

Fire Behavior, Fuel Treatments, and Fire Suppression on the Hayman Fire

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The Hayman Fire started on June 8, 2002, about 1.5 miles southwest of Tappan Mountain on the south side of County Highway 77, in Park County, Colorado (fig. 1). It was first reported at about 1 acre in size at approximately 1655 hours (appendix C). An aggressive initial attack response consisted of air tankers, helicopters, engines, and ground crews, but they were unable to contain the fire. Torching trees and prolific spotting advanced the fire to the northeast across U.S. Highway 77 by 1831 hours. The entire Front Range of Colorado was predisposed to potential extreme fire behavior by the unusually severe drought conditions this year. The unusual moisture conditions were exemplified by the low moisture contents (3 to 7 percent) of large dead woody fuels (100 hour, 1000 hour) and duff, and conifer foliage (84 to 111 percent). Little or no new growth appeared on peren-

nial grasses and brush, and terminal buds did not elongate or flush on some conifers. Weather at the time of ignition consisted of high winds (from the south averaging 18 mph, with gusts to 33, Lake George RAWS station, appendix A) and low humidity (9 percent) that facilitated rapid fire spread rates, crown fire, and spotting. Fuels across the landscape were generally continuous, with no recent wildfires or fuel management activities occurring downwind of the ignition location for perhaps 10 miles. Surface fuels generally consisted of ponderosa pine duff and needle litter, short grass, and occasional patches of brush. Low crowns of the predominating conifer species (ponderosa pine, Douglas-fir, and blue spruce) facilitated transition from surface to crown fire.

By the following morning (June 9), the fire was estimated at 1,000 to 1200 acres in size (0806 hours,

In Memoriam

Paul Gleason, a member of the Fire Behavior, Fuel Treatments, and Fire Suppression Analysis Team, passed away on February 27, 2003. At the time of his death, Paul was a member of the faculty at Colorado State University, Department of Forestry and Natural Resources. Prior to his teaching association with the university, Paul worked for the USDA Forest Service and USDI National Park Service in a career that spanned 35 years, including 23 seasons with the Interagency Hotshot Crew programs on the Angeles, Mount Hood, and Pike and San Isabel National Forests.

When reflecting on his career as a hotshot, Paul said, "One of the enjoyments of that job is to go into chaos and made sense of it. And this 'sense' is to do effective fire management and safe fire management work simultaneously within this environment." Paul's desire to make sense out of the chaos and provide for firefighter safety led him to develop the principles of LCES used by wildland firefighters nationwide.

Paul's work and interaction with the team demonstrated, as always, that Paul was indeed "a student of fire."

Paul and his contributions will be missed by the team and the wildland fire community.

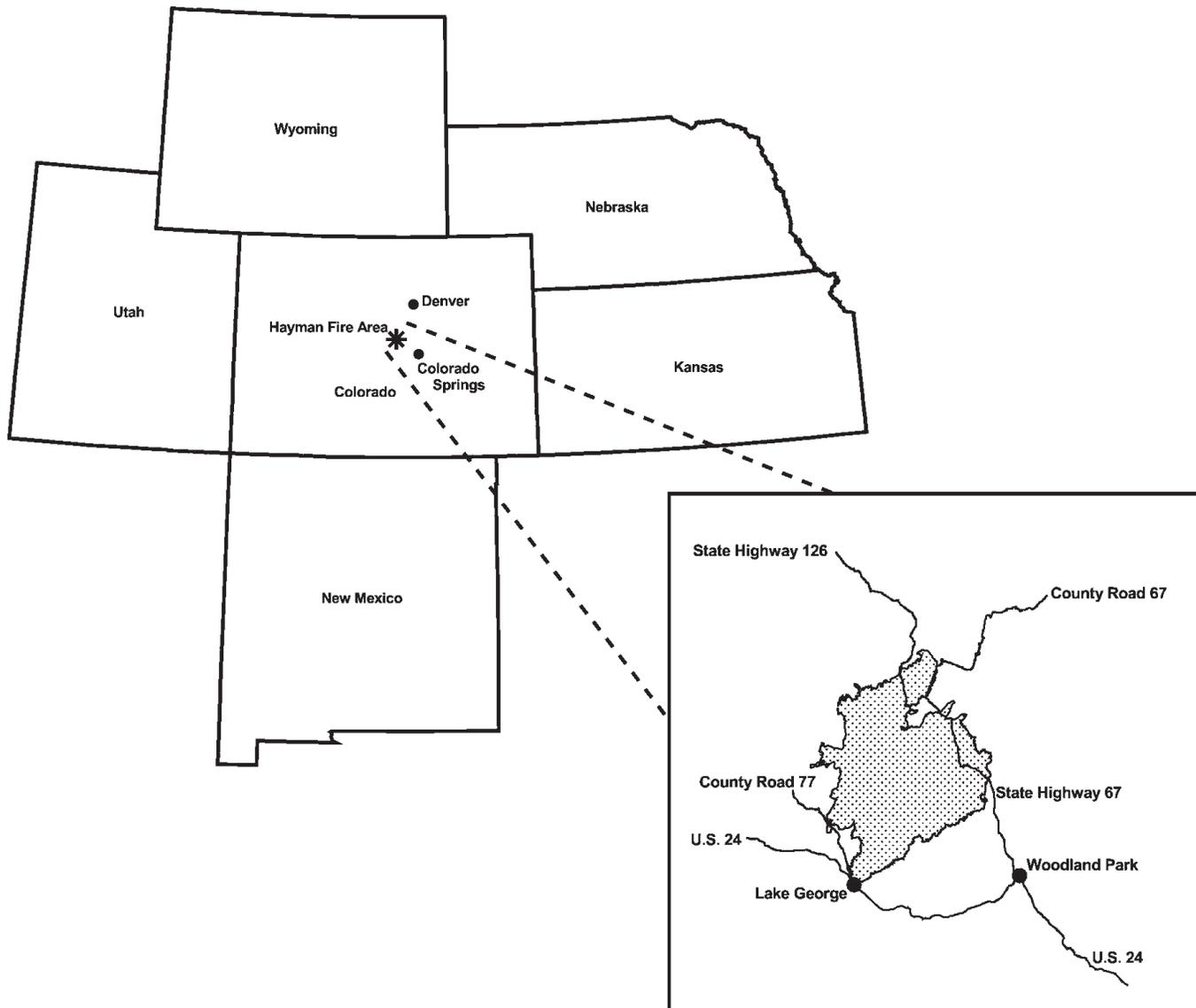


Figure 1—Location of Hayman Fire in Colorado. Fire started on south side of County Road 77 in the southwest corner.

Pueblo Interagency Dispatch Log) in the Tarryall Creek drainage west of the confluence of the South Platte River. This positioned the fire for a major run lasting the entire day and burning 60,000 acres along the South Platte River corridor for 16 to 19 miles. The general alignment of the gradient wind direction (SW) with the orientation of the Platte River drainage enhanced the spread of the fire to the northeast. Extreme weather conditions continued that day. Winds gusting to 51 mph from the southwest and humidity hovering around 5 to 8 percent were recorded at

nearby RAWS stations. Evacuations were performed in front of the fire, but no suppression actions were possible forward (east) of U.S. Highway 24. Fire behavior was described by long crown fire runs and long-range spotting (1 mile or more). Fire spread rates from approximately 1700 to 2300 hours averaged more than 2 mph. Pyrocumulus clouds developed to an estimated 21,000 feet. By the end of the day the fire encountered a number of landscape features that served to alter fire behavior. The head of the Hayman Fire acquired a forked appearance after burning on either side of Cheesman Reservoir. The eastern head of the fire stopped at the edge of the Polhemus pre-

scribed burn (October 2001) and was prevented from flanking west toward the town of Deckers by the earlier Schoonover wildfire (May 2002).

Moderate weather arrived the afternoon of June 10 and persisted until the afternoon on June 17. During this period, the fire advanced mostly to the south and several miles to the east. Burnout operations were conducted, and firelines constructed along most of the eastern and southern perimeter divisions. The fire encountered a number of prescribed burns as well as the Big Turkey wildfire (1998) along the eastern flank. Because of moderate weather conditions, most areas burned this period sustained only light to moderate overstory mortality.

Extreme weather returned on June 17 and 18. Fire activity increased across the entire east flank, driven by west-northwest winds. Fuel modifications with two prescribed burns and the Big Turkey wildfire (1998) limited the initiation of crownfire runs on June 17 along a 2 mile section of fire perimeter. The fire advanced to the east 4 to 6 miles on June 18, burning into Manitou Experimental Forest and across Highway 67. The fire made little progress after this because of the arrival of monsoon weather and moisture.

In the aftermath of the fire, our team was directed to address five questions. The questions were approached through the collection and analysis of data on five topics: fire climatology and meteorology, fire behavior, fuel treatments, road density, and fire suppression activities. The following reports address these topics.