

Examination of the Home Destruction in Los Alamos Associated with the Cerro Grande Fire July 10, 2000

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I arrived at Los Alamos on May 14, 2000 to conduct an examination of the home destruction associated with the Cerro Grande Fire. My examination occurred between the afternoon of 5/14 and late afternoon on 5/16. I had contact with the southern command post incident management team, the Los Alamos Fire Department, and the Santa Fe National Forest.

The homes were destroyed as the main body of the Cerro Grande Fire burned past Los Alamos to the north-northeast and then toward the northeast between about 1700 on 5/10 to the early morning hours of 5/11. About 200 single and multi-family structures were totally destroyed or irreparably damaged. Although fire suppression actions saved homes, the high ignitability of most of the residential area allowed numerous simultaneous house fires that quickly overwhelmed the suppression forces.

1) Although the Cerro Grande Fire burned as an intense, continuously spreading crown fire (fire spread through the tree canopy) in certain areas, within several hundred yards or more of the Los Alamos residential area it burned as a surface fire—an under burn. The pictures show tree canopies that were variably scorched but not consumed next to totally destroyed homes.



Photo 1—The crown fire burned on the ridge (mid-picture) west of Los Alamos.



Photo 2—The fire burned only in surface fuels as it came from the wild land in the background toward the residential area. The wild land fire commonly burned through continuous fuels to encounter and burn through heavier residential fuels such as woodpiles (bottom right), flammable shrubs, heavy pine needle beds, and homes.



Photo 3—Within the residential area, separated by several streets from the wild land, the fire generally burned as an under-burn with scorched but unconsumed tree canopies. The surface under the trees in the foreground did not burn, but the house to the left was totally destroyed.

2) Commonly homes were totally destroyed with the tree canopies leading up to and adjacent to the structures remaining unconsumed. The canopy consumption that occurred adjacent to and downwind from homes occurred from burning homes. With the exception of two local and limited areas where crown fire occurred adjacent to the residential area, a surface fire spread into Los Alamos. The unconsumed vegetation surrounding destroyed homes indicates that these homes were exposed to a low intensity surface fire, not a high intensity crown fire. Many of the homes destroyed, particularly

the 4-plexes on the northwest side (*Photo 6*), occurred from structure-to-structure spread (communication with Steve Coburn, LAFD). In general, the intense wildfire burned past the residential area to the west and north of Los Alamos. Scattered islands of destroyed homes at the community margin suggest low firebrand exposures and low spotting potential during the late night and morning hours during which much of the residential area burned.



Photo 4—The unconsumed, moderately scorched tree canopy along with the remaining wood rail fence indicate that this home was exposed to a low intensity surface fire. The high intensity wildfire burned on the hills in the background.



Photo 5—This totally destroyed home was within the residential area. A road separated it from other burning vegetation and homes. The unconsumed vegetation with little scorch indicates that the fire intensity surrounding the home was low. This suggests that firebrands (burning embers from other fires) ignited the home directly and/or in adjacent flammable materials that spread to the home.



Photo 6—Significant structure-to-structure fire spread occurred from flames and firebrands in an area of multifamily residences. The unconsumed vegetation surrounding the corridor of destruction indicates that the high fire intensities were due to the burning structures.

3) My examination suggests that the abundance and ubiquity of pine needles, dead leaves, cured vegetation, flammable shrubs, wood piles, etc. adjacent to, touching and or covering the homes principally contributed to the residential losses. Discussion with the Los Alamos FD indicated that few wood roofs existed and thus were not a significant factor. In many areas of home destruction a continuous ponderosa pine (*Pinus ponderosa*) canopy existed within the residential area. This produced a continuous pine needle fuel bed to the homes as well as pine needles deposited on the homes (roofs and gutters). An examination of surviving homes in areas of home destruction indicated that a low intensity surface fire in pine needles could burn to a home and ignite its wood siding. In several cases, a scratch line that removed pine needles from the base of a wood wall kept the house from igniting. Firebrand ignitions likely started fires in these pine needle fuels in areas within the community that were separated by streets.

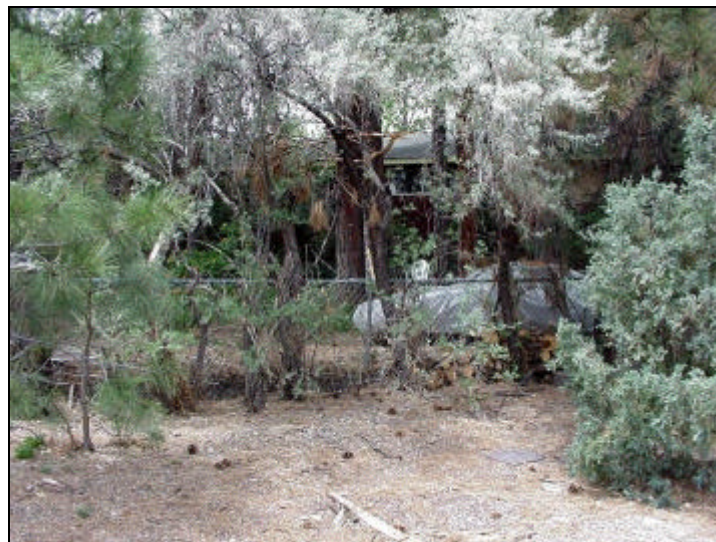


Photo 7—The tree canopy, shrubs, pine needle bed, and woodpile adjacent to and touching this Los Alamos home represents a common situation.



Photo 8—The surrounding ponderosa pine canopy deposited pine needles on this roof. The roof surface fire burned the needles without igniting the roof. The roof covering types were “built-up” gravel and composition shingle. The house did not have gutters to accumulate needles, potentially ignite and thereby ignite the eave edge. Although the neighboring home was totally destroyed (in the background) the tree canopies did not burn. The roof pine needle fire likely ignited from firebrands generated by the burning home next door.

- 4) That portion of the Cerro Grande Fire that burned into the community generally spread as a relatively low intensity surface fire, not as a high intensity crown fire. Homes ignited and burned from wildfire flames and firebrands that did not burn tree canopies and other vegetation in the same area.

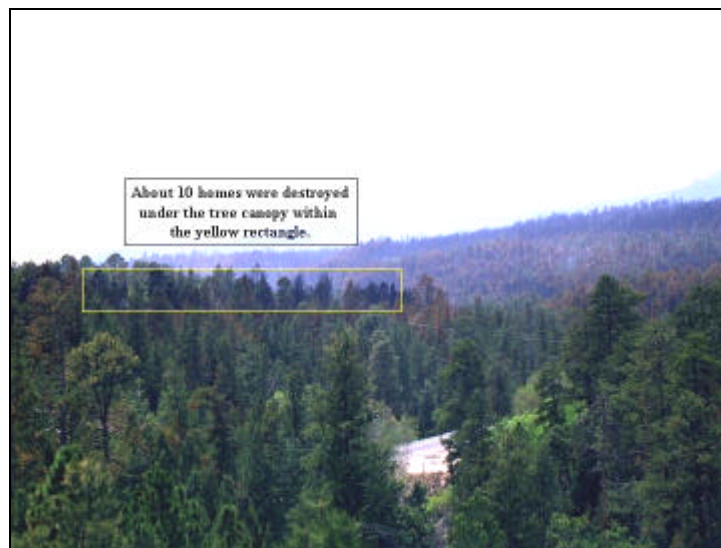


Photo 9— This is the Pueblo Canyon area looking southwest toward Ridgeway Road (within the yellow rectangle) with North Road visible towards the bottom of the photo. The Cerro Grande Fire burned as a crown fire on the slope in the background but as a surface fire in the foreground. Close inspection reveals torched trees within the yellow rectangle.



Photo 10—This is a portion of the area within the yellow rectangle shown in the previous photo. The trees burned from the burning homes. The homes ignited from the low intensity surface fire and adjacent burning homes.