Spatial and temporal variation in conifer establishment 10 and 20 years after forest fire.

Jeffrey P.A. Shatford, David E. Hibbs.

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Fire plays a major role in shaping plant community composition in the conifer forests of N. California and SW Oregon. Following canopy removal, intense competition from hardwoods and dense shrub cover is believed to severely limit conifer regeneration. However, little information is available to assess how conifers repopulate sites after these canopy replacing events. The region includes a steep gradient of productivity from cool mesic coastal forests across rugged mountains to dry inland valleys. We identified 25 forest fires across this gradient that; 1) had occurred 10 to 20 years ago and 2) included areas of high severity burn that 3) had not been subject to management after the fire. Vegetation cover and tree density were measured on 100 plots. We aged a subset of dominant conifer seedlings to determine the timing of seedling establishment after fire. We hypothesized that microsite conditions, distance from seed source and aspect, along with local climate (i.e. elevation and distance from Pacific coastal influence) would determine the rate and abundance of forest regeneration after fire. Inland valleys were dominated by ponderosa pine and oak woodlands. Douglas-fir associations included ponderosa at the dry end and tan-oak on more mesic sites. At higher elevations, we encountered white fir and its associates. Despite an abundance of hardwood and shrub cover 10 to 20 years after forest fire, conifer abundance was typically high (median seedling density 917 seedlings/ha, range zero to 22,000 seedlings/ ha). Plots with little to no conifer establishment occurred within interior valleys, especially on south aspects and at low elevation. High elevation plots tended to have an over abundance of conifer seedlings. Regeneration is a protracted process with successful regeneration occurring up to 20 years after a fire. The density of seedlings observed suggests that sufficient conifer establishment is occurring to ensure their return on all but the driest sites.