



# CALIFORNIA FORESTRY NOTE

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## Growth of Redwood and Douglas-fir Leave Trees Using Variable Retention

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### Abstract

Three even-aged second-growth redwood stands were harvested using a silvicultural system commonly referred to as Variable Retention. The stands were approximately 80 to 100 years of age at the time of harvest. A total of 12, 14, and 18 conifer trees were retained per acre within the units sampled. Trees were retained in a dispersed arrangement. Remnant residual old-growth trees present within the stands were also retained. Four years following cutting, the growth rate of the residual trees had increased dramatically with the basal area increment of the young redwood increasing three-fold, from 0.86 to 2.54 percent per year. The growth of young Douglas-fir also increased, but not nearly to the extent of the redwood. The few residual old-growth redwoods demonstrated a substantial increase in basal area increment. This growth rate increase has implications for accelerating the development of large trees and for impacts to the developing understory.

### Location and Application of Harvest Method

Three separate stands were harvested in 1999 using a silvicultural system called variable retention (Franklin et al. 1997; Mitchell and Beese 2002). The initial plan was to harvest the stands while retaining between 5 and 10 conifer trees per acre. Leave trees were to be scattered and well spaced. Dominant or codominant trees of all species present were to be the primary targets for retention. The five treated stands are located in Jackson Demonstration State Forest (JDSF) within the South Fork of the Noyo River watershed and within the Oski timber sale area. Prior to cutting, the stands were even-aged second-growth redwood (*Sequoia sempervirens*) forest. The average conifer basal area before cutting was 198 square feet per acre in unit J, 365 square feet in unit L, and 514 square feet in unit T, of which 67% was redwood, 13% was Douglas-fir (*Pseudotsuga menziesii*), 4% grand fir (*Abies grandis*) and hemlock (*Tsuga*

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