Wildland Fire Behavior Case Studies and the 1938 Honey Fire Controversy

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Over the past 90 years, fire research has contributed to our understanding of wildland fire behavior through laboratory and field experiments, physical and empirical modeling, numerical simulations, analyses of individual fire reports, and wildfire case studies. Although basic research on combustion is essential to a full understanding of fire behavior, such research would not be very useful without actual field experience gained and case study documentation (Brown 1959).

In general terms, what is a case study? Contributors on *Wikipedia* (<http://www.wikipedia.org/>) propose that case studies "provide a systematic way of looking at events, collecting data, analyzing information, and reporting the results." With the renewed interest in carrying out research on active wildfires (e.g., Lentile and others 2007a), it's worth reexamining the features of a good case study.

To this end, this article summarizes the findings from the case study of the controversial Honey Fire of 1938, originally published in *Fire Control Notes* by Olsen (1941)—one of the first comprehensive case studies of a wildland fire undertaken by fire behavior researchers. This account was reprinted in the Fall 2003 issue of *Fire Management Today*, the first of three special issues devoted to the subject of wildland fire behavior (Thomas and Alexander 2006).

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The Story of the Honey Fire

The story of the Honey Fire and the ensuing controversy is as much about human behavior as it is about fire behavior. In broad outlines, the situation was as follows. A fire behavior research crew happened upon a newly started wildfire, but rather than engaging in any suppression action, the crew began documenting its behavior. This course was taken partly because the crew had advance clearance to do so. The fire became one of the largest fires in the region that year and was finally contained by local fire suppression forces. The research crew's decision to not fight the Honey Fire raised some eyebrows. Later, a member of the research crew published a case study that not only analyzed the fire's behavior but also critiqued the actions of the suppression forces. That article, in turn, provoked a harsh outcry.

Synopsis of the Honey Fire Case Study

Chronology and Behavior

The major run of the Honey Fire took place on January 25, 1938, on the Catahoula Ranger District of the Kisatchie National Forest in north-central Louisiana (fig. 1). A total of 494 fires were to burn more than 12,800 acres (5,180 ha) on the Kisatchie National Forest in 1938 (Burns 1982), and the Honey Fire was one of the many human-caused fire occurrences that year. Interestingly enough, Burns (1982, 1994) did not mention the Honey Fire in her historical accounts of the Kisatchie National Forest.

The Honey Fire was the result of careless actions on the part of freight train employees disposing of burning waste along the east side of the Louisiana & Arkansas Railroad, approximately 1.5 miles (2.4 km) north of Bentley, LA, at around 9:50 a.m. The lookout at the Catahoula Tower, located 2 miles (3.2 km) to the east, detected the fire within 2 minutes, a very acceptable discovery time (Bickford and Bruce 1939b).

Carl Olsen, a forester with the Southern Forest Experiment

Timeline and Tactics

Initial Fire Behavior and Attack

The fire started at 9:50 a.m. on the east side of the Louisiana & Arkansas (L & A) Railroad (point A). Crew 1 (a pumper truck and 2 men) and Crew 2 (a fire boss and 12 men) were dispatched to the fire's presumed point of origin. When they arrived, the fire had a perimeter of 2,640 feet (805 m) and was spreading at about 360 feet per minute (110 meters per minute). Crew 2 began to work the north flank of the fire. The pumper truck could not be used because of wet ground and was redeployed to join Crews 3 and 4 (a total of 31 men), who had started backfiring along the west side of Tower Road. The fire boss then split Crew 2, taking five men (Crew 2A) overland to the west firebreak, and leaving seven men (Crew 2B) at the north flank. By 10:30 a.m., the fire reached the Civilian Conservation Corps (CCC) camp and Tower Road, where it was stopped at the line created by the backfires and the pumper truck. Crews 3 and 4 then joined Crew 2A on the west firebreak and began backfiring and attacking the north flank of the fire near the head. At 10:44 a.m., the wind shifted to the southwest, creating a new head (point B), which by 10:53 a.m. had spread to the west firebreak, where it was held by the backfiring operation; however, all of the constructed line on the north flank was lost.

Later Fire Behavior and Tactics

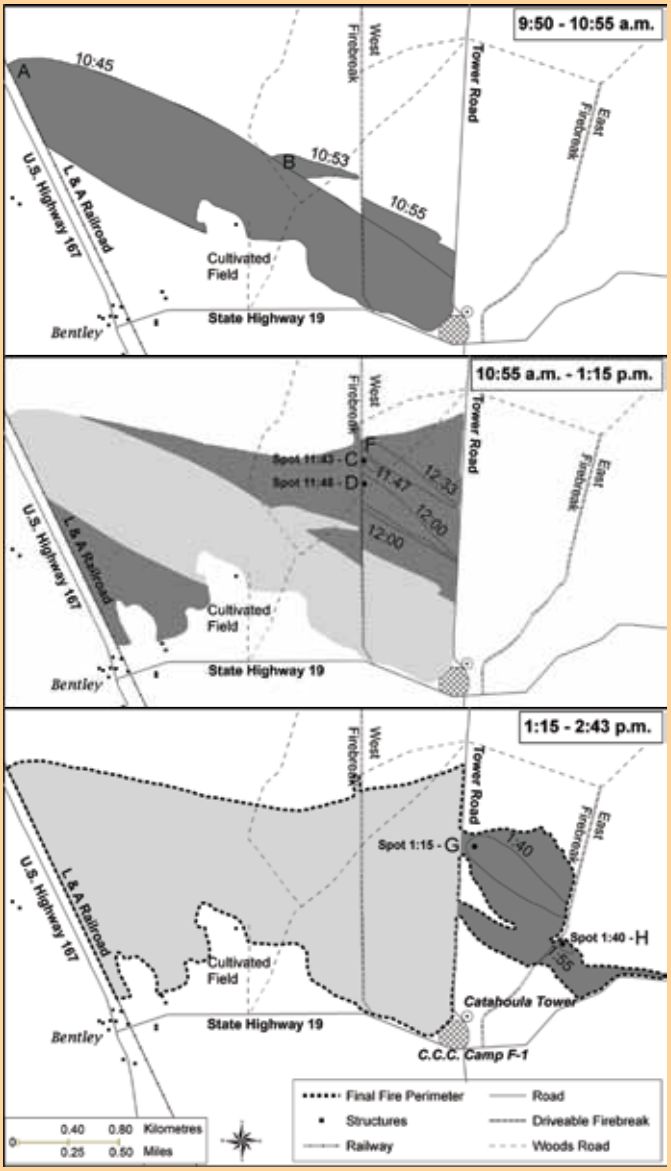
After the wind shift, the north flank, from the tail to the west firebreak (now effectively the head), was left to burn freely, which resulted in fire spread to and spotting across the west firebreak with new heads developing between the west firebreak and Tower Road (points C, D, and F). Crews continued patrolling and backfiring along the east and west firebreaks, Tower Road, and Highway 19. The south flank of the fire was stopped by patrols (22 men), a cultivated field, backfiring against Highway 19, and a wind shift to the southwest.

Final Attack

During the final attack on the fire, crews reinforced the backfires on the Tower Road and east firebreak (although spot fires at points G and H occurred across the Tower Road and east firebreak) and worked the north flank from the rear or tail of the fire to the head, mopping up as they went, aided by the pumper truck and additional crews. The fire was contained at 2:43 p.m. by a force of 19 supervisors and 129 men. The fire was mopped-up and declared out some 4 hours later.

Suggested Strategy and Tactics

Olsen made many positive comments on preparedness, dispatch time, equipment, and crew morale under trying conditions. However, he felt that, given the extreme fire behavior during the fire's initial run, indirect attack by backfiring was the only feasible control measure and valuable time had been lost in direct attack at the point of origin. He suggested that if the pumper truck and crews 2, 3, and 4 had begun aggressive backfiring earlier along the west firebreak, the fire might have been held there. He also suggested that the fire boss and crew leaders should not have worked directly on the line alongside their crews, but should have been more engaged in directing and managing the firefighting operation.



Maps of fire progress and summary of fire suppression activities and general fire behavior associated with the major run of the 1938 Honey Fire (adapted from Olsen 1941).

Station of the Forest Service, and three others (A.H. Antonie, R. Brooks, and C.A. Bickford) were members of a research crew assigned to study the behavior of free-burning wildfires in the region (Harper 1937, Olsen 1938). Normally, the crew was dispatched with initial attack forces. However, in the case of the Honey Fire, the crew happened to arrive on scene (at 9:53 a.m.) within 3 minutes of the fire's origin; they had been traveling about a mile (1.6 km) behind the train south along U.S. Highway 167, which ran parallel to and west of the railroad tracks (see description on previous page).

Within 2 minutes of happening upon the initiating fire, the four-person crew began mapping the fire perimeter (fig. 1) in order to determine rates of fire spread and fire size, collecting fuel and soil samples for analysis of moisture content, recording fire weather data, and making notes on various fire behavior characteristics (e.g., flame size and spotting distances). Unfortunately, to our knowledge, the crew took no photographs during or immediately after the fire. The technology of the time would not likely have permitted the research crew to have radio communication with the local fire suppression organization (Gray 1982).

At one point, the Honey Fire advanced almost 2 miles (3.2 km) during a 30-minute interval following ignition, and the fire eventually burned a total area of 1,092 acres (442 ha) before containment at 2:43 p.m. on the day of origin. The Honey Fire's documented rate of advance ranged from 330 to 463 feet per minute (101 to 141 meters per minute). Spot fires over 200 feet (61 m) in advance of the main head were observed. Computed fireline intensities, determined after the fact and based on these observed spread rates and estimated fuel consumption, ranged from 6,660 to 9,295 British thermal units per second per foot (23,050 to 32,170 kw/m) with corresponding flame lengths averaging 26 to 30 feet (8 to 9 m) (Byram 1959). However, flames at the head of the fire "frequently reached out in long tongues extending 100 feet [30 meters] or more" (Olsen 1941), no doubt in response to momentary gusts of wind (table 1).

When should the observer drop the camera and notebook and pick up a shovel or pulaski?

Environmental Conditions

The fire started in an area that was "typical of open cut-over longleaf pine land in the Upper Coastal Plain" (Olsen 1941), the predominant fuel being a heavy stand of cured broomsedge grass (*Andropogon* sp.) resulting from more than 3 years' accumulation. Available fuel loads would have been in the order of 3.4 tons per acre (7.6 tonnes per hectare), based on the sampling carried out by Bruce (1951).

Although air temperatures were considered "crisp" at 45 to 50 degrees Fahrenheit (7.2 to 10 degrees Celsius), moderately low relative humidities prevailed (26 to 33 percent). The moisture content of the fine, dead, fire-carrying fuels was determined to be about 12 percent. Winds were moderately strong and gusty (table 1), and shifted about 90 degrees, from northwest to southwest, during the initial major run.

Fire Suppression

The Civilian Conservation Corps and Work Projects Administration provided 129 firefighters and 19 supervisory personnel for suppression duty on the Honey Fire. They used a single 350-gallon (1,325-L) pumper truck along with the standard fire tools of the day—swatters or flaps (Sykes 1940), backpack pumps, fire rakes, fusees, and axes. Some photographs illustrat-

Table 1—*Onsite wind speeds measured during the major run of the 1938 Honey Fire (adapted from Olsen 1941)*

Duration and exposure	mph	km/h
Average at 3.5 feet (1.1 m) above ground	9.7	15.6
Average at 20-foot (6.1-m) open standard	15	24
Average at 33-foot (10-m) open standard	17	27
Maximum 1-minute average at 3.5 feet (1.1 m) above ground	16.6	26.7
Maximum 1-minute at 20-foot (6.1-m) open standard	25	40
Maximum 1-minute at 33-foot (10-m) open standard	29	47

Note: The 20-foot (6.1-m) and 33-foot (10-m) open wind speeds used for fire danger rating and fire behavior prediction in the United States and Canada, respectively, were estimated from the observation at 3.5 feet (1.1 m), as per Lawson and Armitage (2008).

A Suggestion To Help Improve Fire Suppression Tactics*

The morale and determination of all men were excellent, and in many cases remarkable. Virtually all of them used their flaps and backpack pumps effectively, showing that the training they had received was very much worthwhile. During the hot flank attacks, however, the flapmen [i.e., firefighters using swatters that are commonly used in containment of grass fires] relied heavily upon the pumpermen spraying water to knock down the flames. The men should be trained to rely less upon water in fighting the flanks by having the crew leaders temporarily stop suppression and rest the crews when the wind shifts on a flank, resulting in a very hot fire to fight. More line on the flanks will be extinguished and held by resting a crew while the fire is burning intensely and then efficiently directing them when the heat and flames have diminished.

Two firefighters attack a spot fire in 4-year-old rough using swatters or flaps, South Carolina. Photo: George K. Stephenson, Forest Service, 1944.

Firefighters use backpack pumps and a swatter or flap on a small grass fire, Georgia. Photo: Clint Davis, Forest Service, 1942.

Civilian Conservation Corps crew undertaking suppression action on a wildfire with backpack pumps and handtools, Ozark National Forest, Arkansas. Photo: Bluford W. Muir, Forest Service, 1938.

*Excerpt from Olsen (1941).

ing firefighting scenes of the era and general geographical location associated with the Honey Fire are presented here.

Communication on the fireline would have been difficult under the circumstances. There would have been no radio communication capability between the local district office and the fire boss or among the fire suppression crews (Gray 1982).

In addition to observing and recording the fire's development and chronology, Olsen's crew documented the fire suppression activities and the fire's resistance to control (e.g., arrival time, suppression tactics, amount of constructed and held line, and general difficulties experienced by the firefighters). No firefighters were killed or injured during the Honey Fire, but Olsen (1941) acknowledged that, after the wind shifted, "the danger of a crew getting trapped by the high, oncoming flames was great" along the left flank of the fire.

The Controversy That Followed

Roy Headley, who served as head of fire control for the Forest Service from 1919 to 1942, was interested in analyzing the accounts of large fires for the lessons that they might provide. For the year 1938, the Honey Fire was the third largest of the 13 Class E fires (fires greater than 300 acres [121 ha] in size) in the Southern Region of the Forest Service and 1 of 5 large fires on the Kisatchie National Forest. A little more than a third of the area burned by the Honey Fire had been planted with slash pine seedlings about a year earlier. Wildfires had been and continued to be a chronic problem for the reforestation pro-

Lessons Learned in Large Fire Management*

Such an infinite variety of problems are involved in the management of large fire jobs that thoughtful men seldom fail to learn from each one something which should be guarded against in the future, something which should be done differently, some cherished belief which must be modified or abandoned. For 35 years I have been working on or observing suppression jobs, but I still learn something from every fire I reach.

Sometimes, alas, we "learn the same lesson over and over"—or do we? For example, I have learned throughout many years that there is some flaw in our management of larger fires which keeps us from getting a reasonable output of held line from a crew of a given size. Plenty of other people have learned the same thing. But, untrained as we are in the science and art of management, we have not found ways to act satisfactorily on what we have learned. Our learning has too often failed to lead to productive action.

Roy Headley, circa 1942. In "Re-thinking Forest Fire Control," Headley (1943) summarized the lessons he had learned from a long and distinguished career in fire control administration with the Forest Service. Photo: courtesy of Stephen J. Pyne, Arizona State University.

The first essential in such matters is to grasp the need for change, the nature and importance of a problem, the chance to introduce something better. With that fact in mind, the outline for 1938 reports on larger fires requested a record of lessons learned by the man or men who had most to do with each fire. Some of the most suggestive answers received are quoted in this article. … All fire-control men may benefit by the lessons learned on these fires. Perhaps these notes will help reduce the number of times lessons have to be "relearned" by different men—or by the same men.

*Excerpt from Headley (1939a), which was published when Roy Headley headed the Division of Fire Control, Forest Service, Washington, DC.

gram that began in 1930 when the Kisatchie National Forest was first established (Burns 1982, 1994).

In his analysis of the Honey Fire, Headley (1939b) felt that the fire boss had failed to recognize the severity of the burning conditions that prevailed at the time and thus failed to select an appropriate strategy and tactics for containing the fire, namely backfiring from existing roads and firebreaks (Cooper 1969; Riebold 1956). Yet as Cheney and Sullivan (2008) have rightly pointed out, there are inherent dangers with backfiring that limit the chances of success. At the time, the fire boss was required to rely solely on his general knowledge and experience; no guide to judging fire potential relevant to the fuel type was available at the time. Less than 2 years later, Bickford and Bruce (1939a) produced what evolved into the Coastal Plain Forest Fire Danger Meter for the Southern and Southeastern United States (Jemison and others 1949).

Olsen and his fellow crew members were criticized for not immediately attempting to suppress the fire. However, the forest supervisor had previously agreed that this research crew was free of any obligation to undertake any fire suppression action so that the best possible fire behavior data could be obtained. It's unlikely that they could have done much anyway: "With two fences and a railroad between them and the fire, there is no doubt that their truck was unusable on this fire" (Olsen 1941). Furthermore, when the research crew arrived on the scene, the fire had already advanced more than 100 feet (30 meters) from its point of origin and "was very definitely too big for them to hold with hand tools alone" (Olsen 1941).

Olsen's (1941) account of the Honey Fire included considerable commentary on the actions taken by fire suppression personnel in addition to his description of fire behavior and the associated fire environment. This commentary was presumably in part the result, according to the editor of *Fire Control Notes* at the time, of a board review held by the regional forester that provided additional information to the Southern Forest Experiment Station for use in its study of the Honey Fire (Olsen 1941).

Olsen (1941) indicated that one of his objectives in publishing his case study was "to offer constructive criticism and suggestions as a guide in planning suppression action for future fires burning under similar conditions." He also offered many positive observations.

Despite his good intentions, Olsen was criticized in an article published in 1942 in *Fire Control Notes*. Barry (1942) chastised the fire behavior research crew for not attempting to control the fire; he also deemed it inappropriate for fire research personnel to analyze or critique the efforts of the fire suppression personnel involved after the fact. Further, Barry asserted that such actions could have serious repercussions on the image and morale of the organization and that only those fires that had escaped initial attack should be the subject of fire behavior studies.

Reflections

Wildfire case studies are invaluable in providing fire behavior data for developing and evaluating fire behavior models (e.g., Pearce 2002, Townsend and Anderson 2006) and as a source of training material (Alexander 2002). The recent report on the 2006 Billo Road Fire in New South Wales, Australia, by Cruz and Plucinski (2007) is a good example of this traditional role of wildfire case studies. Documentation of the effects of fuel treatments on fire behavior in relation to fire suppression effectiveness (e.g., Murphy and others 2007), highlighting firefighter safety incidents (e.g., Pearce 2007), and fostering institutional memory of local, historically significant fires (e.g., Ward 2005) represent other valuable contributions. Case studies of prescribed fires (e.g., Alexander 2006) are just as valuable as their wildfire counterparts. A combination of case study knowledge, experienced judgment, and simulation modeling of fire behavior is seen as the most effective approach to appraising fire potential and predicting wildland fire behavior (Alexander 2007, Alexander and Thomas 2004).

Lessons-Learned Analyses of the Honey Fire*

In this case the fault lies with the fire boss in his failure to recognize extreme fire conditions that existed on January 25, and to modify his attack to fit these extreme conditions. If he had recognized the danger, or had means other than his general knowledge and experience to guide him in selecting the correct method of attack, the fire would have been controlled much easier, and with a somewhat smaller acreage. Instead of attempting a direct attack, had he backfired all existing roads and firebreaks facing the oncoming fire, the fire would have been controlled at about 700 acres [280 ha] and the slash-pine plantation inside of the fence would have been saved. The amount of held line per man-hour would have been at least tripled. One answer is a well-constructed, fire-danger meter which will leave as little as possible to the judgment of the fire boss on the fire line.

The only method of controlling this fire at a smaller acreage after it had started would have been an immediate attack by the indirect method by backfiring. Under such conditions, tank trucks and specialized equipment are of very little value. A strip of burned ground at least 400 feet [120 m] wide is necessary to stop the heads of such a fire.

The fire was started by the L. & A. Railroad train which was temporarily stalled at the point of origin. The Louisiana State law requires that the railroad free their right-of-way from combustible material. The forest [Forest Service] has never been able to force the L. & A. to do this. The railroad officials have been warned, both in person and by letter, many times. Also, they have paid suppression cost and damages for other fires caused by their railroad. Railroad business is rather poor, and the officials took the attitude that they could not afford to keep rights-of-way clear as required by law. Reimbursement of damages and suppression costs amounting to $2,160.62 has been asked for.

Since this fire occurred, however, the railroad officials have decided it is cheaper to clear the right-of-way than to pay damage and suppression costs. Both the L. & A. Railroad and Missouri-Pacific Railroad Cos. have cleared their rights-of-way of combustible material within the forest boundary. For the first time in the history of the Kisatchie Forest, we will enter the 1938-39 fire season without the constant hazard of railroad fires.

Fusees used for backfiring in some of the tool boxes had absorbed enough moisture from the air to be worthless. The wet or damp fusees could not be detected by casual examination. Some delay in backfiring was caused by these dud fusees. Fusees cost only about 9 cents a piece, and this failure could have been eliminated by simply replacing old fusees with new ones every 30 days.

*Excerpt from Headley (1939b), which was published when Roy Headley headed the Division of Fire Control, Forest Service, Washington, DC.

Criticism of the Actions of the Wildfire Behavior Documentation Crew on the Honey Fire*

A reading of the article by C.F. Olsen, entitled "An Analysis of the Honey Fire," in the October 1941 issue of *Fire Control Notes*, brings to attention a situation hard to imagine. Of course, it is practically impossible for us at this remote location to visualize all the factors; nevertheless, after making generous allowances, I still experience an unpleasant jolt when I think of what happened.

There were two branches of the same department involved in the suppression of a fire, one interested in determining how the fire would behave on a bad burning day, the other charged specifically with the responsibility for stopping its spread.

The branch interested in behavior arrived at the Honey Fire first, 3 minutes after its origin according to the article. A four-man fire-behavior crew had been traveling on a paralleling highway about a mile [1.6 km] behind a train that stopped to service a hot box. The train crew carelessly threw some burning waste into dry grass and the behavior crew happened along 3 minutes later. They found it "definitely too big for them to hold." The decision of the fire-behavior crew—equipped with a car having various fire-fighting tools—to refrain from an attempt to check or retard the spread of this fire when it was approximately 100 feet long is hard to understand. We would expect more from four untrained men off the street as a quality of citizenship. Forest Service guard-training instructions have emphasized for years that there is always something that even a single guard can do to retard the spread of a fire, although it may be obvious that a frontal attack is impossible. The failure to make some attempt in that direction on the part of this fire-behavior crew indicates that they did not believe in such a theory. Won't the morale and fighting spirit of our temporary guards be lessened by such an example? The public, too, may find such action, or lack thereof, confusing.

If the fire-behavior crew admitted that they were unskilled in fire fighting and limited their report to factors of weather and rate of spread, their disregard for attempting control action could be overlooked to some extent.

The fact that suppression foremen, who apparently did their best to stop this fire, were subjected to criticism by such men indicates an oversight in personnel management that cannot help but decrease spirit and morale in a marked degree. Moreover, the fire-behavior crew has been permitted to make capital of their questionable action by printing the results of their study.

There is no quarrel with the policy of conducting fire-behavior studies, and the men assigned to that duty should not be expected to take part in the suppression work on fires that have escaped first control efforts. However, there should be no tolerance of a policy permitting an organized crew of men to travel about the country looking for fires to study unless they are willing to lend a hand in an effort to check the spread of small fires pending the arrival of regular suppression crews.

It is hoped that in the future this fact will be made clear to all, so that even though a fire cannot be entirely stopped, it may be retarded, thereby permitting arriving suppression crews to handle it more easily. That kind of action will make far better reading than the one referred to above, and the results after the fire is out will go far toward strengthening the spirit and morale of the whole organization.

*Excerpt from Barry (1942), which was published when E.F. Barry was a staff assistant on the Flathead National Forest, Northern Region (Region 1), Forest Service.

The value of the fire behavior documentation of the Honey Fire that Olsen (1941) provided is unquestionable. As Van Wagner (1971) has pointed out, "some valuable reference data can be collected by being at the right place at the right time" through wildfire monitoring and documentation. This is especially true during periods of extreme burning conditions, which are often impractical or impossible to simulate with outdoor experimental fires, in the laboratory, or by computer simulation. At the time, Olsen's article was the most comprehensive published wildfire case study of its kind. Over time, many others have used his data and information in their own fire research studies and for other purposes,

On Wildfire Case Studies and Firefighter Safety

I confess that I like case studies. They are the kind of thing historians are used to dealing with. We don't expect to find general laws: we accept the particularity of experience. Moreover, the case study is a story. That's why I think it's especially useful for safety. Nobody remembers guidelines the way they remember a story, which is the next best thing to actually experiencing the events.

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including the present article. For example, the Honey Fire was one of five wildfires that Anderson (1983) used to evaluate his two elliptical fire shape models.

Olsen's (1941) documentation of the fire suppression decisions and actions on the Honey Fire are also valuable, though controversial. His case study analysis of the Honey Fire provides lessons for fire managers and researchers alike and raises issues that are still pertinent today, including some of the following ethical questions:

- Should case studies document fire control activities as well as fire behavior and compare model predictions and accepted knowledge against observations?
- When should the observer drop the camera and notebook and pick up a shovel or pulaski?
- When is it appropriate for a researcher to critique the decisions and actions of firefighters and fire managers or analyze how a fire should have been suppressed?
- Is it incumbent upon researchers to raise questions and point out deviations from standard operating procedures and discuss potential reasons for doing so?

A clear understanding of what happened during a fire is often "hard to acquire because it is obstructed by the natural human desire to save face, fear of disciplinary action, fear of being made a goat, and lack of confidence in the competence and impartiality of men who may judge the record," as pointed out by Headley (1943). However, a case study is not intended for "taking people to task for errors in judgment, but solely to ensure that the lessons that have been learned contribute to the success of future fire suppression operations" (Luke and McArthur 1978).

Implications

The general value of wildland fire behavior case studies has been discussed at length (Alexander and Thomas 2003a, 2003b, 2006). However, case studies are commonly seen as the "poor cousins" of fire science, occasionally tolerated but seldom encouraged in the scientific and technical peer-reviewed literature, although exceptions do exist (e.g., McRae 1986, Noble 1991). This situation contrasts with that of other professions, such as engineering, medicine, business, and law, where case studies are well accepted (Henderson and others 1983). For example, the *New England Journal of Medicine* has published an ongoing series of case studies since 1923 (Falagas and others 2005) and the Harvard Business School is renowned for the use of the case study method in the classroom (McNair 1954).

On Criticism and Wildland Fire Suppression

The one contemporary issue that interests me most in this article is sensitivity to the concept of criticism—constructive or otherwise.

We still have not, I'm afraid, learned to use criticism to its full benefit. Many fire managers and leaders in today's firefighting ranks are especially fearful of criticism from official sources—especially as it relates to firefighter safety. After-action reviews, risk refusal, lessons learned, accident prevention analysis and other tools are being successfully used to counteract resistance to constructive criticism, but much more work is needed. It will always be so as long as firefighters remain a proud, self-assured bunch, and they want to control fires in risky environments.

The source and purpose of criticism is key here. The threat of "witch-hunts," real or imagined, will keep criticism a sensitive subject. Direct criticism from research is no exception, even with good intentions.

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We can only speculate whether the gain was worth the adversity that Olsen and his crew faced afterward.

Case studies can bring to light unusual or perplexing problems that might otherwise be neglected and, by telling a story, can ground what would otherwise be dry theory into a meaningful context (Hallenbeck 2005). However, case studies can be among the worst of the literature, offering few conclusions. Additionally, extrapolating conclusions from a single case is usually unwise, and attempting to solve a difficult case after the fact can become an exercise in self-aggrandizement (Hallenbeck 2005).

The role of the fire researcher as an independent observer established by Olsen (1941) and others more than 70 years ago continues to be used today. For example, current work by rapid-response researchers focuses on gathering data related to fire behavior and fire effects (Lentile and others 2007a, 2007b).

Similar activities have been undertaken in the past, especially in documenting free-burning fire behavior (e.g., Hardy 1983, USDA Forest Service 1993, Wilson and Davis 1988). In fact, Forest Service pioneer fire researcher Harry T. Gisborne is believed to have published the very first attempt at a comprehensive wildfire case study in his description of the Quartz Creek Fire (Gisborne 1927), which occurred on the Kaniksu National Forest adjacent to the Priest River Experimental Forest in northern Idaho during the summer of 1926; Kay (1927) published a less detailed documentation of several fires that occurred the following summer in Western Canada. This was followed by several other pioneering case studies in North America in the early 1930s (e.g. Jemison 1932, Dauge 1934, Shaw 1936).

Documenting or analyzing fire suppression strategies and tactics has not been undertaken as part of rapid response research to date, despite the fact that fire behavior may be influenced by fire suppression and that fire suppression actions are arguably an important part of the record. Although further analysis of human factors and activities on a fire opens the door to controversy, it may nonetheless provide valuable information and learning tools for fire managers. Taking a page from the *New England Journal of Medicine* and developing a mechanism to analyze and publish a regular series of peer-reviewed case studies of fire behavior and fire suppression activities would be a valuable addition to both the fire management and fire research professions. This would serve to complement the suggestion of creating operational wildland fire behavior research units (Alexander 2002).

Perhaps the idea of fire researchers critiquing human decisionmaking and actions would be viewed by fire managers as taboo, although there doesn't seem to have been any past reluctance to publish positive assessments (e.g., Countryman 1969, Kurth 1968, Scowcroft and others 1967). Nevertheless, we suspect a certain sensitivity still exists in having fire researchers second-guess fire operations personnel. This might be overcome in part by involving practitioners in the analysis.

Parting Thoughts

As fire behavior research professionals, we admire the determination that Olsen and others showed in their approach to systematically documenting the Honey Fire. It must have been extremely difficult for Olsen to complete his case study article in the face of the criticism that followed the control of the Honey Fire.

We can only speculate whether the gain was worth the adversity that Olsen and his crew faced afterward. Despite their express freedom to study fire behavior, the question of whether or not to engage in initial attack must have constituted a major moral dilemma. Obviously, the crew sincerely believed in the value of their research, and such dedication to the task is commendable. Would you have done the same?

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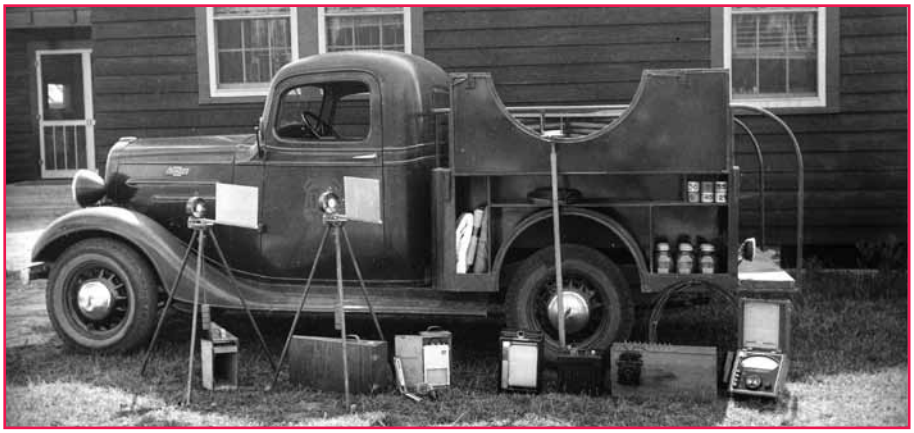

Vehicle and equipment used in fire behavior studies by fire research staff of the Southern Forest Experiment Station during the mid to late 1930s on the Harrison Experimental Forest, De Soto National Forest, MI. From left to right, the instruments are Foxboro pyrometer, thermocouple wire, thermocouple switch dial, storage battery, compass and Jacob staff, 8-pen thermograph recorder, portable recording hygro-thermograph, hand aspirated psychrometer, anemometer, and wood carrying case. In the truck compartments there are glass jars for fuel samples, cans for soil samples, a chain, and cloth of varying colors for plot markings. Photo: T.T. Kohara, Forest Service, 1937.

Remembering (or Discovering) the 1988 Yellowstone Fires

Any member of the wildland fire community younger than 21 years old was not even born when the Yellowstone fires of 1988 took place. And many of those who were involved have since gone on to retire from active service or are about to. Thus, a report recently published by the Wildland Fire Lessons Learned Center (WFLLC) will no doubt be of value to both generations in remembering, or in fact discovering, the past. The WFLLC report is entitled "The 1988 Fires of Yellowstone and Beyond as a Wildland Fire Behavior Case Study" and was written by Dr. Marty Alexander. This report is based in part on the opening remarks made by the author at the fire behavior fuels and weather session of The '88 Fires: Yellowstone and Beyond conference held 22–27 September 2008 in Jackson Hole, WY. Dr. Alexander served as the co-organizer and co-moderator of the session. A copy of the WFLLC report is available for download at: <http://www.wildfirelessons.net/documents/alexander_Yellowstone88_FB.pdf>.

A crowning forest fire begins to descend upon the Old Faithful complex in Yellowstone National Park on September 7, 1988. Photo: Jeff Henry, National Park Service, courtesy of the Yellowstone Digital Slide File.