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Species diversity in understory vegetation of transitional forested rangelands in the Blue Mountains of Eastern Oregon

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Abstract

The objective of this study was to quantify understory species diversity response to overstory manipulation of Blue Mountain eco-region forest. Forty nine ecological land units, including differing successional stages (sapling, pole, small saw, and saw log) and canopy cover (light and medium) in dry Grand Fir (*Abies grandis*), wet Grand Fir, dry Douglas Fir (*Pseudotsuga menziesii*), wet Douglas Fir, Ponderosa Pine (*Pinus ponderosa*) habitat types, and non-forest communities (Wet Meadow, Riparian Grass, Grassland, and Scabland) were sampled for production by species with 3 to 15 replicates per ecological land unit, over 3 consecutive years. The Shannon diversity index (H) was used to characterize species diversity in a community. Species diversity (H) and evenness (E_H) for forest communities ranged from 1.61 to 1.96 and from 0.61 to 0.68,

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respectively. Wet Grand Fir habitat type had higher diversity ($P < 0.01$) than the other habitat types. Non-forest communities were similar ($P > 0.01$) in species diversity and evenness, ranging from 1.46 to 1.62 and from 0.54 to 0.67, respectively. Although dry and wet environments did not influence ($P > 0.01$) Douglas Fir understory diversity, wet Grand Fir habitat type tended to be more diverse. Early successional stage in forest habitats had higher ($P < 0.01$) species diversity and evenness ($H = 1.93$ and $E_H = 0.68$) compared to later successional stages ($H = 1.69$ and $E_H = 0.63$). Light and medium densities of overstory canopy cover did not influence ($P > 0.01$) diversity of understory vegetation. Diversity in recently logged habitats was not different ($P > 0.01$) from other successional stages. In summary, diversity of forest communities was influenced by overstory manipulation with greater diversity in early successional stages.

Key Words: vegetation, diversity, canopy manipulation