

Conservation of Ectomycorrhizal Fungi: Green-tree Retention Preserves Species Diversity

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Poster Abstract

The Demonstration of Ecosystem Management Options (DEMO) project is a large, interdisciplinary study designed to test the biological and silvicultural effects of green-tree retention in Douglas-fir (*Pseudotsuga menziesii*) forests. Six treatments were replicated on six blocks in Washington and Oregon, USA: no harvest, 75 percent aggregated, 40 percent (dispersed and aggregated), and 15 percent (dispersed and aggregated) green-tree retention. We studied treatment effects on ectomycorrhizal fungi in three of the study blocks. Ectomycorrhizae (EM) were sampled by use of soil cores. Prior to tree felling, one spring and one fall set of cores were collected from each study unit. After the trees were cut, soil cores were again collected in the fall, a full year after cutting, and the following spring. A total of 432 cores were assessed. To test for treatment effects, mean number of EM morphotypes in cores, relative frequency, and species accumulation curves were compared among pre-treatment, control, moderate-thin, heavy-thin, clearcut, and leave groups. All methods of measure showed a reduction of EM in clearcut and heavy-thin treatments. The dispersed moderate-thin treatment (40 percent green-tree retention) showed less reduction in EM types, except in one block, where compaction during logging may have contributed to root mortality. Silvicultural methods that are designed to maintain high levels of biodiversity in a stand are relatively new in forestry. Through green-tree retention, EM diversity is maintained at higher levels than in clearcuts and we expect that retained trees will provide a legacy of ectomycorrhizal fungi during the development of the next stand.

Keywords: ectomycorrhizal fungi, green-tree retention, thinning, DEMO.

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