

The 1988 Yellowstone Fires: Preliminary Report

The fires that burned large portions of the Greater Yellowstone Area (GYA) in the summer of 1988 are being called the most significant ecological event in the history of the national parks. They are also being called the result of the largest fire suppression effort in history. They have generated enormous media attention, substantial political controversy, intense scientific interest, and a remarkable outpouring of public concern. It is too soon to judge the effects of all this attention on the park and on NPS and USFS policy, but the fires have now been studied enough that at least a preliminary summary of their scope and ecological effects can be made.

Over the past 30 years, several NPS areas have cautiously embraced one form of prescribed burning or another, in recognition of fire's important role in the natural processes of a wilderness setting. Everglades NP began using prescribed (man-set) fires in 1958, and in 1964 study plots were first burned in Sequoia and Kings Canyon NPs. The first natural fires to be permitted to burn also occurred in Sequoia and Kings Canyon, in 1968. By 1978, 12 areas in the national park system had natural fire zones. In 1972, Yellowstone initiated its Fire Management Plan by designating 340,000 acres as appropriate for natural fires. Over the next several years, and after an Environmental Assessment in 1976, more than 1,700,000 acres in Yellowstone were included within natural fire zones, and cooperative agreements were reached with surrounding national forests to allow natural fires to burn across certain administrative boundaries.

In the first 16 years of Yellowstone's program (1972-1987), many thousand lightning strikes occurred, but few burned any acreage. In all, 235 fires burned a total of 34,157 acres. The largest fire burned 7,400 acres, but most burned only a few acres. It became clear that only in extremely dry years will natural fires grow large in Yellowstone.

1988 was an extremely dry year. Though April and May experienced 155 and 181 percent of normal precipitation respectively, June rainfall was 20 percent of normal. July was 79 percent of normal, and August was only 10 percent of normal. The six previous Julys (1982-1987) had averaged more than 200 percent of normal, a pattern that fire experts tried to anticipate in determining when it was necessary to suppress 1988 fires.

May and June natural fires behaved as fires had in past years: 11 went out on their own accord, and the rest showed no unusual behavior until well into July, when it became clear that the July rains experienced in previous years would not be repeated in 1988. After July 15, no new natural fires were allowed to burn unfought; after July 21, all fires were subjected to as full a suppression effort as available personnel and equipment would permit. As of that day, less than 17,000 acres were within the perimeters of existing fires.

An interagency fire fighting effort was initiated that eventually involved fire experts from all parts of the country, as many as 9,500 fire fighters working in the GYA at one time (and a total of 25,000 over the course of the summer), dozens of helicopters, more than 100 fire engines, and a cost of about 112 million dollars. On November 12, though the entire park was covered with snow, a few minor smokes persisted here and there.

Firefighters encountered conditions and fire behavior that most had never seen before. High winds caused fires to move with unusual speed, and made traditional fire fighting methods useless, even dangerous. Fire line

"Lessons from the Flames" is the title of the two-part series by Richard Monastersky in the Nov. 12 and 19, 1988 issues of *Science News* – the story of the Yellowstone fires as gleaned from NPS and other scientists. In an associated story in the Nov. 12 issue, Monastersky looks at NPS fire policy. In "Taking the Heat: A policy under fire," John Varley, head of Yellowstone research, is quoted as saying "Of course we're going to revise our policy. We just took a giant step forward in understanding fire behavior. That policy has evolved. It's not the same kind of dogma we adopted in 1972."

One of the fire chiefs in the park this year is quoted also: "There's going to be a new chapter in the fire behavior books ... and it's going to be a long chapter."

construction regularly proved ineffective, because wind-driven embers as much as two miles ahead of the main fire were creating hundreds of small "spot fires." Thus it was impossible to put fire crews directly in front of big fires because they might be caught between the main fire and its outlying spot fires. Fires would run 5 to 10 miles in a day, and then, because of unusually low humidity, would not "lie down" at night as fires most often do. Fires routinely jumped major topographical barriers, including the Grand Canyon of the Yellowstone River.

Aerial reconnaissance surveys conducted with infrared photography in September gave managers their first scientific estimates of burn acreages in the GYA. These were maximum estimates based on fairly coarse resolution 1:63,360 maps (smallest map unit – 200 acres); later mapping this winter and next summer will refine the numbers. A total of 1.38 million acres in the GYA experienced some sort of burning. Within Yellowstone Park, 995,000 acres were burned. Of that, 573,000 acres were canopy burn, 367,000 acres were surface burn (most trees over this surface burn will not die), and 55,000 acres of meadows and sage/grass-

An approximately hour-long videotape entitled "The 1988 Yellowstone Fires" is being prepared by Video Visions of Bozeman, Mont., in cooperation with scientists and resource managers who were involved with managing the Yellowstone fires. At press time the script was still undergoing last minute changes, but the tape was scheduled for completion by early spring. It can be ordered from Video Visions, P.O. Box 6721, Bozeman, MT 59715, for \$24.95, which includes shipping costs.

lands burned. This means that roughly one-quarter of Yellowstone will still be blackened by next June when visitors begin to arrive in numbers.

Considering the speed of some fires, losses of large mammals in the park were light. As of November 1, upon completion of an extended air and ground survey, 243 elk (less than 1 percent of the GYA's summering population of 32,000), 5 bison, 4 deer, 2 moose, and various smaller animals were reported killed, practically all by asphyxiation. Losses in surrounding national forests were similarly light. No threatened or endangered animals have been reported lost. Animals were routinely able to move aside when fires passed, and were caught only in extreme conditions of fast-moving fires.

This winter's controversies include numerous questions: Deciding whether or not to feed any animals due to burning of winter range; examining the timetables of suppression decisions; considering if and where reseeding should be done in the park; and evaluating the countless day-to-day decisions of the interagency fire fighting teams and the relations between the various agencies involved, whose philosophies of land management often differ. Any of these topics would require an article of its own even at this early stage.

Media attention caused enormous public confusion. All fires were routinely reported as "Yellowstone fires," and ascribed to the park's natural fire management plan (routinely misidentified as the "let-burn policy") when at least half of the acreage burned in the park was burned by man-caused or natural fires originating on national forest lands outside the park. All park developments except Grant Village, and all surrounding communities that were at any time threatened by fire were in fact threatened by man-caused fires not associated with the park's fire policy. Media reports consistently used fire perimeter acreages as actual burn acreages, though USFS and NPS daily reports cautioned that much land was unburned within perimeters. This misreporting gave the public an inflated idea of total burn acreage.

A detailed report, entitled *The Yellowstone Fires: A Primer on the 1988 Fire Season*, is available from the Superintendent, Yellowstone National Park, Wyoming, 82190.

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