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NEW GROWTH AND YIELD DATA ON CASPAR THIRD GROWTH

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A study established in 1981 to monitor and study the growth response of 18 pre-commercially thinned plots in the coast redwood forest type on the Jackson Demonstration State Forest (JDSF) was re-measured recently. A report documenting the results of the last 12 years of growth response (1987-1998) is being developed currently by the principal researcher Jim Lindquist. Current publication plans are to produce a California Forest Note documenting the results. A brief background and some preliminary results are presented here.

Coast redwood is a unique species with its ability to stump sprout profusely after harvesting and sustain their ability to live under heavy shade. Intense competition among these sprouts will eventually produce several dominant crop trees but with the cost of delaying development of these trees for future harvest. The major objective of this study was to determine an optimal stocking level for young (>20 years old) even-aged redwood stands in order to maximize the diameter growth of the crop trees while fully utilizing the site capacity during stand development.

Five stand densities ranging from 100 to 300 trees per acre as well as un-thinned controls were tested as part of the study design. The pre-commercially thinned stand averaged over 90 percent redwood by basal area with the remainder in Douglas-fir. The 19 year old stand, regenerated from a 14 acre clearcut in 1962, averaged over 700 stems per acre. Number of stems ranged from 400 to over 1000 stems for all trees over 1.5 inches DBH.

This study illustrates the ability of these coast redwood stands to maintain their stand volume production relative to a wide range of stocking conditions as expressed in stems per acre. Statistical analysis of this complete randomized block design indicates no significant differences between treatments for the board-foot inventory values to date. The total periodic diameter growth (PAI) for the 17 year period ranged from a high of over 44,000 bf (averaging over 2500 bf/ac/yr) in the T250 treatment to a low of 29,809 bf (averaging over 1700 bf/ac/yr) in the unthinned with several of the lighter treatment levels just slightly higher than in the unthinned. The accelerated growth of the residual trees in the more heavily thinned plots has been of a magnitude as to keep the stand volume growth at least equal to the more heavily stocked treatments. For example, the number of trees>20 inches in 1998 was almost twice as much (average of 60 trees/ac) in the two heaviest thinning treatments as in the three lightest thinning treatments (average of 34 trees/ac). Overall, the thinning process has left stands comprised of mostly vigorous redwood sprouts larger than 10.5 inches.

However, PAI was statistically significantly different between the thinned plots and the un-thinned controls. Trees>10.5 inches in the 100 and 150 stems/acre treatments (T100 and T150) grew an average of 20.35 inches in diameter (1.69 in./yr) between 1980 and 1998 whereas the T300 stand grew 16.5 inches (1.38 in./yr) and the uncut stands only grew 14.9 inches (1.24 in./yr) in the same time period. Volumes being a function of the diameter squared translates into having a great equalizing effect on stand volume growth.