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Op-Ed: Fire in the West- It's no simple story

guest editorial for *High Country News*

As scientists who have long grappled with the complexities of fire history in the West, we take issue with Ray Ring's overreaching storyline that the recent spate of stand-replacing forest fires reflects wholly natural processes operating across all Western landscapes ("A Losing Battle," HCN, May 26). Ring further asserts that the main driver of recent crown fires must be climatic change, and not the extraordinary fuel accumulations of the 20th century. If we want to cope with huge wildfires over the long term, Ring concludes, we should focus less on thinning our forests and more on cutting greenhouse gas emissions to curtail global warming.

We appreciate that Ring's simple storyline was meant to be provocative. We insist, however, that the circumstances driving Western wildfires are actually quite varied and complex, involving interactions between climate *and* fuels.

Pre-20th century evidence of fire activity varies across different landforms, elevations, latitudes and climates, even within the same forest type. Large stand-replacing fires are certainly natural in some, but not all, Western forests — especially in relatively cool and wet types, ranging from coastal Douglas fir to interior lodgepole pine and subalpine Engelmann spruce. In contrast, many warmer, drier and often lower-elevation forests were once characterized by surface fires.

In ponderosa pine, for example, frequent, low-intensity surface fires routinely killed many young trees and spared the older fire-resistant ones, favoring open grassy understories and reducing the probability of stand-replacing fires and extreme post-fire erosion. Within ponderosa pine, there is some evidence for stand-replacing fires of unknown extent in the Central Rockies. There is no known precedent, however, for the size and severity of stand-replacing fires recently experienced in the Southwest and probably in ponderosa pine West-wide.

Is climate to blame for the recent spate of crown fires in the Southwest's ponderosas? Yes and no. Climate regulates fuel moisture, thereby driving fire behavior. Climate also varies across space and through time. Some places are more fire-prone than others. Regional and topographic gradients of moisture, temperature, lightning and wind (interacting with fuels) determine natural patterns of fire activity in Western forests. Substantial year-to-year changes in precipitation drive how much area burns at a regional scale.

There are also multi-decadal fluctuations in precipitation, which track the slow behavior of the oceans, and can produce persistent droughts. The middle of the last century spanned two continental-scale megadroughts, in the 1930s and 1950s. Yet neither drought produced the kind of stand-replacing fires we saw in Arizona's Rodeo-Chediski, New Mexico's Cerro Grande or Colorado's Hayman Fire.

Something other than climate must be at work here.

Many Western forests have undergone extraordinary changes during the 20th century. The evidence is unmistakable to most scientists, from repeat photography, fire-scar analyses, forest stand reconstructions and pollen and charcoal studies. These changes are most profound in the dry, long-needle pine forests of the West, especially ponderosa pine. Among the changes are manyfold increases in the density of trees and landscape-scale continuity of heavy fuels. Today, in place of an open understory, we find thick brush, downed timber and many young trees; fires that start on the ground can spread quickly, then climb through the branches of small trees, which create a "ladder" to the larger trees in the forest canopy.

This wholesale transformation happened with reduction of grassy fuels by livestock grazing, which largely eliminated low-intensity surface fires, and with more proactive fire suppression after World War II. Climate also fostered continued fuel accumulation in two unusually wet decades from 1976 to 1995. During those decades, wildfires cleared relatively little fuel from the forests, while implementation of prescribed burning and fuels treatment fell farther behind.

Given the unprecedented magnitude and continuity of current fuel loads in dry forests, it would be truly astonishing if modern crown fires were not abnormal in severity and scale. Simply put, the more extreme the fuels, the less extreme the climate needs to be to drive extreme (crown) fire behavior. Now, even normal dry-season weather carries risk of crown fire in the fuel-packed semiarid forests of the West.

What does the future hold? In 1995 and 1998, respectively, the North Atlantic turned warm and the Pacific went cold; the same configuration as the 1950s and one of the recipes for North American megadrought. The water year (October-September) of 2002 was among the driest in the instrumental record of many Western states. Forecasters now predict La Niña conditions and continued drought in 2004. This prolonged decrease in precipitation across much of the West is well within the range of natural climate variability and may have little to do with global climate change. The buildup in greenhouse gases may explain longer and hotter growing seasons, however, exacerbating the severity of drought and fire.

Many of us who work across fields in climate and ecology think that we are now facing another megadrought, a natural trigger to stand-replacing fires, but this time with unnaturally-large fuel loads in forests now poised for severe, landscape-scale burns. In harm's way are the headwaters of the Western U.S., multiple communities, and much of our biodiversity and recreational lands. Detrimental effects of anomalous stand-replacing fires include flooding, loss of soil and site productivity, disruptions to municipal watersheds, conversion of extensive forest areas to shrublands, noxious weed invasions, and loss of habitat for sensitive species.

What should we do? Where crown fire is natural, mechanical thinning may not be warranted, at least ecologically. However, many Western forests urgently need ecological restoration, including fuel-reduction treatments. Still, fuels treatment (and cutting greenhouse gas emissions), while certainly worthwhile, will probably not beat Nature to the punch. It took a hundred years to build up these unsustainable powder kegs, but it may take megadrought, via forest dieback and fire, only one or two decades to set them off.

If we do decide to go ahead with forest thinning and fuels reduction programs, we should prioritize those forests that could pose a threat to life and property — and those forests that are critical for watersheds or

ecosystems. Given the worrisome climate and fire outlook, wise investments should also be made in the science and management of post-fire rehabilitation and ecological restoration.

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