

Assessment of Jeffrey Pine Beetle-Caused Mortality from 1991-1996, Spooner Junction, Lake Tahoe Basin

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A Jeffrey pine beetle (*Dendroctonus jeffreyi* Hopkins) (JPB) epidemic caused Jeffrey pine (*Pinus jeffreyi* Balf.) mortality throughout the Lake Tahoe Basin from 1991-1996 following multiple years of below average precipitation. Census tree data, including geospatial location, were obtained from a continuous, 60-acre study area near Spooner Junction that was established to assess JPB activity without management intervention. This epidemic is considered to be at the high end of potential JPB outbreak scenarios based on prior outbreaks documented.

We quantified conditions within the study area that supported this outbreak, mortality levels, effect of JPBs on forest attributes, and conditions that were resilient to JPB-caused mortality. The study area was located on south-facing slopes that ranged from 5-20%. Forest conditions averaged 15" quadratic mean diameter, 302 stand density index (SDI), 37% canopy cover, and 95% Jeffrey pine host species composition. JPBs caused mortality in 44% of all available Jeffrey pines within the study area at a rate of 74 trees/acre. The JPB-caused mortality (trees/acre) response had a strong positive, linear relationship with stand density index in a best-fit, mixed regression model that adjusted for significant spatial autocorrelation. Tree mortality occurred in proportion to available host in stems < 30" diameter at 4.5 feet in height (DBH); however, mortality was disproportionately less in stems \geq 30" DBH. Portions of the study area with < 210 SDI or 125 square feet of basal area per acre were resilient to extensive tree mortality even after exposure to high levels of JPB population pressure.