

Western Ecological Research Center

Publication Brief for Resource Managers

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Ecological Effects of Large Fires on U.S. Landscapes: Benefit or Catastrophe?

Many people assume that large fires are an ecological catastrophe because they typically burn vast areas with high intensities and severities. However, little is known of the historical frequency of large fires or their impact, and debate surrounds both the causes and the ecological consequences of these fires. In the December issue of the *International Journal of Wildland Fire*, USGS scientist Jon Keeley and colleagues from the U.S. Forest Service and academia review the current knowledge of the effect of large fires in U.S. ecosystems. Large fires are increasingly important in many North American biomes, including Southern California, the Pacific Northwest, Northern Rockies, Southwestern United States, Midwest, and Great Basin. These include ponderosa pine-Douglas-fir, sagebrush-grasslands, pinyon-juniper, chaparral, mixed conifer, and spruce-fir ecosystems.

Although large fires have been viewed as anomalous events that are unique to contemporary landscapes, this is clearly not true in a great many ecosystems. There appears to be no indication that the frequency and severity of large fires have changed from historical fire regimes on landscapes as diverse as Rocky Mountain conifer forests and southern California chaparral.

Conventional wisdom often holds that large fires tend to be more severe and therefore undesirable. In many forested systems it does not appear that fire size determines fire severity, and in shrubland ecosystems there is no evidence that high fire severity has negative ecosystem impacts. Indeed, in shrubland ecosystems decreased fire intensity accompanies unwanted type conversion to alien grasses.

Management Implications:

- Large fires were common on historical landscapes of the western United States and will continue to be on contemporary landscapes.
- Large fires were an important disturbance, and many plant and animal species have adapted to survive and thrive after these events.
- There is limited data to critically evaluate any changes in historical large fire effects because most large fires removed evidence of past severity patterns.
- Fire size does not necessarily translate into higher fire severity, and higher fire severity is not always damaging to ecosystems.

Keane, R.E., J.K. Agee, P. Fulé, J.E. Keeley, C. Key, S.G. Kitchen, R. Miller, and L.A. Schulte. 2008. Ecological effects of large fires on US landscapes: benefit or catastrophe? *International Journal of Wildland Fire* 17:696-712.

[Complete article can be downloaded from web site listed at top of page.]