

Yellowstone National Park

AND THE SUMMER OF FIRE

BY DIANE SMITH

Because of their close relationships with fires, western forest ecosystems are considered fire dependent. If we hope to sustain the communities of trees, plants, and animals that characterize these wildland forests, we need to understand the natural role of fire, changes brought about by suppressing fire, and alternatives for restoring some reasonable semblance of the natural fire process (Arno and Allison-Bunnell, 2002).

In 2013, Yellowstone National Park will mark the 25th anniversary of the 1988 fires that burned approximately 1.2 million acres in and around the Greater Yellowstone Ecosystem. In Yellowstone itself, fires covered 793,880 acres or 36 percent of the Park. The largest fire-fighting effort in the US up to that time, the Yellowstone fires cost \$120 million to fight, and involved 25,000 people. While firefighters worked around the clock to protect human life and property, the National Park Service later admitted that little could be done to control or stop the fires “because weather and drought made the fires behave in unusual ways” (US Department of Interior, 2008). As research forester Mark Finney explained about Yellowstone and other stand-replacing fires in the West, “these big fires burn until they run out of weather or fuel” (Finney, 2012).

Richard Rothermel, at the time one of the world’s leaders in understanding fire behavior, arrived in Yellowstone the summer of 1988 to help predict worst-case scenarios as the fires spread throughout the Park. Working with a team of Forest Service fire

researchers from the Intermountain Fire Sciences Laboratory (now known as the Missoula Fire Sciences Laboratory), the scientists established a command and control facility in concert with the National Park Service. Using current weather data, ground observations, and the best models available at the time, they attempted to help Yellowstone managers anticipate and prepare for the worst possible outcomes. But each time the team had its predictions ready, the fire exceeded them.

Rothermel later explained that, “We couldn’t come up with a worst-case scenario because ... the winds came again and again and again, and the worst case happened almost weekly.... It was an amazing season,” he recalled. “Nobody had seen this combination of weather and fires before” (Wells, 2008). Patricia Andrews, a researcher and colleague of Rothermel in 1988, confirmed that the Yellowstone fires set the standards of “worst case.” However, she added, several fire seasons in the Rocky Mountain West since that time have exceeded the worst cases of 1988, suggesting that Yellowstone may indeed be a harbinger of wildland fires to come (Andrews, 2012).

The wildfires in Yellowstone National Park in 1988 captured the nation’s attention and had a significant impact on the federal agencies assigned to manage public lands. They also ignited a fire of controversy surrounding how these agencies did their job and influenced how the media and, thus, the public viewed wildland fires. National and even international news



PICTURE 1: LODGEPOLE PINE REGROWTH IN YELLOWSTONE. PHOTO BY ANN DEUTCH. 1989.

media were transfixed, reporting on the Park's "total destruction" as fires burned through a cultural icon deeply connected to the American identity. With the 25th anniversary of the 1988 Yellowstone Park fires approaching, now is a good time to look back on some of the lessons learned as a result of those fires.

A Landscape Shaped by Fire

Scientists refer to western forest ecosystems as "fire dependent" because they have evolved in relation to fire. For example, many lodgepole pines, a tree species that commonly dominates Northern Rocky Mountain landscapes, rely on the intense heat of fire to release their seeds. When fires are kept out of forests of fire-dependent species, trees and other plants lack the conditions needed to reproduce, putting the long-term ecological health of the forest at risk. In the Yellowstone region, fires have helped shape the landscape for millennia and yet, in 1886 with the arrival of the US Cavalry to manage the Park, all wildland fires were routinely suppressed. As one military superintendent reported, while the nation assumed that the troops came to the Park to protect the natural curiosities, "the amount of such work performed cuts so small a figure compared with the work on fires as not to be worth mentioning" (Boutelle, 1890).

Few scientists or managers challenged the policy of early detection and suppression of fires until the early 1960s, when an advisory board led by A. Starker Leopold, son of environmentalist Aldo Leopold, submitted a report to Secretary of the Interior Stewart Udall. The report reevaluated how the national parks managed their wildlife and, because fire is essential for maintaining high-quality habitat for many wildlife species, questioned the long-standing tradition of suppressing all fires. Not allowing naturally occurring fires to burn, the report argued, altered park ecosystems through a regime of "unnatural protection from lightning fires." Fire suppression had a negative effect on park environments and the wildlife that relied on them (Leopold et al., 1963).

Even though the Leopold report eventually resulted in changes to fire policy throughout the National Park Service, leaving some lightning-caused fires to burn if they did not threaten historic structures or the safety of visitors, a century-long commitment to aggressively suppressing all fires had taken its toll. Yellowstone National Park in particular had increasingly uniform, continuous expanses of mature fire-dependent forest—perfect conditions for a large fire. When the first small fire broke out along Storm Creek just north of the Park in June 1988, it encountered dry, windy

conditions that were perfect for fire spread. It could start to burn and keep on burning.

After the fires, however, the Park rebounded in ways that many would have found hard to imagine in the heat of the moment. One of the more remarkable photographs taken in 1989, just one year after the Yellowstone fires, illustrates a fledgling forest already replacing a burned stand (Picture 1). Another from that same year shows a field of wildflowers thriving in a rejuvenated meadow (Picture 2). Thanks to a series of well-placed interpretative panels throughout the Park and the new growth that transformed burned-over areas, the three million people who visit Yellowstone National Park each year could see firsthand the important role fire has played for centuries in the Yellowstone ecosystem. In many ways, the high-profile fires in Yellowstone led to a turning point in interpretation that has the potential to improve the public understanding of the creative role fire has played in the Rocky Mountain West.

A National Model of Exurban Development

The 1988 fires in Yellowstone became a national demonstration of the power of fire to rejuvenate the land. They also highlighted, by their threats to the Park's built infrastructure, the potential risks associated with wildland/urban (or "ex-urban") development.

Throughout the late 19th and early 20th century, access to transportation and natural resources constrained rural development and growth in areas outside of Yellowstone National Park (e.g., see Hansen, 2010). Inside Yellowstone boundaries, however, Park managers attempted to circumvent those constraints, transforming a rectangle drawn on a map in 1872 into a national model of early exurban development. Under the direction of the Department of War and the Secretary of the Interior, the Army Corps of Engineers carved out a well-controlled environment with comfortable housing, stately hotels, graceful lawns, and semi-wild animals on display, much like the larger zoological parks in the East. Government agencies in Yellowstone created the illusion of keeping nature in its place as they developed and sustained a national model of western development that they attempted to keep virtually free from wildland fire for close to a century. But even the US government cannot hold back the forces of nature forever, as the summer of 1988 demonstrated.

Global Warming, the Wildcard in Wildland Fires

One additional event from that summer stands out as significant and supports the idea that Yellowstone

may continue to serve as a national model of the risks associated with rural development and wildland fire. In June 1988, physicist James Hansen warned Congress that the Earth had entered a long-term warming trend and that human-made greenhouse gases were almost surely responsible (Shabecoff, 1988). Global warming, Hansen warned again twenty years later, would enhance extremes of the water cycle, resulting in stronger droughts and more severe forest fires, as well as heavier rains and floods (Revkin, 2008).

With large fires in Colorado and other places in the Rocky Mountain West in 2012, the idea that a changing climate might result in more severe wildland fires seems to have struck a chord. "US wildfires are what global warming really looks like, scientists warn," blared one headline from as far away as England (Guardian, 2012). Even a political blog at the Washington Post featured a story on the Colorado wildfires, highlighting global warming research that predicts an increase in the frequency and duration of large wildfires, and recommends prescribed fires as one way to better manage some fire-dependent lands (Plumer, 2012). Like the improved understanding of fire effects in Yellowstone, this story represents a major change in national media coverage of wildland fires, since neither message – global warming or prescribed fires – played a key role in post-fire discussions of the Yellowstone fires.

From its earliest years, scientists looked to Yellowstone National Park as an open-air laboratory for better understanding the biogeography of the American West. The fires in Yellowstone continue to contribute to that legacy, serving as a national model for research and education while initiating new ways of understanding wildland fire and its effects. With the 25th anniversary of the 1988 fires upon us, now is a good time to reconsider some of these lessons to ensure that they have indeed been learned. 🙏

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PICTURE 2: FLOWERS AMONGST BURNED DOUGLAS FIRS NEAR TOWER JUNCTION, YELLOWSTONE. PHOTO BY JIM PEACO. LATE AUGUST 1989.