

Lichen Habitat May Be Enhanced by Thinning Treatments

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Presentation Abstract

Epiphytic lichen communities have become a focus for ecologists concerned with forest health because lichens are particularly responsive to forest management and air quality. Furthermore, they can contribute substantially to the diversity and nitrogen fixation of a stand, and play a valuable role in the food web of many forest-dwelling organisms. Can strategic thinning in *Pseudotsuga*-*Tsuga* forests increase biodiversity or hasten the development of late-successional features in young second-growth forests? Approximately 10 years after variable-density commercial thinning, N fixing and forage lichen species richness increased and lichen community composition was detectably different from pre-thinning data and from unthinned controls. At two sites in moist conifer forests of western Oregon, lichen community monitoring plots were established before thinning treatments; the most diverse plots in each treatment were retained as diversity islands, whereas the less diverse plots were treated in the thinning prescription. At one site, we found that lichen communities in diversity plots were quite similar to those in the surrounding treated forest, and that the proportion of *Tsuga heterophylla* in the stand was negatively associated with alectorioid and cyanolichen richness. At both sites, hardwood gaps and open-grown trees were positively associated with N fixing (cyanolichen) species richness. At the other site, surrounding plots were more like diversity “leave-islands” after thinning than before. Furthermore, thinned plots had more hardwood gaps following the thinning. These thinned plots hosted more *Bryoria*, *Candelaria concolor*, *Leptogium polycarpum*, *Peltigera collina*, *Nephroma laevigatum* and *Physcia tenella* than had been observed prior to thinning. Most of those species are hardwood associates. The forage lichen *Bryoria*, however, is associated with older remnant trees in these stands. Forage lichens may already be responding positively to the opened canopy in these stands, as evidenced by their association with plots having gaps in the canopy colonized by shrubs, and their increased abundance and frequency in 2007 in thinned plots at one of the two study sites. The retention of lichen hotspots appeared to allow rapid colonization of N fixers onto shrubs in thinned plots. Promotion of gaps in the conifer overstory that are dominated by hardwoods probably stimulated richness of N fixers and forage lichens by providing favorable substrates. We conclude that thinning treatments retaining remnants from previous cuttings, open-grown trees, and hardwood gaps have potential to favor lichen communities rich in cyanolichen and alectorioid species.

Keywords: community composition, diversity, epiphytes, forage lichens, nitrogen fixing lichens, thinning.

Editors' suggestions:

Root, H.T.; McCune, B.; Neitlich, P. 2010. Lichen habitat may be enhanced by thinning treatments in young *Tsuga heterophylla*-*Pseudotsuga menziesii* forests. *The Bryologist*. 113(2): 292–307.

Root, H.T.; McCune, B. 2010. Forest floor lichen and bryophyte communities in thinned *Pseudotsuga menziesii*-*Tsuga heterophylla* forests. *The Bryologist*. 113 (3): 619–630.

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