

MISSING WARNING : A RESPONSE

In his letter of April 10, 2001, Chick Keller has attempted to describe the events during the Cerro Grande fire; but, I feel that his lack of experience in fire behavior and lack of definitive knowledge of the fire spread from May 5 through May 10 have led to a misleading description of events leading to the fire outbreak on May 10. I hope that this letter will clear up some of these misunderstandings.

The prescribed burn begun by the National Park Service on May 4 was intended to burn the upper Frijoles drainage above State Road 501 in a three phase effort. The prescribed burn went well (with the exception of a slopover and a couple of spot fires at the head of Water Canyon on the afternoon of May 5.) The prescribed burn continued with the fire burning downhill to the southwest until about noon on May 7. At that time the fire jumped SR 501 about 1/4 mile east of the Graduation Flat intersection and moved into Frijoles canyon. The last Park Service progressive fire map I have shows that the fire began a spotting run up the east side of the Frijoles drainage at about 5 p.m. on May 7. This outbreak was aided by rising winds from the SW that were in advance of the cold front that passed through the area on May 8.

A progressive fire map has been published that shows the approximate fire boundary at midnight and at other times of each day of the fire. This map is based on infrared aerial photography and on detailed reports from fire crews. On May 8 the fire burned across the head waters of Water canyon, crossed Valle canyon and reached SR 501 in the vicinity of the Six mile Mesa road. This advance was on a nearly mile wide front. By midnight on May 8 the fire had burned north along the west side of SR 501 and some distance west along Camp May road. The fire burned with very high intensity and left the heavily burned strips on the north side of the ridge north of Valle canyon. When the fire reached the Ponderosa Pine forest within 3/4 of a mile of SR 501 it slowed down and burned primarily grass, brush, debris and small reproduction. The relatively mature pines were not seriously damaged in this area and are still green in mid April 2001.

On May 9 the winds subsided and the fire burned south from the May 8 boundary toward Water canyon and to the north west up the southern exposure of Pajarito Mountain. The fire expansion on May 9 varied in intensity depending on fuel type and concentration. In the lower Ponderosa pine forest it burned with light to moderate intensity and left a significant number of trees alive. In the higher mixed conifer forest the fire burned with moderate to high intensity and destroyed most of the vegetation. I assume, based on my 11 years of working in fire control, that the crews were engaged in extending fire lines, attempting to blunt the edge of fire expansion and removal of fuel by burning of materials within the general fire area on May 9.

The use of a back fire (backburn) in fire control is primarily restricted to action films produced by Hollywood. Fire schools have long taught that a fire is controlled by using controlled measures. Fire is separated from fuel by mechanical means such as digging a fire line, oxygen is separated from fuels by covering the materials with dirt and (where possible) heat is removed by cooling with dirt or water. As a fire line is constructed, the fuels within the line are burned with low intensity fires.

The concept of a backfire is that a large fire will create a strong wind into the fire and that a secondary fire can be created that will be driven by the winds of the main fire toward the main fire thus burning all of the fuels and robbing the main fire of oxygen. A backfire is such an uncontrolled and dangerous measure that even the suggestion that this method should be used will usually get you sent to the showers a long distance from the fire line. A backfire will never work when a fire is being controlled by external winds.

Several of us watched the events of the morning of May 10 from a vantage point atop the old restaurant

building at the Main Gate. At 8:00 am the general fire area was fairly calm although it was difficult to see too much detail because of the smoke near the fire area. We could see fire retardant being dropped in the general area of the Back Gate and near the top of Pajarito mountain. At about 9:00 am flames were beginning to show near the switchbacks above the Back Gate and the smoke density was growing in that area. The winds were generally from the southwest and were so strong that it was sometimes difficult to stand on the roof of the building. A second cold front with higher intensity winds was moving in the direction of Los Alamos. Smoke from the Water canyon fire was passing directly above the Main Gate and was sinking into the valley. The smoke in the general area of Pajarito mountain was increasing but I felt that the increase was consistent with that induced by decreasing humidity, increasing winds and increasing temperature.

The fire in Water canyon continued to grow throughout the morning despite the efforts at control. At around 11:30 am, a column of smoke began to grow in the vicinity of Nevershine Corner on Camp May road. The winds were increasing in strength but at that time the smoke continued to drift in a generally north east direction. The air turbulence was becoming extreme in the vicinity of the mountains. The lead aircraft reported losing altitude at 3000 feet per minute. I should remind the reader that if you are flying at 1000 feet above the trees in a 3000 ft per minute downdraft you have only 20 seconds to react and get your aircraft under control. If you are flying at tree top level and you hit a downdraft of this magnitude you are most probably dead. Air operations were ceased at about this time. At some time between 12:00 pm and 1:00 pm, the wind shifted to a more northerly direction along the Jemez mountains and the smoke from the exploding fire at Water canyon was directed to the north at ground level. During the afternoon of May 10, sustained winds of 50 mph with gusts to 70 mph were recorded at the Los Alamos airport.

No matter what the source of the fire blowup at the Back Gate, that fire DID NOT advance to the north and cause the fire to cross Los Alamos canyon. For this event to have occurred the fire would have had to crown in the pine forest, since the fuels on the forest floor were consumed on the 8th and 9th. The pine forest along the west side of SR 501 is still green for the most part. The Water canyon blowup did spread the fire across SR-501 leading to the fires that burned over much of LANL.

From my vantage point at the Main Gate, it appeared that the fire that crossed Los Alamos canyon had its point of origin as a separate blowup that took place in the vicinity of Nevershine Corner on Camp May road. The column of smoke from this area suddenly increased at about 1:00 in the afternoon. The smoke column changed from bluish white to reddish black indicating that a major blowup was beginning in a dense green forest (the south side of Los Alamos canyon). By about 1:15 pm (when the evacuation order was given) the smoke from Water canyon blowup and the Los Alamos canyon blowup had merged giving the impression of one vast expanse of fire when in reality there were two smaller blowups that were several miles apart.

Did the fire overhead do the right things considering the wind, topography, fuel and moisture conditions? From my viewpoint as a wildland firefighter with 11 years experience as a Smokejumper, I do not have any major misgivings about the command and command structure. My fire experience and the Rules of Engagement of wildland fires were shaped by the Mann Gulch fire in 1949. In this fire, 12 Smokejumpers and a ground crewman were killed in a blowup similar to the ones on the 10th at Cerro Grande. The Rules of Engagement were changed after the South Canyon (Storm King Mountain) fire in 1994. South Canyon killed another 14 Smokejumpers and Hotshots and resulted in even greater caution in the attack of wildfires. I have nothing but complete admiration for the firefighters that kept the Cerro Grande fire from spreading further down Los Alamos canyon than it did on May 10. Entering a steep, fuel filled canyon with heavy wind conditions and very low fuel moisture is tempting the Dragon for an easy meal. Those firefighters preserved the rest of the town.

Prediction of the magnitude and spread of a wildfire is a difficult problem. In order to describe a fire such as the Cerro Grande fire at resolutions of a few hundred yards with any degree of certainty, the details of topography; fuel type, distribution, moisture content, energy content and size; as well as a detailed modeling of wind conditions must

be provided as input parameters at much smaller resolution than is reported as a final result. Modeling of wind patterns in the vicinity of a topographic unit such as the Jemez mountains has progressed to the point that the wind patterns in a mesh of a few tens of miles are predicted and presented by television weather forecasters such as Larry Rice of KOB TV. His models can predict the surface winds in the Los Alamos area with a fair degree of accuracy. My suspicion is that the Water canyon blowup created a major disruption in the wind pattern formed by the jet stream. This disruption was probably in the form a wind swirl over the area from the Back Gate to Armistead Springs. Anouther result of this swirl was that the surface winds were directed to the north along the east side of the Jemez mountains. The blowup in Los Alamos canyon may have created a second wind swirl that continued this redirection of the overall winds in a northerly direction. The net result appears to be the prevention of an even larger disaster than the one which did occur.

Could the fire have been held in check on the afternoon of May 10? I have seen worse fire situations held and I have seen lesser fire situations lost. A single shovel full of dirt applied at the right time might have made the difference. The fighting of a major project fire is a direct analog of a battlefield in war. An army of several thousand firefighters has taken the field. The Generals may lay out the overall strategy but it is the Lieutenant in charge of a platoon and initiative of a single man in that platoon that may turn the battle. Monday morning quarter backing of the work of serious, trained professionals is easy but it is seldom productive.

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There are a number of sources of information on wildfires that may interest the serious reader. Web sites that provide links to a broad range of information are:

<http://www.Smokejumpers.com>
<http://www.Dragonslayers.com>

For a greater appreciation of the dangers that are faced by wildland firefighters, I would recommend:

Norman Maclean "Young Men and Fire" , Univ. Chicago Press (1992) ISBN 0-226-5061-6. A very complete investigation and discussion of the Mann Gulch fire.

John N. Maclean "Fire on the Mountain", William Morrow and Company (1999) ISBN 0-688-14477-2. A very complete discussion of the South Canyon fire.

For a greater appreciation of the consequences of the decisions that must be made in a disaster situation I would recommend:

Stephen L. Harris "Fire and Ice -The Cascade Volcanoes" Pacific Search Books (1976) ISBN 0-916891-39-2. Chapter 20 is a fictional account of an eruption of Mt. Shasta and the interactions between people and government that results during that eruption.