Prescribed fire is used in Missouri to achieve various silvicultural goals, but the use of burning in upland Ozark forests raises many questions that research has yet to answer. The purpose of this study is to examine the effects of prescribed burning on fire scars, overstory tree vigor, and ground flora vegetation. Data were collected from 22 burn units in five counties in the Missouri Ozark. Fire scar data were collected for Quercus alba L., Quercus coccinea Muench., Quercus shumardii Buckl., Quercus stellata Waengh., Quercus velutina Lam., Carya spp. Nutt., and Pinus echinata Mill. Pinus echinata was the most resistant to fire scarring, and Quercus coccinea and Quercus shumardii were the least resistant. Regression analysis reveals that stem bark char height, a proxy for fire intensity, is the most effective postfire predictor of percentage of trees scarred and extent of scarring. Landscape features such as aspect, fetch, and slope steepness were also important predictors of extent of scarring for some species. Tree vigor in Quercus coccinea was negatively correlated with fire injury, but there was no difference in tree vigor in burned and unburned stands. Tree vigor of Quercus velutina was higher in burned stands, although the difference may not be biologically significant. Grass cover was highest in burned stands, and tree seedling cover was highest in stands burned one year before sampling. Models developed from this study can aid managers in assessment of potential injury to trees based on landscape features and fire intensity.