

Publication Brief for Resource Managers

Release:

October 2011

Contacts:

Jon E. Keeley
Alex Syphard

Email:

jon_keeley@usgs.gov
asyphard@consbio.org

Phone:

559-565-3170
619-328-1001

USGS Western Ecological Research Center | Sequoia and Kings Canyon Field Station | 47050 Generals Hwy #4, Three Rivers, CA 93271

Fuel Break Effectiveness in Southern California Depends on Firefighter Access

In California, the predominant approach to mitigating wildfire risk is the construction of fuel breaks, but there has been little systematic research on their role in controlling large fires.

Two studies led by USGS and the Conservation Biology Institute have examined the factors affecting fuel break effectiveness in national forests. Both studies concluded that in general, fuel breaks played an important role in controlling large fires, but only when they facilitated fire management activities, primarily by providing access for firefighters.

The first study, published in *International Journal of Wildland Fire*, constructed a spatial database of fuel breaks in the Los Padres National Forest to map where fires and fuel breaks most commonly intersect. Researchers evaluated whether fires stopped or crossed over fuel breaks over a 28-year period, and compared the outcomes with site characteristics, weather and firefighting activities taken place.

In Los Padres, fires stopped at fuel breaks 46% of the time, although many fuel breaks never intersected fires. Among the key factors leading to fire stoppage was firefighter access to the fuel break, illustrating the importance of strategically locating fuel breaks.

The second study, published in *Forest Ecology and Management*, examined fuel breaks and fires at Los Padres, Angeles, San Bernardino and Cleveland National Forests over a 30-year period. While the relative importance of factors affecting fuel break effectiveness varied among forests, the fuel breaks' primary role was consistently to facilitate fire management. Again, fuel breaks helped control large fires primarily when they provided access for firefighting activities.

In both studies, a large number of fuel breaks never

Management Implications

- A substantial number of fuel breaks are never intersected by fires.
- Factors affecting fuel break effectiveness varied among the four southern California forests, but they primarily served to facilitate fire management activities.
- Firefighter access — to fuel breaks for backfires and other control measures — was the most important determinant of their effectiveness.
- Among the forests studied, only 22% to 47% of fires stopped at fuel breaks, even when firefighters could access them.

THIS BRIEF REFERS TO:

Syphard, A.D., J.E. Keeley, T.J. Brennan. 2011. Comparing the Role of Fuel Breaks Across Southern California National Forests. *Forest Ecology and Management* 261(2011): 2038-2048. doi: 10.1016/j.foreco.2011.02.030

Syphard, A.D., J.E. Keeley, T.J. Brennan. 2011. Factors Affecting Fuel Break Effectiveness in the Control of Large Fires on the Los Padres National Forest, California. *International Journal of Wildland Fire* 20: 764-775. doi: 10.1071/WF10065

<http://www.werc.usgs.gov/seki>
<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4550>

intersected fires, showing that fuel breaks are often located in areas where fires are not likely to occur. Models and maps showing where fuel breaks and fires are most likely to intersect, developed for all four forests, could be incorporated into the planning process for better strategic placement of new construction.

Both studies suggest that fuel breaks can play a role in fire control, but mainly when firefighters have access to them. Managers may need to account for access points to strategically and efficiently locate fire breaks.