CALIFORNIA FIRE SCIENCE CONSORTIUM

JOINT FIRE SCIENCE PROGRAM

Research Brief for Resource Managers

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Lessons learned from the 2007 Southern California wildfires

Keeley, Jon E., et al. "The 2007 Southern California Wildfires: Lessons in Complexity." Journal of Forestry 107.6 (2009): 287-96.
http://www.californiachaparral.org/images/2007_Fires_lessons_in_complexity_Keeley_2009.pdf.

Southern California's intense fire regime is driven by extreme conditions from Santa Ana windstorms, severe drought, and a high frequency of human ignitions. Rapid development and dense urbanization of the wildland-urban interface (WUI) complicates fire prevention efforts.

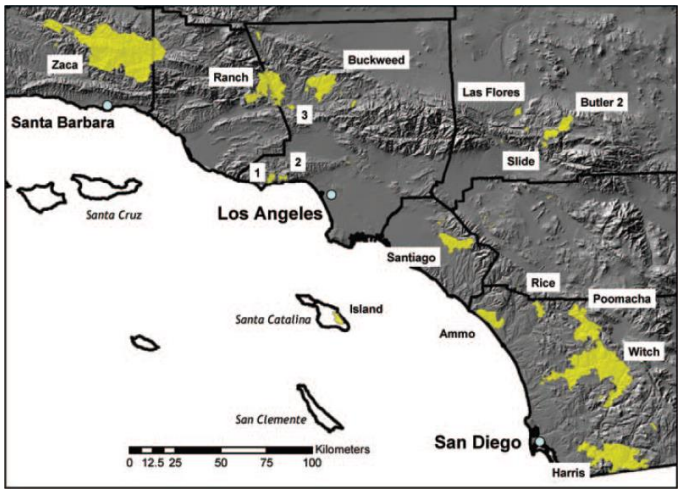

Figure 1 extracted from Keeley et al., 2009. Southern California and locations of study fires. Fires greater than 100 ha in size are identified. Numbers refer to (1) Corral Fire, (2) Malibu Canyon Fire, and (3) Magic Fire.

Observations from the 2007 wildfire season in southern California led to several important implications for managing fire risk under these extreme environmental and social conditions.

Key management Implications

- Treated or recently burned chaparral fuels cannot be expected to stop wildfires when driven by Santa Ana winds.
- Long term drought increases dead standing fuel loads in chaparral and montane environments, and can result in uncontrollable wildfire.
- Forest thinning is not enough to prevent home loss when wildfires spread to dense urban fuels through spot ignition.
- Since the vast majority of Southern California's wildfires are caused by human ignitions, management must focus on preventing ignition during times of high fire danger.

Lesson 1: Under unfavorable conditions, fuel treatments or the recent occurrence of fire

cannot be expected to impede the spread of wildfires in shrublands. Long-term drought produced large amounts of standing dead fuels in southern California shrublands, making them highly vulnerable to spot ignition when combined with Santa Ana winds. Spot ignitions far ahead of the flame front rapidly spread wildfires and lead to extensive structure losses in 2007. The goal of fuel treatments should be to reduce flame lengths or create defensible space around structures or firefighting positions.

Lesson 2: Remote, chaparral-dominated landscapes are vulnerable to massive, long-duration wildfires. In southern California, fuels accumulated in inaccessible areas because

topography and lack of roads made treatment difficult or impossible, and limited the frequency of human ignitions. When human ignition did occur, rugged terrain made direct firefighting too risky, allowing wildfires to burn out of control in 2007. Preventing human ignitions by placing restrictions on the use of machinery during times of high fire danger is essential for reducing the potential for massive wildfires in remote areas.

Lesson 3: Forest thinning is not enough to prevent structure losses at the WUI when dense, flammable urban fuels are present.
In 2007, urban fuels became the vector for southern California's wildfires when high winds caused spot ignitions in spite of extensive forest thinning. High home density and flammable construction materials such as shake roofs and wooden decks allowed fires to spread rapidly, overwhelming firefighting efforts.
Maintaining careful home spacing and landscaping standards, and using fire-resistant construction materials, is crucial for preventing home loss at the WUI.

Summary
Southern California's potential for drought, windstorms, and ever-increasing residential encroachment require land managers to enact policies that will reduce the number and frequency of human ignitions. Specific policies should include placement of power lines underground in corridors of known Santa Ana winds, more conspicuous arson patrols, and maintenance of roadside ignition barriers or buffer zones. Finally, when strategically located, fuel treatments can be effective at preventing property damage by creating defensible space. However, fuel treatments alone are not enough to prevent wildfires. Efforts must be made to maintain safe standards for home spacing, landscaping, and building materials.