

NFPA World Safety Conference and Exposition

2003

Dallas Convention Center, Dallas Texas

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SU-29

“Historic Wildfire in the Black Hills”

-Deadwood 1959-

Presented by

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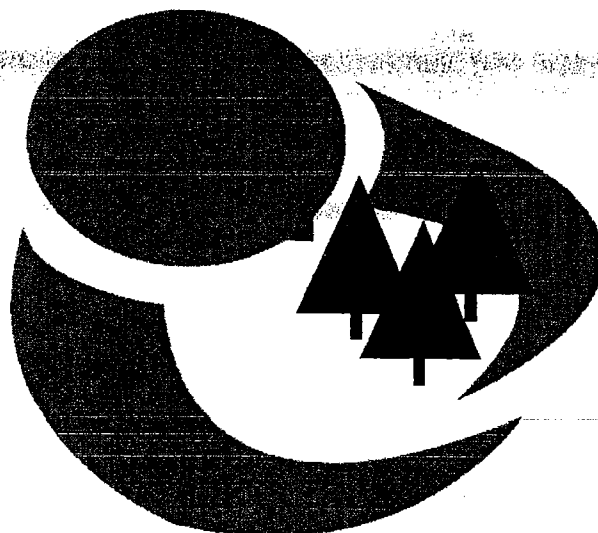
City of Lead

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-C.E.U. Handout-

Firewise Lead



a community effort

I. INTRODUCTION

On Tuesday, September 8, 1959 the Deadwood fire nearly destroyed the town of Deadwood in the Black Hills of South Dakota, home of Clamity Jane and Wild Bill Hickok. Over 4,501 acres were burned in a pattern that nearly surrounded the town. Structure damage in Deadwood totaled over \$1 million in 1959 dollars.

The town was evacuated ahead of the fire, and two other wildfires occurring simultaneously with the Deadwood fire making the situation even more critical from the standpoint of available firefighting resources.

The fire started during a period of extreme fire weather and twice threatened the town – once during the initial run, and again with the passage of a dry cold frontal system that caused winds to shift, driving the fire back towards the small community.

In the area to the northwest of Deadwood where the fire made its original run, there was nearly 100% kill of the 80-90 year old ponderosa pine timber. The fire missed scattered tracts of timber, over the remainder of the area. Emergency Flood Control money was expended for emergency treatment and watershed rehabilitation.

The Deadwood fire started in the backyard of the Hillcrest Manor, a rest home located in Gayville South Dakota on Highway 14a between Central City and Deadwood, location of the current KOA campground.

It was estimated that over 1,000 men were on the fire within the first hour and nearly 3,600 volunteer and regular firefighters were working on the fire by sundown on the day the fire started. Twenty-seven bulldozers, and 50+ pieces of various fire suppression apparatus were working the fire by 8:00 pm that evening. Four air tankers were used on the fire, however they did not see action until the next day Wednesday September 9th.

The Homestake Mining operations at Lead provided the largest number of organized crews. They were able to place nearly 100 men equipped with hand tools on the fire within minutes after the fire started. Production of the mine, mill and slime plant was shut down and the entire force sent to the fire area, providing a labor source of nearly 2,000 trained men with overhead (and, incidentally resulting in a substantial loss to the company due to shut down). Crews totaling nearly 400 were sent from Ellsworth Air Force Base near Rapid City and were on the fire the evening of the first day. Additional military reinforcements were provided during the days to follow. The Air Base also sent a hospital unit and three pieces of fire suppression equipment.

Compared to the 2002 Grizzly Gulch fire at it peak over 1,100 personnel from throughout the US were assigned to the fire

Rough ridges and valleys with frequent rock bluffs characterize the terrain-surrounding Deadwood. Elevation in the burned area ranged from 4,600 feet at Deadwood to 5,600 feet on the ridge top at the north end of the fire. Slopes vary from 10% to 65%, with an average of about 30%. Steep canyons and draws cut the area from all directions, making fire suppression difficult and dangerous.

Fire weather prior to the Deadwood fire had been critical since mid-August. On the day of the fire, the noon relative humidity was 11% as measured at the Nemo Ranger Station, 11 miles SE of Deadwood. Wind was SW at 20-25 miles per hour.

The air temperature 96° and the Drought Index was 95 as computed by the Region 2 Fire Danger Meter. The weather influencing the fire during the first two hours was critical enough to make direct action impossible. To make matters worse, a special fire weather forecast called for a classical cold front passage through the area between 2:30 and 4:00 pm, with the usual accompanying shift in wind direction and velocities increasing 30-40 mph. This produced an even more serious threat to the town of Deadwood with this shift in wind direction.

Nearly 4,000 people were evacuated from the town in less than 30 minutes. The evacuation period lasted for over 36-hours.

There were serious injuries, but no casualties on this fire, although several minor accidents did occur. Two dozer operators were burned when fire over ran them while they were working. A crew of men were temporarily trapped, but were led to safety by a helicopter. Power lines were down, and were threatening to the safety of firefighters until the power was cut off. Only one minor injury was reported during the 2002 Grizzly Gulch Fire. A minor twisting of the ankle occurred in fire camp.

There were reports of some extreme rates of fire spread during the early stages of the fire. We know the fire traveled from ignition point to U. S. Highway 85, on the NW edge of Deadwood in 1 hour and 20 minutes, a distance of 2-1/2 miles. In comparison the Grizzly Gulch fire of June 29th, 2002 also crossed a major highway, Highway 385 in under 2 hours.

There is no reliable rate of spread estimates when the fire changed directions with the cold front passage, but there appeared to be an overall decrease, even though the wind velocity increased. Patches of unburned materials were left and this caused control problems the following day.

There were actually two types of fires involved in the one Deadwood fire of 1959. The first fire was intense, running crown fire, burning under conditions of high temperatures, low humidity, and strong prevailing winds. This fire burned clear and was so intense that direct attack was impossible. With the passage of the cold front, the character of the fire changed. The wind shifted 90° from SW to NW and remained at about the same velocity (30 mph). Temperatures dropped. With this change, the fire moved in two heads toward the SE, flanking the town of Deadwood on the NE and SW. The fire was equally intense for a short while but began leaving islands of unburned fuel as the moisture content of surface fuels began to increase. Even the wind shift with the cold front passage was not what made this fire unique, it was the fact that twice it came so close to destroying the town of Deadwood; once when it passed to the NW of the town during the initial run and again when it flanked the town of the NE and SW.

With the passage of the cold front at about 3:30 pm, the fire changed directions, spotted across the valley in two locations, (NE & SW) and flanked Deadwood with two head fires going up timbered slopes. Control was achieved during the night after the fires had cooled down.

Fuels, Topography, and Weather: In 1959 The natural fuels around the Deadwood area are predominantly strands of ponderosa pine, 70-100 years old, Mostly un-thinned. Some Federal land had been thinned, but there was little slash fuel on the ground. Light, surface fuels, such as grass and needles, are usually abundant under the Black Hills pine stands. This flash fuel provided the "wick" that extended the fire from source to tree crowns in a matter of minutes. A very similar situation remains today.

Control Time: The Deadwood fire started at 1:00 pm, on September 8, 1959, roughly the final perimeter was reached about 7 hours later. There was holding action throughout the following day, September 9, but only burnout of hot spots occurred, and there was no change in perimeter, the fire was declared out on September 23, 1959.

The Deadwood Fire of 1959 remains to this day the most destructive fire to private property, homes and infrastructure **ever recorded** in South Dakota. Over 60 plus structures destroyed. Barber Transportation Whare house, Power and Telephone lines, Motels, Post and Pole Plant, Wood Treatment Plant and Family homes, Farms, Ranches, Cattle and livestock. Infrastructure was damaged beyond repair or destroyed. There was substantial permanent job lost and economic downturn as people and families left the area for good as a result of the 1959 Deadwood Fire, this phenomenon is repeated throughout the history of stand replacement fires in Lawrence County South Dakota.

The Deadwood Fire of 1959 and 2002 Grizzly Gulch fire which destroyed 7 homes, 20+ structures and 10,801 acres further demonstrates the continuing the cyclic nature of stand replacement fires in the Northern Black Hills.

Size and Damage: A total of 4,501 acres were burned during the 1959 Deadwood fire.

Landownership of the burned area is as follows:

<u>Ownership</u>	<u>Acres Burned</u>
National Forest Land	975
Private lands inside NF Boundary	896
Private lands outside NF boundary	1,664
Other public lands (BLM)	996
Total	4,501

Deadwood and the adjacent community suffered extensive losses and damage from the fire. The town of Deadwood was not destroyed, but fire did burn within the city limits. Total damages were approximately \$1,558,000.00 in 1959 dollars. Of this, damage to structural improvements totaled nearly \$1 million in 1959 dollars and includes among other items:

Two Forest products Plants	\$ 572,000
Other Business Establishments	59,000
Public Utilities (lines and poles)	51,000
Residences	120,000
Other Buildings and Improvements	87,000
Total	\$ 889,000 (1959 dollars)