

Western Ecological Research Center

Publication Brief for Resource Managers

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Role of Burning Season on Understory Vegetation in a Mixed Conifer Forest

Fire historically played a dominant role in shaping plant communities in the western United States. In many forests, prescribed fire is now being used in place of wildfire to reduce hazardous fuel accumulation, as well as create forest structures more resilient to disturbance. Although the majority of fires in the western United States historically occurred during the late summer or early fall, fire managers are often prevented from using prescription burning at this time due to air quality restrictions. One way of increasing the burning window is to burn earlier in the year. However, such fires are considered to be largely outside the historical fire regime, and ecosystem impacts of such early season fires are not well understood.

USGS researchers Dr. Eric Knapp (now with the USFS Pacific Southwest Research Station), Dr. Dylan Schwilk, Jeffrey Kane, and Dr. Jon Keeley have added to our understanding of early season burning by comparing early summer burning with fall burning in mixed conifer forests in Sequoia National Park. This replicated experiment was part of a national network of sites funded by the Joint Fire Science Program for the Fire and Fire Surrogate Study, and was published in the *Canadian Journal of Forest Research*.

Fall burning occurs at a time when fuels are dry and plants dormant or nearly so, whereas early season prescribed burns are often ignited when fuels are still moist and plants are actively growing. Thus, there is good reason to be concerned about potential negative ecosystem impacts from early season burning, particularly on post-fire vegetation recovery of the understory. However, this study found that early season burning had no significant negative effects on understory cover or species diversity. In fact, early season burns may

Management Implications:

- Increased opportunities for prescription burning may occur by extending the normal burning season to earlier in the year.
- Understory response to burning in different seasons was complex, but no long-term impacts on understory composition from early season burning were evident from this study.
- On landscapes with excessive fuel accumulation, early season burning may act to reduce fire intensity and benefit understory recovery.

have moderated the effect of fire on many understory plant species by consuming less fuel and lessening the amount of soil heating, a particularly important factor on these sites that have experienced over a century of surface fuel accumulation.

In general, their results suggest that when burned under high fuel-loading conditions, many plant species respond more strongly to differences in fire intensity and severity than to timing of the burn relative to stage of plant growth.

Knapp, E. E., D. W. Schwilk, J. M. Kane, and J. E. Keeley. 2007. Role of burning season on initial understory vegetation response to prescribed fire in a mixed conifer forest. Canadian Journal of Forest Research 37:11–22.