

# THE YOUNG STAND THINNING AND DIVERSITY STUDY

## MANAGING FOR DIVERSITY



### CASCADE CENTER for ECOSYSTEM MANAGEMENT

#### background

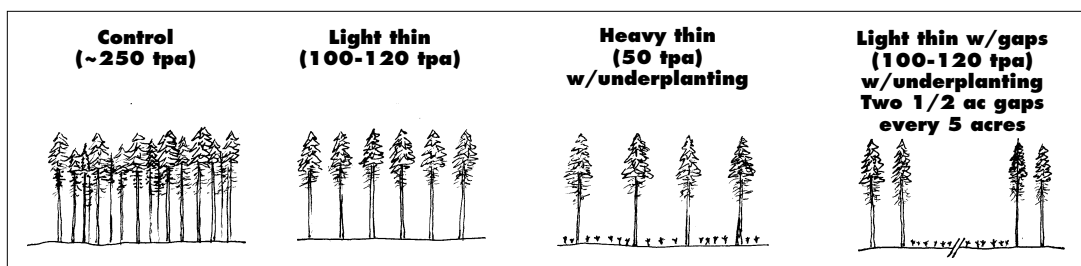
Several million acres of mature and old-growth forests in western Oregon and Washington have been converted to young plantations over the last 50 years. The proportion of older forest in the landscape has steadily decreased over time, while the amount of young managed forests has vastly increased. These plantations often lack the broader range of habitat features found in older forests, or in young stands resulting from natural disturbances. These missing features include large live trees, large dead wood in the form of snags and logs, vertical and horizontal variation in tree canopies, and a significant component of broadleaf trees.

Objectives for federally-managed lands have changed significantly during the last decade, calling into question traditional thinning practices. In addition to unanswered questions concerning timber growth, soil and stand damage, harvesting systems, and economics, new questions have arisen concerning maintenance of biological diversity and ecological processes. In particular, managers, scientists, and members of the public need to know if plantations can be altered through management activities to more closely resemble naturally-initiated young stands, or to more quickly restore features characteristic of older forests.

#### the study

### REMODELING YOUNG STANDS: AN ARCHITECTURE FOR DIVERSITY

In the late 1980s, managers on the Willamette National Forest and scientists from Oregon State University began developing an applied study to address these questions. The *Young Stand Thinning and Diversity Study* is designed to determine if different thinning, underplanting, and snag creation treatments can accelerate the development of late-successional habitat in 35-50 year old plantations. The primary



objective is to better understand how to provide wood fiber while enhancing diversity. The study examines treatment effects on stand growth and mortality, wildlife and plant populations, planning and layout costs, logging costs, soil disturbance, fungi, nutrient cycling, and special forest products like sword fern and Oregon grape.

The study consists of four replications of four stand treatments on three ranger districts of the Willamette National Forest. The stand treatments consist of a *control*, or no

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treatment; a *light thin* of 100-110 residual tpa (trees per acre); a *heavy thin* of 50-55 residual tpa with underplanting; and a *light thin with gaps* – about 20% of the stand consists of 0.5 acre openings that will be planted. Three types of logging systems are also being compared: tractor, cable, and mechanical (harvester/forwarder).

## vegetation

Pre-treatment data were gathered to characterize existing conditions for a variety of response variables. Stand exams were used to determine variation in numbers and species of trees in the overstory, as well as the presence and distribution of understory trees. Line transects were used to determine species composition and abundance of ground vegetation, fungi, fine fuels, and location of root disease centers. The stands are typically 90% Douglas-fir, with western hemlock, western redcedar, incense cedar, red alder, bigleaf maple, chinkapin and Pacific yew present in varying amounts. The stands average 45 years old, 250 trees per acre, 80 feet tall, and 10-12 inches in diameter. Most sites are starting to incur mortality from competition.

## wildlife

Two years of base-line data were collected on small mammals, amphibians, and birds. Forty-four species of birds, 16 species of mammals and 7 species of amphibians were observed. Of the 7 most-frequently detected bird species, 3 are reported to reach their highest abundances in old-growth forests. Very few snag-associated species, such as woodpeckers were observed. The most frequently captured mammal species were deer mice, red-backed voles, and Trowbridge's shrews. The ensatina salamander was the only amphibian captured in the majority of the stands. Bird and mammal species richness (number of species) was positively associated with hardwood stem density. Woody debris was positively associated with the abundance of ensatinas, shrews, and red-backed voles.

## status

Harvest began in November 1994 and was completed in 1996. Permanent photo points were established in each of the replications to monitor changes over time, and to help gauge public reaction to the various treatments. First, third and fifth year post-treatment data have been collected with the next measurements scheduled at year ten.

## communications

Interest in the *Young Stand Thinning and Diversity Study* has been high. Tours, presentations, and workshops have been conducted since 1993. A video was produced by, and is available through, the Oregon State University Forestry Media Center: (541) 737-4702. A publication entitled Communique: Management in young forests, provides a more detailed summary of the study as well as a listing of related studies and publications. To receive a copy, contact Pam Druliner at (541) 822-1213 or pdruliner@fs.fed.us or download from the Young Stand Study section of the Cascade Center website at: [www.fsl.orst.edu/ccem/yst/ystd.html](http://www.fsl.orst.edu/ccem/yst/ystd.html)

