Tree Shearing to Control Douglas-Fir Encroachment on Foothill Grassland

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Encroachment of native conifer species into grassland and shrub steppe disrupts natural ecosystem processes and diminishes resource values including wildlife habitat, water yield, and livestock forage production. Prescribed burning can be used to suppress conifer encroachment, but increasing concerns about financial liability and air quality limit the future use of this tool. New, cost-effective methods are needed for controlling conifer encroachment into rangelands. One alternative is to cut trees with a tree shear mounted on a skid steer loader. Tree shearing is a safe, fast method, however, tree-shearing treatment costs increase markedly with increased tree densities. Forage response to tree shearing needs quantified to determine which tree densities can be treated economically. Our study in west-central Montana evaluated 3 densities of Douglas-fir encroachment (low, moderate, high), plus un-invaded sites (control). Tree shearing treatments were applied in Fall 2006, and plant community response was sampled in July 2007 and 2008. Results indicate that low tree densities did not affect herbaceous forage production, but moderate and heavy tree densities reduced herbaceous forage production 54% and 92%, respectively. Two years post-tree removal, herbaceous forage production in moderate- and high-density sites no longer differed from un-invaded sites. However, canopy cover of decreaser species was greater in un-invaded and low-density sites (28%) than in moderate- or high-density sites (18% or 7%, respectively). Results suggest that tree shearing should be applied before encroaching Douglas-fir trees achieve high densities.

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