

AN ABSTRACT OF THE DISSERTATION OF

David L. Waldien for the degree of Doctor of Philosophy in Wildlife Sciences
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Title: Population and Behavioral Responses of Small Mammals to Silvicultural and
Downed Wood Treatments in the Oregon Coast Range.

Abstract approved: _____

John P. Hayes

Forest managers are challenged to provide timber revenues and other resources for society while protecting and enhancing components of biodiversity that are often associated with older forests or older forest structure, such as dead wood. We examined small mammal response to timber harvest in stands 8-10 years following group-selection, two-story, and clearcut harvest, how provision of new downed wood influenced small mammals in group-selection and clearcut stands, and use of downed wood by Townsend's chipmunks (*Tamias townsendii*) in group-selection stands.

Densities of adult and reproductive female deer mice (*Peromyscus maniculatus*) were greatest in harvested stands, whereas other measures for deer mice and Townsend's chipmunks (e.g., densities of male deer mice and male chipmunks), and densities of Oregon voles (*Microtus oregoni*) and Pacific shrews (*Sorex pacificus*) were similar among all stand conditions. Density of vagrant shrews (*Sorex vagrans*) was greatest in clearcut stands and decreased with decreasing harvest intensity.

Although limited data precluded statistical analysis, abundances of northern flying squirrels (*Glaucomys sabrinus*) and western red-backed voles (*Clethrionomys californicus*) were similar between unharvested control stands and group-selection stands. Within two years following augmentation of downed wood, we did not detect

any response of small mammal populations to the downed wood. Our results suggest that small mammal populations can benefit from alternative silvicultural treatments that retain overstory trees and that stands with areas of closed-canopy forest can provide habitat for species that are more abundant in intact and mature forest conditions (e.g., northern flying squirrels).

In our study of use of wood by Townsend's chipmunks, the model indicating disproportionate use of paths with downed wood by Townsend's chipmunk was 22.6 times more likely than the null model, and a chipmunk was 3.0 times more likely to select locations with downed wood at average wood densities (paths with 26% wood). Chipmunks selected wood that was 1.2 times larger in diameter than randomly available wood and there was no evidence that chipmunks disproportionately used wood that was elevated. Our findings document that downed wood is an important habitat component for Townsend's chipmunks and suggest that downed wood influences movements of chipmunks.