystem Restoration Institute, Northern Arizona University School of Forestry, 1999. Online:
<http://www.eri.nau.edu/cov99vfn.html>
- Cowles, Raymond B. "Starving the Condor." *California Fish and Game* 44 (1958): 175-181.
- _____. "Fire Suppression, Faunal Changes and Condor Diets." In *Proceedings, Tall Timbers Fire Ecology no. 7: 217-224*. Tallahassee, FL: Tall Timbers Research Station, 1967.
- Crosby, Alfred W. *Ecological Imperialism: The Biological Expansion of Europe, 900-1900 A.D.* New York: Cambridge University Press, 1986.
- Crosby, Bill. "Our Wild Fire: History Shows that Nearly All of California Is Designed to Burn." *Sunset* (June 1992): 64-72.
- Crutzen, P.G., and J.G. Goldammer, eds. *Fire in the Environment: Its Ecological, Climatic, and Atmospheric Chemical Importance*. New York: Wiley, 1993.
- Dana, Samuel T. *Forest and Range Policy: Its Development in the United States*. New York: McGraw Hill, 1956.
- Daniels, Orville L. "Test of a New Land Management Concept: Fritz Creek 1973." *Western Wildlands* 1, no. 3 (1974): 23-26.
- _____. "Fire Management Takes Commitment." In *Proceedings, Tall Timbers Fire Ecology Conference and Fire and Land Management Symposium, October 8-10, 1974*. Tallahassee, FL: Tall Timbers Research Station, 1976.
- _____. "A Forest Supervisor's Perspective on the Prescribed Natural Fire Program." In *Proceedings, 17th Tall Timbers Fire Ecology Conference, May 18-21, 1989. High Intensity Fire in Wildlands*. Tallahassee FL: Tall Timbers Research Station, 1989.
- David, Tony. "The West's Hottest Question: How to Burn What's Bound to Burn." *High Country News* 32, no. 11, June 5, 2000.
- Davis, James B., and Robert E. Martin eds. *Proceedings of the Symposium on Wildland Fire 2000*. USDA Forest Service General Technical Report PSW-101.
- Davis, Mike. *Ecology of Fear: Los Angeles and the Imagination of Disaster*. New York: Metropolitan Books, 1998.
- Dawson, Kerry J., and Steven E. Grego. "The Visual Ecology of Prescribed Fire in Sequoia National Park." In *Proceedings of the Symposium on Giant Sequoias: Their Place in the Ecosystem and Society, June 23-25, 1992*. Visalia, California. USDA Forest Service Gel Tech Rep. PSW-151: 99-107, 1994.
- DeBuys, William "Los Alamos Fire Offers a Lesson in Humility." *High Country News*. 32, no. 13, (July 3, 2000).
- "A Defense of Forest Fires." *Literary Digest*. August 9, 1913.
- Demmon, E.L. "Fires and Forest Growth." *American Forests* 35 (April 1929).

- Despain, D. *Yellowstone Vegetation: Consequences of Environment and History in a Natural Setting*. Boulder, Co: Roberts Rinehart, 1990.
- _____. A. Rodman, P. Schullery, and H. Schovic. "Burned Area Survey of Yellowstone National Park." In *The Fires of 1988*. Division of Research and Geographic Information Systems Laboratory, Yellowstone National Park, 1989.
- _____. ed. "Plants and Their Environments." *Proceedings of the First Scientific Conference on the Greater Yellowstone Ecosystem*. Technical Report NPS/NRYELL/NRTR, 1994.
- Despain, Don G., and William H. Romme. "Ecology and Management of High-Intensity Fires in Yellowstone National Park." In *Proceedings, 17th Tall Timbers Fire Ecology Conference, May 18-21, 1989. High Intensity Fire in Wildlands*. Tallahassee, FL: Tall Timbers Research Station, 43-57.
- _____. "Historical Perspective on the Yellowstone Fires of 1988." *BioScience* 32 (1982): 695-699.
- Devlin, Sherry. "Check with Reality: Intense Blazes of 2000 May Be Wake-up Call to Return Fire to Forests." *The Missoulian*. August 22, 2000, Missoula, Montana. Online at: http://www.fs.fed.us/rm/main/pa/newsclips/00_08/082200_reality.html
- Doxey, Wall. "Fire or Forestry-The South's Great Problem." By Representative from Congress from Mississippi. *American Forests* (April 1939): 161.
- DuBois, Coert. *Systematic Fire Protection in the California Forests*. USDA, Forest Service, Washington, D.C.: Government Printing Office, 1914.
- _____. "Cooperative Brush-Burning in the California National Forests." Draft circular, 95-97-03, Box 23 (27837) "Fire, Coop. 1915-23." NARA, San Bruno, California, 1915.
- Easthouse, Keith. "Los Alamos Inferno: Los Alamos National Laboratory Has Long Played with Nuclear Fire. But Can It Handle a Forest Fire?" *Forest Magazine* (September/October 1999). Online at: <http://www.forestmag.org/losalamosfire.htm>
- Elfring, Chris. "Yellowstone: Fire Storm over Fire Management." *BioScience*. 39, no. 10 (November 1989): 667-672.
- Evans, C.F. "Can the South Conquer the Fire Scourge?" *American Forestry* 50 (May 1944): 227-229.
- Everhart, William C. *The National Park Service*. Boulder, CO: Westview Press, 183.
- "The Father of Smokey Bear Speaks." *Forest Log* (September-October 1994): 14-17.
- "The Fire Next Time." *Time* (August 7, 1972): 48-49.
- Foresta, Ronald. *America's National Parks and Their Keepers*. Washington, D.C.: Resources for the Future, 1983.
- Flader, S.L. and J.B. Callicott eds. *The River of the Mother of God and Other Essays by Aldo Leopold*. Madison, WI: University of Wisconsin Press, 1991.
- Floyd, Donald W. *Forest Sustainability: The History, the Challenge, the Promise*. Durham, NC: Forest History Society, 2002.
- Folweiler, A.D. "The Place of Fire in Southern Silviculture." *Journal of Forestry* 50 (1952): 187-190.
- Franke, Mary Ann. *Yellowstone in the Afterglow: Lessons from the Fires*. Mammoth Hot Springs, WY: Yellowstone Center for Resources, Yellowstone National Park, 2000.

- Gabrielson, Ira N. "Burning Wildlife." *American Forests* (April 1939): 186.
- Gannett, Henry, ed. "Report of the National Conservation Commission, February, 1909; Special Message from the President of the United States." Washington, D.C.: Government Printing Office, 1909.
- Gantenbein, Douglas. *A Season of Fire: Four Months on the Firelines of the American West*. New York: Jeremy P. Tarcher/Penguin, 2003.
- Gillette, Charles A. "Campaigning Against Forest Fires." *American Forests* (April 1931): 209, 256.
- Goudsblom, Johan. *Fire and Civilization*. New York: Penguin Press, 1992.
- Graber, D.M. "Coevolution of National Park Service Fire Policy and the Role of National Parks." In J.F. Lotan, B.M. Kilgore, W.C. Fischer, and R.F. Mutch, eds. *Proceedings Symposium and Workshop on Wilderness Fire. 15-18 November 1983, Missoula, Montana*. USDA Forest Service General Technical Report INT-182.
- Graber, D.M. and D.P. Parsons. "Twenty-Six Years of Prescribed Fire Management in Sequoia and Kings Canyon National Parks: What Has Been Accomplished in Restoring Fire and its Effects?" In Leonard A. Brennan and Teresa L. Pruden, eds. *Fire in Ecosystem Management: Shifting the Paradigm from Suppression to Prescription. Proceedings of the Tall Timbers Fire Ecology Conference, No. 20*. Tall Timbers Research Station, Tallahassee, FL. 1998.
- Graves, Henry S. *Protection of Forests from Fire*. U.S. Department of Agriculture, Forest Service, Bulletin No. 82. Washington, D.C.: Government Printing Office, 1910.
- _____. "The Forest Service and Light-Burning Experiments." *American Lumberman* 2337 (February 1928): 76-77.
- _____. "Graves Terms Light Burning 'Paiute Forestry'". *The Timberman* (January 1920): 35.
- _____. "National Forests and National Parks in Wildlife Conservation." Proceedings of the National Parks Conference. Washington, D.C.: Government Printing Office, 1917.
- _____. "D-5, Fire Cooperation Brush Burning." Letter to Coert duBois. 95-97-03, Box 23 "Fire, Coop. 1915-1923." NARA, San Bruno, California, January 24, 1918.
- _____. "The Torch in the Timber: It May Save the Lumberman's Property, But It Destroys the Forests of the Future." *Sunset, The Pacific Monthly* 44 (April 1920): 37-40, 80-90.
- Graves, Walter L., and Gary Reece. "The Legacy of Harold Biswell in Southern California: His Teaching Influence on the Use of Prescribed Fire." USDA Forest Service Gen. Tech. Rep. PSW-GTR-158. First presented at the Biswell Symposium: Fire Issues and Solution in Urban Interface and Wildland Ecosystems, February 15-27, 1994, Walnut Creek, California, 1995.
- Green, Lisle R. *Burning by Prescription in Chaparral*. PSW-51. USDA-Pacific Southwest Forest and Range Experiment Station, Berkeley, California, May 1981.
- Green, S.W. "The Forests that Fire Made." *American Forests* 37 (1931): 583-584, 618.
- Greeley, W.B. "'Piute Forestry' of the Fallacy of Light Burning." *The Timberman* (March 1920): 38-39.

- Gruell, George E. "Indian Fires in the Interior West: A Widespread Influence," 68-74. Presented at the Wilderness Fire Symposium, Missoula, Montana, November 15-18, 1983.
- _____. "A Prerequisite for Better Public Understanding of Fire Management Challenges," 25-38. In *Proceedings, 17th Tall Timbers Conference, May 21, 1989. High Intensity Fire in Wildlands*. Tallahassee, FL: Tall Timbers Research Station, 1989.
- _____. *Fire in Sierra Nevada Forests: A Photographic Interpretation of Ecological Change Since 1849*. Missoula, MT: Mountain Press Publishing Company, 2001.
- Guth, A. Richard, and Stan B. Cohen. *Red Skies of '88*. Missoula, MT: Pictorial Histories Publishing Co., 1989.
- Haggerty, P.K. "Fire Effects in Blue Oak Woodland." In *Proceedings of the Symposium on Oak Woodlands and Hardwood Rangeland Management, 1991*. USDA Forest Service PSWFRES General Technical Report PSW-126.
- Halvorson, William L. and Gary E. Davis. *Science and Ecosystem Management in the National Parks*. Tucson: University of Arizona Press, 1996.
- Hampton, H. Duane. *How the U.S. Cavalry Saved Our National Parks*. Bloomington: Indiana University Press, 1971.
- Hanson, Chad. "The Big Lie: Logging and Forest Fires." *Earth Island Journal* 15, no 1 (Spring 2000).
- Harper, Roland M. "A Defense of Forest Fires." *Literary Digest* (August 1913): 9.
- Harrison, Robert Pogue. *Forests: The Shadow of Civilization*. Chicago: University of Chicago Press, 1992.
- Hartesveldt, R.J. "Fire Ecology of the Giant Sequoia: Controlled Fires May Be One Solution to the Survival of the Species." *Natural History Magazine* 73 (1964), 12-19.
- Hartesveldt, R.J. and H.T. Harvey. "The Fire Ecology of Sequoia Regeneration." 7. In *Proceedings from the Tall Timbers Fire Ecology Conference*. (Nov. 9-10, 1967): 64-78.
- _____. "Sequoia's Dependence on Fire." *Science* 166 (1969): 552-553.
- Hartzog, George B., Jr. *Battling for the National Parks*. Mt. Kisco, NY: Moyer Bell Publishing, 1988.
- Hays, Samuel P. *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890-1920*. Cambridge, MA: Harvard University Press, 1959.
- _____. *Beauty, Health, and Permanence: Environmental Politics in the United States, 1955-1985*. Cambridge: Cambridge University Press, 1987.
- _____. *A History of Environmental Politics Since 1945*. Pittsburgh: University of Pittsburgh Press, 2000.
- Hazen, Margaret Hindle and Robert M. Hazen. *Keepers of the Flame: The Role of Fire in American Culture 1775-1925*. Princeton, NJ: Princeton University Press, 1992.
- Heady, H.F. "Burning and the Grasslands in California." 12. In *Proceedings of the Tall Timbers Fire Ecology Conference* (1973): 97-107.
- Heinrichs, Jay. "The Ursine Gladhander." *Journal of Forestry* (October 1982): 642.
- Heinselman, M.L. "Preserving Nature in Forested Wilderness Areas and National Parks." *National Parks & Conservation Magazine* 44 (1970): 8-14.

- Hensel, R.I. "Recent Studies on the Effect of Burning on Grassland Vegetation." *Ecology* 4 (1923): 183-188.
- Hester, Eugene. "The Evolution of Park Service Fire Policy." *Renewable Resources Journal* 11, no. 1 (Spring 1993): 14-15. In Special Report: "Workshop on National Parks Fire Policy: Goals, Perceptions, and Reality."
- Heyward, Jr., Frank. "History of Forest Fires in the South." *Forest Farmer* 9 no. 8 (1950): 3, 10-11.
- Hill, Barry T. *Western National Forests- A Cohesive Strategy is Needed to Address Catastrophic Wildfire Threats*. GAO-RCED-99-65. Washington, D.C.: General Accounting Office, 1999.
- _____. *Fire Management, Lessons Learned from the Cerro Grande (Los Alamos) Fire*, GAO/T-RCED-00-257 Washington, D.C.: General Accounting Office, 2000.
- Holbrook, Stewart H. *Burning an Empire: The Story of American Forest Fires*. New York: Macmillan Company, 1942.
- Hoxie, George L. "How Fire Helps Forestry: The Practical vs. the Federal Government's Theoretical Ideas." *Sunset* 34 (August 1910): 145-151.
- Huggard, Christopher J. and Arthur R. Gomez eds. *Forests Under Fire: A Century of Ecosystem Mismanagement in the Southwest*. Tucson: University of Arizona Press, 2001.
- Hurley, Harry. "Prescribed Burning in the 21st Century." USDA Forest Service GEN. Tech. Rep. PSW-GTR-158. 1995. Abbreviated version presented at the "Biswell Symposium: Fire Issues and Solutions in Urban Interface and Wildland Ecosystems," Walnut Creek, California, February 15-17, 1994.
- International Association of Wildland Fire. *Bibliography of Wildland Fire*. IAWF, 1996.
- Ise, John. *Our National Park Policy: A Critical History*. Baltimore: Johns Hopkins University Press, 1961.
- Jenks, Cameron. *The Development of Government Forest Control in the United States*. Baltimore, MD: Johns Hopkins Press, 1928.
- Jepson, W.L. "The Fire-Type Forest of the Sierra Nevada." *The Intercollegiate Forestry Club Annual* 1, no. 1 (1921): 7-10.
- Johnson, K. Norman, John Sessions, Jerry Franklin, and John Gabriel. "Integrating Wildfire into Strategic Planning in Sierra Nevada Forests." *Journal of Forestry* (January 1998): 42-49.
- Johnson, Von J. "Prescribed Burning: Requiem or Renaissance?" *Journal of Forestry* 82, no. 2 (1984): 82-90.
- Kay, Charles E. "Aboriginal Overkill and Native Burning: Implications for Modern Ecosystem Management." Online:
<http://wings.buffalo.edu/academic/departments/anthropology/documents/burning>
- Keeley, J. "Fire and Invasive Plants in California Ecosystems." *Fire Management Today* 63: 18-19.
- Keifer, Mary Beth. "Fuel Load and Tree Density Changes Following Prescribed Fire in the Giant Sequoia-mixed Conifer Forest: The First 14 Years of Fire Effects Monitoring, 306-309. In *Tall Timbers Fire Ecology Conference 20th Proceedings, Fire in Ecosystem Management: Shifting the Paradigm from Suppression to Prescription*. Tallahassee, FL: Tall Timbers Research Station, 1998.

- Keller Robert H. and Michael F. Turek. *American Indians and National Parks*. Tucson: University of Arizona Press, 1998.
- Kennedy, Roger. "Fires Illuminate Our Illusions in the Southwest." *High Country News* 32, no. 13, July 3, 2000.
- Kerscher, J.R. and M.C. Axelrod. "A Process Model of Fire Ecology and Succession in a Mixed-Conifer Forest." *Ecology* 65 (1984): 1735-1742.
- Kilgore, Bruce. "The Ecological Role of Fire in Sierra Conifer Forests; Its Application to National Park Management." *Quaternary Research* 3 (1973): 496-513.
- _____. "Fire in Ecosystem Distribution and Structure: Western Forests and Shrublands." In *Fire Regimes and Ecosystem Properties 1981*. USDA Forest Service General Technical Report GTR-WO-26.
- _____. "From Fire Control to Fire Management; An Ecological Basis for Policies." In *Transactions North American Wildlife and Natural Conferences* 41 (1976): 477-473.
- _____. "Fire Management in the National Parks: An Overview," 14. In *Tall Timbers Fire Ecology Conference*. (October 8-10, 1976) 45-57. Missoula, Montana.
- _____. "Integrated Fire Management in National Parks." In *Proceedings of 1975 National Convention, Society of American Foresters* (1976): 178-188.
- _____. "Introduction – Fire Management Section," Tall Timbers Fire Ecology Conference. (October 8-10, 1974): 7-9. Missoula, Montana.
- _____. "Research Needed for an Action Program of Restoring Fire to Giant Sequoias." *Intermountain Fire Research Council Symposium on "The Role of Fire in the Intermountain West."* (1970): 172-180.
- _____. "Restoring Fire to High Elevation Forests in California." *Journal of Forestry* 70 (1972): 266-271.
- _____. "Restoring Fire to National Park Wilderness." *American Forests* (1975): 16-19, 57-59.
- _____. "Restoring Fire to the Sequoias." *National Parks & Conservation Magazine* 44 (1970): 16-22.
- _____. "The Role of Fire in a Giant Sequoia-Mixed Conifer Forest." *Research in Parks* (1971): 93-116.
- Kilgore, Bruce, and H.H. Biswell. "Seedling Germination Following Fire in a Giant Sequoia Forest." *California Agriculture* 25 (February 1971): 8-10.
- Kitts, Joseph A. "Preventing Forest Fires by Burning Litter." *The Timberman* (July 1919): 91.
- _____. "Forest Destruction Prevented by Control of Surface Fires." *American Forestry* 25 (1919): 1284-1306.
- Knight, D.H. "Parasites, Lightning, and the Vegetation Mosaic in Wilderness Landscapes." In M.G. Turner, ed. *Landscape Heterogeneity and Disturbance*. New York: Springer-Verlag, 1987.
- _____, and L. Wallace. "The Yellowstone Fires: Issues in Landscape Ecology." *BioScience* 39 (1989): 700-706.
- _____. "The Yellowstone Fire Controversy." In R. Keiter and M. Boyce eds., *The Greater Yellowstone Ecosystem: Redefining America's Wilderness Heritage*. New Haven: Yale University Press, 1991.

- _____. *Mountains and Plains: The Ecology of Wyoming Landscapes*. New Haven: Yale University Press, 1994.
- _____, and W.H. Romme. "Landscape Diversity: The Concept Applied to Yellowstone Park." *BioScience* 32 (1982): 664-670.
- Knudsen, T. "Feeding the Flame." *The Sacramento Bee: Special Report* November 27-December 1, 1994.
- Koch, Elers. "The Passing of the Lolo Trail." *Journal of Forestry* 33 (1935): 98-104.
- Koehler, Matthew. "The Truth About Logging and Wildfire Prevention." Wild Rockies Organization. Online: <http://www.wildrockies.org/wildfire/>
- Komarek, E.V. "The Use of Fire: An Historical Background," 7. In *Proceeding First Annual Tall Timbers Fire Ecology Conference*. Tallahassee, FL: Tall Timbers Research Institute, 1962.
- _____. "Comments on the History of Controlled Burning in the Southern United States." In *Proceedings, 17th Annual Arizona Watershed Symposium*. Arizona Water Commission Report No. 5, Phoenix, Arizona, September 19, 1973.
- _____. "A Quest for Ecological Understanding: The Secretary's Review, March 15, 1958-June 30, 1975." Miscellaneous Publications No. 5. Tallahassee, Florida, Tall Timbers Research Station, 1977.
- _____. "Reflections by E.V. Komarek, Sr.," 31. In *Proceeding, 17th Tall Timbers Fire Ecology Conference, May 18-21, 1989*.
- _____. "High Intensity Fire in Wildland Management, Challenges and Options." Tallahassee, FL: Tall Timbers Research, Inc., 1991.
- Kotok, E.I. "Fire, a Problem in American Forestry." *Scientific Monthly* 31 (1930): 450-452.
- _____. "Fire, a Major Ecological Factor in the Pine Region of California." *Proceedings Fifth Pacific Science Congress, Canada*. University of Toronto Press, 1934.
- Kunzig, R. "These Woods are Made for Burning." *Discover* (1988): 86-95.
- Lambert S. and T.J. Stolingren. "Giant Sequoia Mortality in Burned and Unburned Stands: Does Prescribed Burning Significantly Affect Mortality Rates?" *Journal of Forestry* 86 (1988): 44-46.
- Landers, J. Larry. "About E.V. Komarek, Sr." In *17th Tall Timbers Fire Ecology Conference, May 18-21, 1989*, 3.
- _____. *High Intensity Fire in Wildland Management*. Tallahassee, FL: Tall Timbers Research, Inc., 1991.
- Langston, Nancy. *Forest Dreams, Forest Nightmares: The Paradox of Old Growth in the Inland West*. Seattle: University of Washington Press, 1995.
- Larson, G.B. "Whitaker's Forest." *American Forests* 72, no. 9 (1966): 22-25, 40-42.
- Lawrence, G.E. "Ecology of Vertebrate Animals in Relation to Chaparral Fire in the Sierra Nevada Foothills." *Natural Resources: Quality and Quantity* 47 (1966): 278-291.
- Lawrence, G. and H. Biswell. "Effect of Forest Manipulation on Deer Habitat in Giant Sequoia." *The Journal of Wildlife Management* 36 (1972): 595-605.
- Lee, Robert C. "Can Reason Suppress the Fire Demon?" in *Rangeland Fire Effects, A Symposium, November 27-29, 1984*, edited by Ken Sanders, Jack Durham, et al., 93-97. Boise: Bureau of Land Management/University of Idaho, 1984.

- Leiberg, John B. *Forest Conditions in the Northern Sierra Nevada, California*. Department of Interior, U.S. Geological Survey, Professional Paper No. 8. Washington D.C.: Government Printing Office, 1902.
- Leisz, Douglas R., and Carl C. Wilson. "To Burn or Not to Burn: Fire and Chaparral Management in Southern California." *Journal of Forestry*. (February 1980): 94-95.
- Leopold, Aldo. "'Piute Forestry' vs. Forest Fire Prevention." *Southwestern Magazine* 2 (1920): 12-13.
- _____. "Grass, Brush, Timber and Fire in Southern Arizona." *Journal of Forestry* 22 (1924): 1-10.
- Leopold, A. Starker, S.A. Cain, C.H. Cottam, Ira N. Gabrielson and T.L. Kimball. "The Leopold Committee Report: Wildlife Management in the National Parks." *American Forests* (April 1963): 32-35, 61-63.
- _____. "Let 'Em Burn." *Time* (October 28, 1974):. 78.
- Levine, Joel, ed. *Global Biomass Burning*. Cambridge, MA: MIT Press, 1991.
- Lewis, Henry T. *Patterns of Indian Burning in California: Ecology and Ethno-history*. Ramona, CA: Ballena Press, 1973.
- _____. "Why Indians Burned: Specific Versus General Reasons," Presented at the Wilderness Fire Symposium, Missoula, Montana, November 15-18, 1983.
- "Light Burning on Pine Forest." *American Forestry* 19, no. 10 (1913): 692.
- Little, Charles. "Smokey's Revenge." *American Forests* 99 (May/June 1993): 24-25, 58-60.
- _____. *The Dying of the Trees*. New York: Penguin Books, 1995.
- Lockmann, Ronald F. *Guarding the Forests of Southern California*. Glendale, CA: Arthur H. Clark Co., 1981.
- Loeffelbein, Bob. "Smokey Hits 40!" *American Forests* (May 1984): 33.
- Los Alamos National Laboratory. *A Special Edition of the SWEIS Yearbook Wildfire 2000*. LA-UR-00-3471. New Mexico: Los Alamos National Laboratory, August 2000.
- Lyman, Chalmer K. "Our Choice-A Mild Singe or a Good Scorching." *Northwest Science* 21, no. 3: (1947): 129-133.
- MacCleary, Doug. "Understanding the Role the Human Dimension Has Played in Shaping America's Forest and Grassland Landscapes." *EcoWatch*. February 10, 1994.
- Machlis, G.E., A.B. Kaplan, S.P. Tuler, K.A. Bagby, and J.E. McKendry. *Burning Questions: A Social Science Research Plan for Federal Wildland Fire Management*. Report to the National Wildfire Coordinating Group 2002. University of Idaho. Idaho Forest, Wildlife and Range Experiment Station, Contribution Number 943.
- Mackintosh, Barry. *The National Parks: Shaping the System*. Washington, DC: National Park Service, 1991.
- Maclean, John N. *Fire on the Mountain: The True Story of the South Canyon Fire*. New York: William Morrow, 1999.
- _____. *Fire and Ashes: On the Front Lines Battling Wildfires*. New York: Henry Holt & Co., 2004.
- Maclean, Norman. *Young Men & Fire*. Chicago: University of Chicago Press, 1992.

- Manning, Richard. "Friendly Fire." *Sierra* (January/February 2001): 40-41, 110.
- Manson, Marsden. "The Effect of the Partial Suppression of Annual Forest Fires in the Sierra Nevada Mountains." *Sierra Club Bulletin* 34 (January 1906): 22-24.
- Maunder, Elwood R. (interviewer). "Voice from the South: Recollections of Four Foresters." Oral history interviews with Inman F. Eldredge, Walter J. Damtoft, Elwood L. Demmon, and Clinton H. Coulter. Forest History Society, Santa Cruz, California, 1977.
- McBride, Joe R. "Managing National Parks." *Renewable Resources Journal* 11, no. 1 (Spring 1993): 24-25. In special report: "Workshop on National Parks Fire Policy: Goals, Perceptions, and Reality."
- McCarthy, G. Michael. *Hour of Trial: the Conservation Conflict in Colorado and the West*. Norman: University of Oklahoma Press, 1977.
- McCormick, W.C. "The Three Million." *American Forests* (August 1931): 479-480.
- McDowell, John. "The Year They Firebombed the West." *American Forests* (May/June 1993): 22-23, 55.
- McLaughlin, John S. "Restoring Fire to the Environment in Sequoia and Kings Canyon National Parks," 391-394. In *Tall Timbers Fire Ecology Conference (12)*. Tallahassee, FL, June 8-9, 1972.
- McManus, Reed. "Twice Burned? The Los Alamos Fire Rekindles Debate Over Logging." *Sierra* (September/October 2000): 16-17.
- McMlaran, M.P. "Comparison of Fire History Estimates Between Open-scarred and Intact *Quercus Douglasii*." *American Midland Naturalist* 120 (1988): 432-435.
- McPhee, John. *Encounters with the ArchDruid*. New York: Farrar, Straus and Giroux, 1971.
- Miller, Char, ed. *American Forests: Nature, Culture, and Politics*. Lawrence, KS: University Press of Kansas, 1997.
- _____. *Gifford Pinchot and the Making of American Environmentalism*. Washington, D.C.: Island Press, 2003.
- Minnich, Richard A. "Fire Mosaics in Southern California and Northern Baja California." *Science* 219 (March 18, 1983): 1287-1294.
- _____. *The Biogeography of Fire in the San Bernardino Mountain of California*. Berkeley: University of California Press, 1988.
- _____. "Landscapes, Land-use and Fire Policy: Where Do Large Fires Come From?" In J.M. Moreno, ed., *Large Forest Fires*. Leiden, The Netherlands: Backhuys Publishers, 1998, 133-158.
- Minnich, Richard A., and Yue Hong Chou. "Wildland Fire Patch Dynamics in the Chaparral of Southern California and Northern Baja California." *International Journal of Wildland Fire* 7, no. 3 (1997): 221-248.
- Monastersky, R. "Burning Questions." *Science News* 138 (1990): 264-266.
- Moore, William R. "From Fire Control to Fire Management." *Western Wildlands* 1, no. 3 (1974): 11-15.
- Morrison, Ellen Earnhardt. *Guardian of the Forest: A History of the Smokey Bear Program*. New York: Vantage Press, 1976.
- _____. *The Smokey Bear Story*. Alexandria, VA: Morielle Press, 1995.
- Morrison, Micah. *Fire in Paradise: The Yellowstone Fires and Politics of Environmentalism*. New York: HarperCollins, 1993.

- Muir, John. *The Mountains of California*. 1894. Reprint. New York: American Museum of Natural History and Doubleday, 1961.
- Murkowski, Frank H. "Lessons Must Be Learned from Los Alamos Fire." Press Release from Senator Frank H. Murkowski, Alaska, chairman of Senate Committee on Energy and Natural Resources. July 27, 2000. Online: <http://energy.senate.gov/press/releases/losalamos.firehearing.htm>
- Murphy, E.W. "California pays the Red Piper." *American Forests* (April 1939): 202. Special edition: "Yours in Trust-We Must Protect It from Fire."
- Murphy, James L., and Frank T. Cole. "Villains to Heroes: Overcoming the Prescribed Burner Versus Forest Firefighter Paradox," 17-22. In *Proceedings 20th Tall Timbers Fire Ecology Conference*. Tallahassee, FL: Tall Timbers Research, Inc. 1998.
- Murphy, R.W. "Experimental Burning in Park Management" 7. In *Proceedings from the California Tall Timbers Fire Ecology Conference*. (Nov. 9-10, 1967): 207-216.
- Mutch, Robert W. "Fighting Fire with Prescribed Fire: A Return to Ecosystem Health." *Journal of Forestry* (November 1994): 31-33.
- _____. "I Thought Forest Fires Were Black!" *Western Wildlands* 1, no. 3 (1974): 16-21.
- _____. "Understanding Fire as Process and Tool." Adapted from "Fire Management Today: Tradition and Change in the Forest Service." Presented at Society of American Foresters National Convention. Washington, D.C., September 28 to October 2, 1975.
- _____. "Will We Be Better Prepared for the Fires of 2006?" *Bugle: Journal of the Rocky Mountain Elk Foundation* (March/April, 2001).
- _____. "Wilderness Fires Allowed to Burn More Naturally." *Fire Control Notes* 33 (1972): 3-6.
- _____. "Wildland Fires and Ecosystems – A Hypothesis." *Ecology* 51 (1970): 1046-51.
- National Research Institute. "How Can We Live with Wildland Fire?" California Communities Program, University of California, Davis, 1995.
- Nelson, Robert H. *A Burning Issue: A Case for Abolishing the U.S. Forest Service*. New York: Rowman & Littlefield, 2000.
- Oberle, Mark. "Forest Fires: Suppression Policy Has Its Ecological Drawbacks." *Science* 165 (August 1969): 568-571.
- Oettmeier, W.M. "The Place of Prescribed Burning." *Forest Farmer* (May 1956): 6, 7, 18, 19.
- Olmsted, Frederick E. "Fore and the Forest – The Theory of 'Light Burning.'" *Sierra Club Bulletin* 8 (January 1911): 42-47.
- _____. "Forest Devastation: A National Danger and a Plan to Meet It." *Journal of Forestry* 17 (1919): 911-935. Letter of Transmittal November 1.
- Ong, D. "Fighting Fire with Fire: How Fire Plays a Beneficial Role in the Health of the Forest." *UC Davis Magazine* (May-June 1989): 8-11.
- Ostrander, H.J. "How to Save the Forests by Use of Fire." Letter to Editor. *San Francisco Call*. September 23, 1902.
- Paige, John C. *The Civilian Conservation Corps and the National Park Service, 1933-1942: An Administrative History*. Washington, DC: National Park Service, 1985.
- Parsons, David J. "Prescribed Fire Review Sparks Studies of Giant Sequoia-Fire Interactions." *Park Science* 9 (1989): 19.

- _____. "Objects or Ecosystems? Giant Sequoia Management in National Parks." In *Proceedings of the Symposium on Giant Sequoias: Their Place in the Ecosystem and Society, 23-25 June 1992, Visalia, California*. USDA Forest Service General Technical Report PSW-GTR-151.
- _____. "The Role of Fire Management in Maintaining Natural Ecosystems." In *Fire Regimes and Ecosystem Properties, 1981*. USDA Forest Service General Technical Support GTR-WO-26.
- _____. "The Role of Fire in Natural Communities: An Example from the Southern Sierra Nevada." *Environmental Conservation* 3, no. 2 (1976): 91-99.
- _____. "The Role of Fire in Park Management." *Parks* 2 (1977): 1-4.
- Parsons, David J., and Stephen J. Botti. "Restoration of Fire in National Parks." In *The Use of Fire in Forest Restoration*. General Technical Report INT-GTR-341 (June 1996): 29-31. Online: http://www.fs.fed.us/rm/pub/int_gtr341/gtr341_4.html
- Parsons, D.J. and S.H. DeBenedetti. "Impact of Fire Suppression on a Mixed-Conifer Forest." *Forest Ecology* 2 (1979): 21-33.
- Parsons, David J., and Jan W. van Wagtenonk. "Fire Research and Management in the Sierra Nevada National Parks." In W.L. Halvorson and G.E. Davis, eds., *Ecosystem Management in the National Parks*. Tucson: University of Arizona Press, 1996, 25-48.
- Parsons, D.S., D.M. Graber, J.K. Agee, and J. van Wagtenonk. "Natural Fire Management in National Parks." *Environmental Management* 10 (1986): 21-24.
- Parsons, D., L. Bancroft, T. Nichols, and T. Stohlgren. "Information Needs for Natural Fire Management Planning." In J.F. Lotan, B.M. Kilgore, W.C. Fischer, and R.F. Mutch, eds. *Proceedings Symposium and Workshop on Wilderness Fire. 15-18 November 1983, Missoula, Montana*. USDA Forest Service General Technical Report INT-182.
- Phillips, J. "The Crisis in Our Forests." *Sunset Magazine*. (July 1995): 87-92.
- Pinchot, Gifford. "The Relation of Forests and Forest Fires." *National Geographic* 10 (1899): 393-403.
- _____. *The Fight for Conservation*. New York: Doubleday, Page and Co., 1910.
- _____. *Breaking New Ground*. 1947. Reprint. Washington, D.C.: Island Press, 1998.
- Plumb, T.R. "Response of Oaks to Fire." In *Proceeding of the Symposium on the Ecology, Management, and Utilization of California Oaks, June 26-28, 1979, Claremont, California*. USDA Forest Service General Technical Report PSW-44.
- Plummer, Fred G. *Forest Fires: Their Causes, Extent and Effects, with a Summary of Recorded Destruction and Loss*. USDA Forest Service-Bulletin 117. Washington, D.C.: Government Printing Office, 1912.
- Polenberg, Richard. *Reorganizing Roosevelt's Government: The Controversy over Executive Reorganization, 1936-1939*. Cambridge: Harvard University Press, 1966.
- Pyne, Stephen J. *Fire in America: A Cultural history of Wildland and Rural Fire*. 1982. Reprint. Seattle: University of Washington Press, 1997.
- _____. *America's Fires: Management on Wildlands and Forests*. Durham, NC: Forest History Society, 1997.
- _____. "Firestick History." *Journal of American History* 76 no. 4 (1990): 1132-1141.
- _____. "The Fires This Time, and Next." *Science* 294: 1005-1006.

- _____. *Smokechasing*. Tucson: University of Arizona Press, 2003.
- _____. *World Fire: The Culture of Fire on Earth*. New York: Henry Holt and Co., 1995.
- _____. *Year of the Fires*. New York: Viking Penguin, 2001.
- _____. *Tending Fire: Coping with America's Wildland Fires*. Washington, D.C.: Shearwater Books, 2004.
- Pyne, Stephen, Patricia Andrews and Richard Laven. *Introduction to Wildland Fire*, 2nd edition. New York: Wiley, 1996.
- Rasmussen, Matt. "The Long Reach of Humanity." *Forest Magazine* (March/April 2000): 14-19.
- Reddington, Paul G. "What Is the Truth? Conclusion of the Light-Burning Controversy." *Sunset, The Pacific Monthly* 44 (June 1920): 56-58.
- Rice, Carol. "A Balanced Approach: Dr. Biswell's Solution to Fire Issues in Urban Interface and Wildland Ecosystems." USDA Forest Service Gen. Tech. Rep. PSW-GTR-158. First presented at the "Biswell Symposium: Fire Issues and Solutions in Urban Interface and Wildland Ecosystems," February 15-17, 1994. Walnut Creek, CA, 1995.
- Rodgers III, Andrew Denny. *Bernard Edward Fernow, A Story of North American Forestry*. Princeton, NJ: Princeton University Press, 1951.
- Romme, William H. "Fire and Landscape Diversity in Subalpine Forests of Yellowstone National Park." *Ecological Monographs* 52 (1982): 199-221.
- Romme, William H., M.G. Turner, R.H. Gardner, W.W. Hargrove, G.A. Tuskan, D.G. Despain, and R.A. Renkin. "A Rare Episode of Sexual Reproduction in Aspen (*Populus Tremuloides Michx*) Following the 1988 Yellowstone Fires." *Natural Areas Journal* 17 (1997): 17-25.
- Romme, William H., L.L. Wallace and J.S. Walker. "Aspen, Elk, and Fire in Northern Yellowstone National Park." *Ecology* 76, no. 7 (1995): 2097-2106.
- Rothman, Hal K., "A Regular Ding-Dong Fight': Agency Culture and Evolution in the Park Service-Forest Service Dispute, 1916-1937." *Western Historical Quarterly* 20 2 (May 1989): 141-61.
- _____. *Devil's Bargains: Tourism in the Twentieth Century American West*. Lawrence: University Press of Kansas, 1998.
- _____. ed. *"I'll Never Fight Fire With My Bare Hands Again": Recollections of the First Forest Rangers of the Inland Northwest*. Lawrence, KS: University Press of Kansas, 1994.
- _____. *Preserving Different Pasts: The American National Monuments*. Urbana: University of Illinois Press, 1989.
- Rundel, P.W. "The Relationship Between Basal Fire Scars and Crown Damage in Giant Sequoia." *Ecology* 54 (1973): 210-213.
- Rundel, P.W. and D.J. Parsons. "Structural Changes Along a Fire-Induced Age Gradient." *Journal of Range Management* 32, no. 6 (1979): 462-466.
- Runte, Alfred. *National Parks: The American Experience*. 3rd edition. Lincoln, NE: University of Nebraska Press, 1997.
- Sando, R.W. "Natural Fire Regimes and Fire Management – Foundations for Direction." *Western Wildlands* 4, no. 4 (1978): 34-44.
- Schiff, Ashley L. *Fire and Water, Scientific Heresy in the Forest Service*. Cambridge, MA: Harvard University Press, 1962.

- Schimke, Harry E., and Lisa R. Green. "Prescribed Fire for Maintaining Fuel-Breaks in the Central Sierra Nevada." Berkeley, California: Pacific Southwest Forest and Range Experiment Station, 1970.
- Schultz, A.M., and H.H. Biswell. "Reduction of Wildfire Hazard." *California Agriculture* 10, no.11 (1956): 4-5.
- Sellars, Richard West. *Preserving Nature in the National Parks*. New Haven, CT: Yale University Press, 1997.
- Shankland, Robert. *Steve Mather of the National Parks*. New York: Alfred A. Knopf, 1951.
- Shea, John P. "Our Pappies Burned the Woods." *American Forests* (April 1940): 159-174.
- Shipek, Florence. "Kumeyaay Plant Husbandry: Fire, Water, and Erosion Management Systems." In *Before the Wilderness: Environmental Management by Native Californians*, edited by Thomas C. Blackburn and Kat Anderson. Menlo Park, CA: Ballena Press, 1993.
- Shoemaker, Len. *Saga of a Forest Ranger; A Biography of William R. Kreutzer, Forest Ranger No. 1*. Boulder: University of Colorado Press, 1958.
- Sholly, Dan R. with Steve M. Newman. *Guardians of Yellowstone: An Intimate Look at the Challenges of Protecting America's Foremost Wilderness Park*. New York: William Morrow and Company, 1991.
- Show, Stuart Bevier. "Personal Reminiscences of a Forester 1907-1931." Written at the request of R.E. McArdle, Chief, U.S. Forest Services. Berkeley, California, 1955.
- Show, S.B. and E.I. Kotok. "Fire and the Forest (California Pine Region)." USDA, Department Circular 358. Washington, D.C., August 1925.
- _____. "Forest Fires in California, 1991-1920: An Analytical Study." USDA, Department Circular 243. Washington, D.C., February 1923.
- _____. "National Forests in California; An Interview Conducted by Amelia Roberts Fry." University of California, Regional Cultural History Project, Berkeley, 1965.
- _____. "The Role of Fire in the California Pine Forest." USDA, Department Bulletin No. 1294. Washington, D.C., December 1924.
- Smith, Conrad. *Media and Apocalypse: News Coverage of the Yellowstone Forest Fires, Exxon Valdez Oil Spill, and Loma Prieta Earthquake*. Westport, CT: Greenwood Press, 1992.
- Society of American Foresters "Fire as a Tool in Forest Protection and Management." In *Proceedings, Society of American Foresters, Southern California Section, Annual Meeting, December 1, 1962*. Oakland, CA, 1962.
- Spence, Mark David. *Dispossessing the Wilderness: Indian Removal and the Making of the National Parks*. New York: Oxford University Press, 1999.
- Steen, Harold K. *The U.S. Forest Service: A History*. Seattle: University of Washington Press, 1976.
- Stephenson, N.L., D.J. Parsons, and H.T. Nichols. "Replies From the Fire Gods." *American Forests* 96 (1990): 35, 70.
- Sterling, E.A. "Attitude of Lumberman Toward Forest Fires." In *Yearbook of the united States Department of Agriculture, 1904*. Washington, D.C.: Government Printing Office (1905): 133-140.

- Stoddard, H.L. "The Use of Fire in Pine Forests and Game Lands of the Deep Southeast." In *Proceedings, First Tall Timbers Fire Ecology Conference*, 31-42. Tallahassee, FL: Tall Timbers Research Institute, 1962.
- Stolzenburg, W. "Fire in the Rain Forest." *Nature Conservancy Magazine* (May/June 2001): 22-27.
- _____. "Reapers of the Flame." *Nature Conservancy Magazine* (May/June 2001): 10-11.
- Strohmaier, David J. *The Seasons of Fire: Reflections on Fire in the West*. Reno: University of Nevada Press, 2001.
- Suckling, Kieran. "Fire & Forest Ecosystem Health in the American Southwest." Southwest Forest Alliance/Southwest Center for Biological Diversity, 1996. Online: <http://www.sw-center.org/swcbd/papers/fire-prm.html>
- Sullivan, Margaret. *Firestorm! The Story of the 1991 East Bay Fire in Berkeley*. Berkeley, CA: City of Berkeley, 1993.
- Swain, Donald C. *Wilderness Defender: Horace M. Albright and Conservation*. Chicago: University of Chicago Press, 1970.
- Sweeney, J.R., and H.H. Biswell. "Quantitative Studies of the Removal of Litter and Duff by Fire under Controlled Conditions," *Ecology* 42, no. 3 (1961): 572-575.
- Swetnam, T.W. "Fire History and Climate Change in Giant Sequoia Groves." *Science* 262 (1993): 885-889.
- Task Force on California's Wildland Fire Problem. "Recommendations to Solve California's Wildland Fire Problem." California Department of Conservation. June 1972.
- Taylor, Ron. "Fire in the Redwoods." *Westways* (August 1968): 36-37.
- Thurmond, Jack. "Through 1930 with the Dixie Crusaders." *American Forests* (March 1930): 151.
- Timbrook, Jan, John R. Johnson, and David D. Earle. "Vegetation Burning by the Chumash." In *Before the Wilderness: Environment Management by Native Californians*, edited by Thomas C. Blackburn and Kat Anderson. Menlo Park, CA: Ballena Press, 1993.
- Turner, M.G., W.H. Romme, and D.B. Tinker. "Surprises and Lessons from the 1988 Yellowstone Fires." *Frontiers in Ecology and the Environment* 1 (2003): 351-358.
- Tweed, W. "Born of Fire." *National Parks Magazine* 61 (1987): 23-27, 45.
- Udall, Stewart. *The Quiet Crisis*. New York: Holt, Rinehart & Winston, 1963.
- U.S. Bureau of Land Management. "Using Fire to Manage Public Lands." BLM National Office of Fire and Aviation. Boise, ID, 1997. Pamphlet.
- _____. "Burning Issues; An Interactive Multimedia Program." Joint project of the Bureau of Land Management and Florida State University. Tallahassee, FL: Florida State University, 2000.
- U.S. Department of Agriculture, Forest Service. "The True Story of Smokey Bear." Western Publishing Company, 1960. Comic book.
- _____. "Rx Fire!" Southwestern Region, USDA Forest Service, 1994. Pamphlet.
- _____. "Living With Fire." USDA Forest Service, Southwestern Region, 2000.
- U.S. Department of the Interior. "Review and Update of the 1995 Federal Wildland Fire Management Policy." Report to the Secretaries of the Interior, of Agriculture, of Energy, of Defense, and of Commerce; the Administrator, Environmental Protection Agency; the Director, Federal Emergency Management Agency; and

- the National Association of State Foresters, by an Interagency Federal Wildland Fire Policy Review Working Group. Boise, ID, National Interagency Fire Center, January 2001.
- U.S. General Accounting Office. "Western National Forests: A Cohesive Strategy Is Needed to Address Catastrophic Wildfire Threats." GAO-RCED-99-65. Washington, D.C., April 2, 1999.
- U.S. National Park Service. "The Yellowstone Fires: A Primer on the 1988 Fire Season." Yellowstone National Park, California, October 1, 1988.
- _____. "Cerro Grande Prescribed Fire Investigation Report." May 18, 2000. Online: <http://www.nps.gov/cerrogrande.htm>
- _____. "Cerro Grande Prescribed Fire Board of Inquiry Final Report." National Park Service. February 26, 2001. Online: http://www.nps.gov/fire/fireinfo/cerrogrande/reports/Board_report-feb26final.pdf
- Vale, Thomas. "The Myth of the Humanized Landscape: An Example from Yosemite National Park." *Natural Areas Journal* 18, no. 3 (1999): 231-236.
- _____. *Fire, Native Peoples, and the Natural Landscape*. Washington D.C.: Island Press, 2002.
- Vankat, J.L. "Fire and Man in Sequoia National Park." *Annals of the Association of American Geographers* 67 (1977): 17-27.
- van Wagtenonk, Jan W. "Dr. Biswell's Influence on the Development of Prescribed Burning in California," 11-15. In USDA Forest Service General Technical Report PSW-GTR-158, *The Biswell Symposium: Fire Issues and Solutions in Urban and Wildland Ecosystems, February 15-17, 1994*. Walnut Creek, California, 1995.
- _____. "Fire Management in the Yosemite Mixed-Conifer Ecosystem." In Harold A. Mooney, and Conrad C. Eugene, technical coordinators, *Proceedings of the Symposium on the Environmental Consequences of Fire and Fuel Management in Mediterranean Ecosystems*, August 1-5, 1977. Palo Alto, CA. Gen. Tech. Rep. WO-3. Washington, D.C.: U.S. Department of Agriculture, Forest Service: 459-463.
- _____. "Fire Suppression Effects on Fuels and Succession in Short-fire Interval Wilderness Ecosystems." In J.F. Lotan, B.M. Kilgore, W.C. Fischer, and R.F. Mutch eds. *Proceedings Symposium and Workshop on Wilderness Fire. 15-18 November 1983, Missoula, Montana*. USDA Forest Service General Technical Report INT-182.
- _____. "GIS Applications in Fire Management Research." In S.C. Nodvin and T.A. Waldrop. *Fire and the Environment: Ecological and Cultural Perspectives: Proceedings of an International Symposium 1991*. USDA Forest Service Southeastern Forest Experimental Station General Technical Report GTR-SE-69
- _____. "Large Fires in Wilderness Areas." In J.K. Brown, R.W. Mutch, C.W. Spoon, R.H. Wakimoto, eds. *Proceedings: Symposium on Fire in Wilderness and Park Management, 30 March-1 April 1993, Missoula, Montana*. USDA Forest Service General Technical Report INT-GTR-320.
- _____. "Park Goals and Current Fire Policy." In Special Report: "Workshop on National Parks Fire Policy: Goals, Perceptions, and Reality." *Renewable Resources Journal*. 11, no. 1 (Spring 1993): 19.

- _____. "The Role of Fire in the Yosemite Wilderness." Presented at the National Wilderness Research Conference, Fort Collins, CO, July 23-26, 1985.
- _____. "Spatial Patterns of Lightning Strikes and Fires in Yosemite National Park." In *Proceedings of the 12th Conference on Fire and Forest Meteorology*, 26-28 October 1993, Jekyll Island, GA. Society of American Foresters, Bethesda, MD.
- _____. "Wilderness Fire Management in Yosemite National Park." In *Earthcare: Global Protection of Natural Areas*, edited by E.A. Schofield. *Proceedings of the Fourteenth Biennial Wilderness Conference*. Boulder, CO: Westview Press, 1978.
- Vitas, George. *Forest and Flame in the Bible*. A Program Aid of the Cooperative Forest Fire Prevention Campaign Sponsored by the Advertising Council, State Foresters, and the U.S. Department of Agriculture, Forest Service – PA-93. Reprinted December 1961.
- Vogl, Richard J. "Comments on Controlled Burning." In *Tall Timbers Fire Ecology Conference* 9, April 10-11, 1969, Tall Timbers Research Station, Tallahassee, Florida, 1-4.
- _____. "Smokey's Mid-Career Crisis." *Saturday Review of the Sciences* 1, no. 2 (March 1973): 23-29.
- Wagle, R.F., and Thomas W. Eakle. "A Controlled Burn Reduces the Impact of a Subsequent Wildfire in a Ponderosa Pine Vegetation Type." *Forest Science* 25, no. 1 (1979): 123-128.
- Wagner, W.W. "Past Fire Incidence in Sierra Nevada Forests." *Journal of Forestry* 59 (1961): 739-748.
- Wahlenberg, W.G., S.W. Greene, and H.R. Reed. "Effects of Fire and Cattle Grazing on Longleaf Pine Lands, as Studied at McNeill, Miss." Technical Bulletin No. 683. Washington, D.C., U.S. Department of Agriculture, June 1939.
- Wakimoto, R.H. "The Yellowstone Fire of 1988: Natural Processes and National Policy." *Northwest Science* 64 (1990): 239-242.
- Walker, T.B. "T.B. Walker Expresses His Views on Conservation," *San Francisco Chronicle*, January 5, 1913, 56.
- Weaver, Harold. "Effects of Prescribed Burning in Ponderosa Pine." *Journal of Forestry* 55 (February 1957): 823-826.
- _____. "Fire and Management Problems in Ponderosa Pine." *3rd Annual Tall Timbers Fire Ecology Conference, April 9-10, 1964*, 61-79. Tallahassee, FL: Tall Timbers Research Station, 1964.
- _____. "Fire as an Ecological and Silvicultural Factor in the Ponderosa-Pine Region of the Pacific Slope." *Journal of Forestry* 41 (January 1943): 7-15.
- _____. "Fire as an Ecological Factor in the Southwestern Ponderosa Pine Forests." *Journal of Forestry* 49 (February 1951): 93-98.
- _____. "Fire as an Enemy, Friend, and Tool in Forest Management." *Journal of Forestry* 53 (July 1955): 499-504.
- _____. "Implications of the Klamath Fires of September 1959." *Journal of Forestry* 59 (August 1961): 569-572.
- Weaver, Harold and Harold Biswell. "How Fire Helps the Big Trees." *National Parks & Conservation Magazine* 43 (1969): 16-19.
- Weldon, Leslie A.C. "The Use of Fire in Forest Restoration: Dealing with Public Concerns in Restoring Fire to the Forest." General Technical Report INT-GTR-

341. USDA Forest Service, Rocky Mountain Research Station. Online:
http://www.fs.fed.us/rm/pubs/int_ugtr341/gtr341_6.html
- Wheeler, H.N. "Controlled Burning in Southern Pine." *Journal of Forestry* 42 (June 1944): 449.
- Whelan, Robert J. *The Ecology of Fire*. Cambridge, MA: Cambridge University Press, 1995.
- White, John R. "Letters to the *Times*: Scare Heads Mislead." Letter to editor from Superintendent, Sequoia National Park. *Los Angeles Times*. August 29, 1928.
- White, John R. and W. Fry. *Big Trees*. Palo Alto, CA: Stanford University Press, 1931.
- White, Stewart E. "Woodsmen, Spare Those Trees! Our Forests Are Threatened; A Plea for Protection." *Sunset, The Pacific Monthly* (March 1920): 23-26, 108-117.
- _____. "Getting at the Truth. Is the Forest Service Really Trying to Lay Bare the Facts of the Light-Burning Theory?" *Sunset, The Pacific Monthly* (May 1920): 62, 80-82.
- Wilkinson, T. "Prometheus Unbound." *Nature Conservancy Magazine* (May/June 2001): 12-20.
- Williams, Ted. "Incineration of Yellowstone." *Audubon* (January 1989): 38-85.
- _____. "Only You Can Postpone Forest Fires." *Sierra* 80 (1995): 36-43.
- _____. "Burning Money." *Audubon* 103 (January-February 2001): 34-41.
- Wilson, Carl C., and James B. Davis. "Forest Fire Laboratory at Riverside and Fire Research in California: Past, Present, and Future." General Technical Report PSW-105. Pacific Southwest Forest and Range Experiment Station. Berkeley, California, May 1988.
- Wirth, Conrad L. *Parks, Politics, and the People*. Norman: University of Oklahoma Press, 1980.
- Wooley, H.E. "What Has Been Accomplished in Fire Protection on the National Forests." *American Forestry* 19 (November 1913).
- Wright, R. Gerald. *Wildlife Research and Management in the National Parks*. Urbana: University of Illinois Press, 1992.
- Wright, H.A. and A.W. Bailey. *Fire Ecology: United States and Canada*. Wiley Interscience, 1982.
- Wuerther, G. "Fire Power." *National Parks & Conservation Magazine* (May/June 1995): 32-37.
- Zinke, P.J. and R.L. Crocker. "The Influence of Giant Sequoia on Sol Properties." *Forest Science* 8: (1962): 2-11.

Primary Sources

- Bandelier National Monument Archives, Bandelier National Monument, NM.
- Everglades National Park Archives, Everglades National Park, FL.
- Glacier National Park Archives, Glacier National Park.
- Grand Canyon National Park Archives, Grand Canyon National Park, AZ
- Grand Teton National Park Archives, Grand Teton National Park, WY.
- Mesa Verde National Park Archives, Mesa Verde National Park, CO.
- National Archives and Records Administration, College Park, Maryland, Record Group 79, Records of the National Park Service.

National Archives and Records Administration, Kansas City, Missouri, Record Group 79,
Records of the National Park Service.
National Archives and Records Administration, San Bruno, California, Record Group 79,
Records of the National Park Service.
National Archives and Records Administration, Denver, Colorado, Record Group 79,
Records of the National Park Service.
National Archives and Records Administration, Laguna Niguel, California, Record
Group 79, Records of the National Park Service.
National Archives and Records Administration, Seattle, Washington, Record Group 79,
Records of the National Park Service.
National Archives and Records Administration, Anchorage, Alaska, Record Group 79,
Records of the National Park Service.
National Interagency Fire Center, Records, National Interagency Fire Center.
National Park Service, Alaska Area Region, Records, Anchorage, AK.
National Park Service, Intermountain Region, Records, Denver, CO.
National Park Service, Midwest Region, Omaha, NE.
National Park Service, Pacific West Region, Records, Oakland, CA.
National Park Service, Technical Information Center, Denver, CO.
Rocky Mountain National Park Archives, Rocky Mountain National Park, CO.
Sequoia-Kings Canyon National Park Archives, Sequoia National Park, CA.
Tall Timbers Research Station, file, Tall Timbers, FL.
Yosemite National Park Archives, Yosemite National Park, CA.
Yellowstone National Park Archives, Yellowstone National Park, WY.

Oral Interviews

Agee, James
Allen, Craig D.
Barbee, Robert
Cella, Brad.
Cook, James
Christensen, Norm
Gale, Rick
Kilgore, Bruce
Linn, Robert (email)
Lissoway, John
McKibben, Kevin
Pyne, Stephen J.
Van Wagtendonk, Jan

Oral interviews can be found at the National Park Service, Harper's Ferry Center archive.