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Understory production 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 vegetation 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 with 3 to 15 replicates per ecological land unit for production by species over 3 consecutive years. Production ranged from 799.9 to 1050.6 kg/ha for forest communities and from 686.5 to 3534.5 kg/ha for non-forest communities. Within forest communities, wet Douglas Fir habitats had lower production

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($P < 0.01$) than the other habitat types. Non-forest communities varied in production ($P < 0.01$) with scabland being lowest and wet meadow - highest. Higher productions ($P < 0.01$) were obtained in recently logged dry Grand Fir and dry Douglas Fir habitats compared to the other successional stages. Otherwise, successional stages were similar in production ($P > 0.01$). Light and medium densities of overstory canopy cover did not influence ($P > 0.01$) understory production, except light covered wet Grand Fir having greater production ($P < 0.01$) than medium covered wet and dry Grand Fir habitats. Growth form production did not differ ($P > 0.01$) between successional stages, although later successional stages of wet Douglas Fir habitats declined in grasses and forbs with an increasing shrub component. In summary, overstory manipulation changes understory vegetation by increasing grasses and forbs in dry and wet environments of Grand Fir and in dry Douglas Fir communities, but did not influence other habitat types.

Key Words: forested rangelands, forage production, canopy manipulation