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Lessons From the October 2003 Wildfires in Southern California

The southern California fires of October 2003 burned 742,000 ac (300,000 ha), destroying over 3,000 homes and killing 26 people. It was the costliest disaster to befall California, exceeding previous fires, earthquakes and other natural disasters. In the October/November 2004 issue of the *Journal of Forestry,* USGS scientist Dr. Jon Keeley and colleagues C. J. Fotheringham (University of California, Los Angeles) and Dr. Max Moritz (UC Berkeley) discuss the factors leading up to this event, and the appropriate response necessary to reduce the chances of a repeat of these catastrophic impacts.

Management Implications:

- These massive fires were not unprecedented, and future fires of this magnitude are to be expected in these shrubland landscapes.
- Fuel reductions would have done little to stop the spread of these fires, although greater strategic use of fuel manipulation at the wildland/urban interface may have reduced loss of lives and property.
- Future development in the region needs to include planning for these natural fire events much the same way we currently incorporate engineering solutions to earthquakes and other natural catastrophes.

The fires burned through diverse plant communities with very different responses to fire and fuel manipulation. Forests in the region have had their natural fire cycle of low-intensity surface fires interrupted by fire suppression policy, resulting in near fire exclusion and hazardous conditions from the accumulation of dead surface fuels and living ladder fuels. In these forests prior fuel reduction management may have decreased the severity of burning. However, these forests comprised only about 5 % of the total acreage burned.

Chaparral and related shrublands dominated most of the landscape burned during the October 2003 fires. The natural fuel structure in these ecosystems leads to high-intensity crown fires, and fuel load plays a minor role in controlling the spread of many of these fires. Despite heroic fire fighting efforts, southern California shrublands are an anomaly in that fire suppression policy has not resulted in fire exclusion. As a result, there is no evidence that fire hazard is controlled by fuel loading in these systems. The primary reason is because this region has the worst fire climate in the country. The October 2003 wildfires were fanned by Santa Ana winds that often reached speeds of 50–60 mph. Under these conditions, fire fighters were forced into defensive actions and could do very little to stop these firestorms.

Currently, fire management is based on a philosophy that fuel management practices can control the ultimate size of these massive fire events by creating fuel mosaics that include patches of young fuel, which theoretically are expected to act as barriers to fire spread. Under extreme weather conditions there is overwhelming evidence that young fuels, or even fuel breaks, will not act as a barrier to fire spread. Examination of stand age maps shows that much of the landscape that burned in these recent fires was a mosaic with substantial patches of young fuels. The primary reason young fuels cannot act as a barrier to fire spread under these severe weather conditions is that if the high winds do not push the fire through the young age classes, they will spread the fire around them, or jump over them from fire brands that can spread up to a mile or more.

This conclusion is not meant to suggest that fuel reduction should not be an important part of the fire management arsenal. While fuel reduction in chaparral shrublands will not stop fires under severe weather conditions, it may lead to reduced fire intensity and increase the defensible space for fire fighters. These Santa Ana-driven fires are fast moving, and pre-fire fuel manipulation directed at creating defensible space needs to be applied strategically. Although further economic study is needed, it is expected that the most cost-effective use of fuel reduction would be at the wildland-urban interface.

In the future, it will be necessary to recognize that there are significant negative resource impacts from fuel reduction projects and to reach the appropriate balance between fire hazard reduction and resource benefit.

Keeley, J. E., C. J. Fotheringham, and M. A. Moritz. 2004. Lessons from the October 2003 wildfires in southern California. Journal of Forestry 102(7):26–31.