

“BREWER FIRE MYSTERY” DISCUSSION

Editor's note: Occasionally, Fire Management Today publishes comments from readers on topics of concern, offering authors a chance to respond. To have your comments considered for publication, write to Managing Editor Hutch Brown at USDA Forest Service, Office of the Chief, Yates Bldg., 4th Floor NW, 201 14th St., SW, Washington, DC 20024, tel. 202-205-0878, fax 202-205-1765, e-mail: hutchbrown@fs.fed.us.

Reader Comment: “Brewer Fire Mystery” Not So Mysterious

Stephen A. Eckert

An article in the Fall 2002 issue of *Fire Management Today* mentions a blowup on the 1988 Brewer Fire in Montana that forced shelter deployment by the Wyoming Interagency Hotshot Crew.* The article states that “that there has never been an explanation for what triggered the Brewer Fire blowup.”

But what happened on the Brewer Fire is no mystery.

From 1982 to 1990, I was the fire control officer for the Bureau of Land Management, Miles City Field Office, Miles City, MT. From the outset of the Brewer Fire, I was the air attack supervisor. I also ordered the overhead team on the evening the fire started, and I was a member of the fire investigation team that later explored and reported on the shelter deployment incident.

In 1988, the drought in eastern

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* See Martin E. Alexander, “The Staff Ride Approach to Wildland Fire Behavior and Firefighter Safety Awareness Training: A Commentary,” *Fire Management Today* 62(4) [Fall 2002]: 25–30.

Montana was even more severe than during the Dustbowl. The recorded moisture was 3.35 inches (8.49 cm), compared to 5.11 inches (12.98 cm) per year in the 1930s. Normally, surface fires in open dry ponderosa pine forest stay on the ground; but in summer 1988, had you touched a lighted match to the pine duff, the flame would have easily crawled all the way up even the biggest yellow pine. Throughout that summer, winds that ranged from southwest to northwest were consistently and unusually strong, both during the day and in the evening.

So conditions were ripe for extreme fire behavior. They included record drought, record low fuel moistures, erratic and strong winds, extreme temperatures, and very low relative humidities. Under these conditions, the fire quickly went from a surface fire to a running crown fire. The hotshot crew was flanking the fire, building fireline. Had a lookout been posted in the meadow where the deployment took place, the crew would have had more time for escape or shelter deployment.

Under the severe burning conditions at the time, what happened on the Brewer Fire is no mystery. Instead, it was entirely predictable. Obviously, weather factors created an explosive environment. No other explanation is needed.

Author Response: What Triggered the Brewer Fire Blowup Remains the Mystery

Martin E. Alexander

First of all, I wish to state for the record that my mention of the Brewer Fire in my article (Alexander 2002) was in no way meant to criticize the people involved in fire suppression or the subsequent investigation into the shelter deployment incident. However, I do believe that Mr. Eckert has missed the point as to what “mystery” I was referring to in my article. I hope this response will clarify matters, and I appreciate the opportunity to elaborate on my initial thoughts concerning the Brewer Fire blowup.

My article was not intended to serve as a case study of the Brewer Fire. My sole purpose was to show how fire investigations are often rushed and the root causes of an incident on a fire (e.g., a fatality or near-miss) are often inadequately explored due to more pressing issues, in this case a rapidly escalating fire season in the Western United States. I wanted to support my call for creating wildland fire behavior research units.

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It is absolutely true that the critical level of dryness in live and dead fuels contributed to extreme fire behavior on the Brewer Fire. But the real question is this: What actually *triggered* the temporary escalation in extreme fire behavior on that particular evening in late June 1988?

We simply don't know. That is the mystery, not the fire as a whole, which is readily explainable. Certainly, other fires have burned under similar critically dry fuel situations over the years, and yet we haven't always seen events like those reported on the Brewer Fire.

I am a strong believer in not attributing unusual fire behavior to an "act of God." So I speculated that perhaps a heat burst (HB) was responsible for causing (i.e., triggering) the blowup or flareup that forced the Wyoming Interagency Hotshot Crew (IHC) to move away from the fire to a clearing and deploy fire shelters.

An HB is a recognized meteorological phenomenon (Bernstein and Johnson 1994; Johnson 1983). Perhaps HBs happen a lot more often than we think. We think we have studied our fire environments really well, but the truth of the matter is that we haven't—we just think we have. In the late 1950s, Mark Schroeder and Clive Countryman conducted a series of "fireclimate surveys" to begin collecting case histories or studies from which generalizations about the dynamics of mesoscale phe-

nomena could be made (Schroeder and Countryman 1960). A lot more work is needed. The meteorological conditions associated with the 1953 Rattlesnake Fire in California, which involved 15 firefighter fatalities, are a specific case in point (Maclean 2003).

The whole point of my bringing up the Brewer Fire was the need for thorough followup, because investigations are often rushed and we don't necessarily learn as much about what influenced a fire's behavior as we should or could have. As a result, we set ourselves up for the possibility of repeating the same scenario sometime in the future—perhaps with a fatal outcome.

I believe that mesoscale phenomena such as an HB should be looked into as a possible factor in the blowup of the Brewer Fire. An HB would seem to explain what happened. Associated with nocturnal thunderstorms, HBs are characterized by a sudden and dramatic localized increase in air temperature and a drop in relative humidity, coupled with strong, gusty winds. If we were to find that the Brewer Fire blowup was in fact triggered by an HB, we might in the future be able to use a sudden increase in air temperature—like the one reported by the Wyoming IHC foreman just before the blowup—as an "early warning system."

The possibility that an HB ultimately triggered (not set up) the Brewer Fire shelter deployment incident should, in my opinion, be

examined by a fire weather meteorologist using all the available data from both synoptic and mesoscale standpoints (e.g., upper air data, satellite and radar imagery, and hourly airport observations). Simply examining the data collected at a single remote automatic weather station might not necessarily suffice to detect an HB, because existing research suggests that HBs are so localized that they are not picked up at a single observation point on the landscape.

In closing, if extreme fire behavior was really so predictable on the Brewer Fire, then I must ask, with all due respect: Why was the Wyoming IHC allowed to be in such a dangerous position? To my knowledge, neither the fire weather forecast nor the fire behavior forecast mentioned the possibility of what transpired.

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THE TEN AND EIGHTEEN— A MEMORY AID



Fight Fire Aggressively,
Having Provided For Safety

FIRST



United States Department of Agriculture
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On the Cover:



One of a series of images by artist and firefighter Kari Cashen to help fellow firefighters remember the 10 Standard Fire Orders and 18 Watch Out Situations. See the story by Kathy Murphy beginning on page 4.

The FIRE 21 symbol (shown below and on the cover) stands for the safe and effective use of wildland fire, now and throughout the 21st century. Its shape represents the fire triangle (oxygen, heat, and fuel). The three outer red triangles represent the basic functions of wildland fire organizations (planning, operations, and aviation management), and the three critical aspects of wildland fire management (prevention, suppression, and prescription). The black interior represents land affected by fire; the emerging green points symbolize the growth, restoration, and sustainability associated with fire-adapted ecosystems. The flame represents fire itself as an ever-present force in nature. For more information on FIRE 21 and the science, research, and innovative thinking behind it, contact Mike Apicello, National Interagency Fire Center, 208-387-5460.



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