



STATE FOREST NOTES

1416 Ninth Street
Sacramento, CA 95814
Phone 916-445-5571

No. 72

October, 1978

GROWTH OF YOUNG SIERRA REDWOOD STANDS ON MOUNTAIN HOME STATE FOREST

Norman W. Cook and David J. Dulitz^{1/}

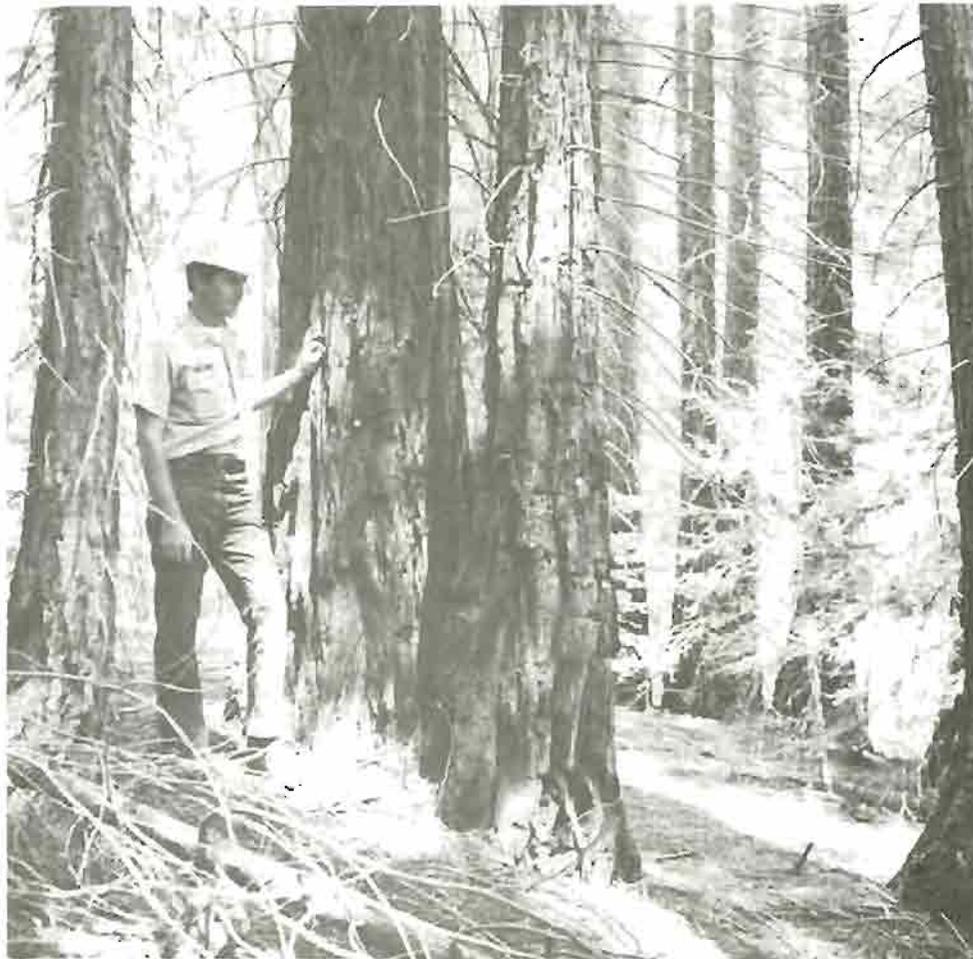


Figure 1. 86 year old Sierra redwood stand on
Mountain Home State Forest.

^{1/}

Respectively, Manager and Assistant Manager of Mountain Home
State Forest, Springville, California.

Growth and mortality plots established in 1952-53 on the Mountain Home State Forest located in Tulare County, California were re-measured in 1976. Of the nine plots established, two were considered to be of special interest because of the high percentage of second-growth Sierra redwood (*Sequoiadendron giganteum*) growing on the one acre sites. Analysis of the data from these two plots will help to determine the effect that the presence of young-growth Sierra redwood has on yield, growth, and cutting cycles of westside mixed conifer stands.

Description of the Plots

In the early 1950's, nine plots measuring 2 chains by 5 chains were established to examine the extent and causes of growth and mortality on cutover stands. These plots were selected on locations that were representative of the various aspects, species, sites, ages and densities existing in second-growth stands on the Mountain Home Forest.

Plot No. 3 was established at the 6,160 foot elevation on a south facing slope that had been heavily logged in 1945, prior to State acquisition of the property. The plot contained only three residual trees of merchantable size when it was designated as a growth plot in 1952. The site was, however, surrounded with veteran old-growth Sierra redwood and other species of cone bearing age. As a result of the soil disturbance that took place, the site became crowded with reproduction. There were 5,420 seedlings per acre on the plot when it was established. Current analysis of stand composition indicates that 45 percent of merchantable trees on the plot are Sierra redwood, 42 percent are sugar pine, and 13 percent are white fir. For the purpose of evaluating yield from this plot, the three residual trees left over from the 1945 logging have been excluded from the volume information.

Growth plot No. 4 was established in 1953 at the 6,250 foot elevation on a south-facing slope in an area adjacent to the long abandoned Frasier lumber mill. Logging in that region of Mountain Home ceased in 1890 and the present stand resulted from the logging disturbance. The plot was considered to be even-aged when measured in 1976 with a species breakdown of 90 percent redwood, 9 percent white fir, and 1 percent sugar pine when only trees over 12 inches d.b.h. were tallied.

Both plots occur on areas that have been designated as Site I (Dunning, 1942) on the soil-vegetation map produced by the Cooperative Soil-Vegetation Survey. The mixture of Sierra redwood with the Sierra mixed conifer type found on these plots represents the typical cutover condition on the Mountain Home State Forest. Other researchers have concluded that there are no pure stands of Sierra redwood found in nature (Hartesveldt, 1975).

Growth and Yield Data

Because of the similarity of these plots, the data has been combined to provide yield information for a longer range of stand age classes. All trees in growth plot No. 3 became established after the 1945 logging; and stand information exists for ages 7 through 31 years for the trees on that plot. Similarly, for growth plot No. 4, stand information has been recorded in detail for years 63 through and including year 86. No attempt was made to normalize the growth information by adjusting for stocking, although it was estimated that plot No. 3 was 45 percent stocked and plot No. 4 was 85 percent stocked. Volumes for young-growth Sierra redwood are from local Mountain Home State Forest volume tables (Wensel and Schoenheide, 1971), and volumes for whitewoods are from the 1956 Forest Survey tables (U. S. Forest Service, 1956).

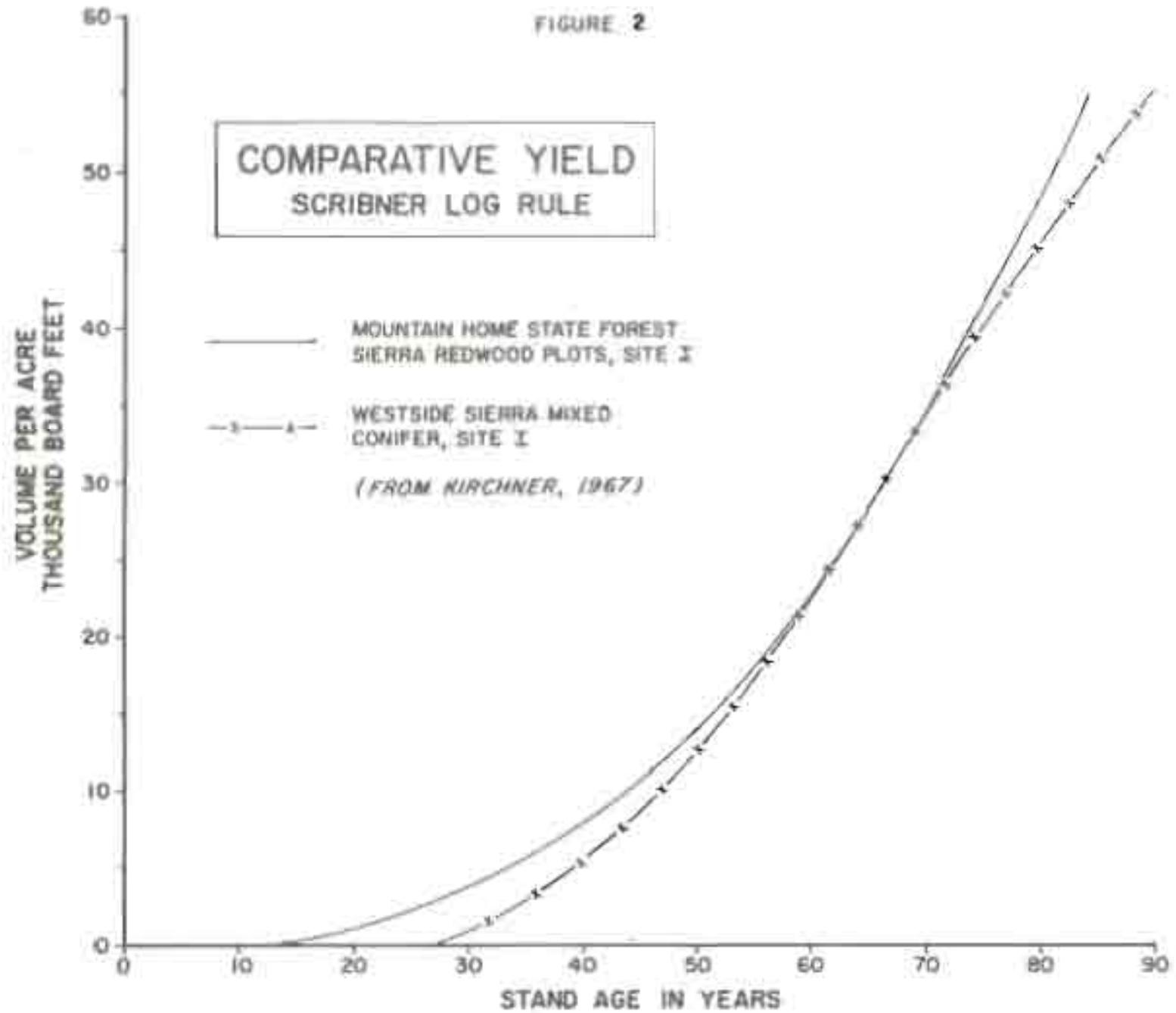
Results of this 86 years of growth on typical cutover Sierra redwood stands on the Mountain Home State Forest are shown graphically and in tabular form (table 1 and figure 2).

Table I. COMBINED GROWTH DATA FOR MOUNTAIN HOME SIERRA REDWOOD PLOTS #3 & #4

Scribner board foot volumes per acre

	Stand Age In Years	Total Volume	Ingrowth	Mortality	Periodic Annual Increment	Mean Annual Increment
↑ PLOT # 3 ↓	7	0	0	0	0	0
	13	0	0	0	38	0
	18	188	188	0	139	10
	22	743	291	0	577	34
	31	5,938	2,966	0	572	192
↑ PLOT # 4 ↓	63	24,237	0	0	1,156	385
	73	35,801	641	0	1,130	490
	77	40,320	69	22	1,566	524
	83	49,714	295	24	1,454	599
	86	54,077	204	0		629

FIGURE 2



Conclusions

Growth rates on these cutover Sierra redwood plots are shown by comparison to be consistent with the yield that can be expected from second-growth mixed conifer stands in the Westside Sierra Region (Kirchner, 1967; Dunning and Reineke, 1933). This demonstrated growth rate, combined with the mechanical properties (Cockrell, 1971), and decay resistance of young-growth Sierra redwood make this species a valuable marketable commodity. Mountain Home State Forest contains an estimated 5,500,000 board feet of merchantable young Sierra redwood, much of which would benefit from careful management techniques. The yield information resulting from this study will be valuable in determining the direction of future young-growth Sierra redwood management.

Literature Cited

- Cockrell, R. A. 1971. Mechanical properties of southern Sierra old and second-growth giant Sequoia. California Agricultural Experiment Station, Bul. 854.
- Dunning, Duncan and L. H. Reineke. 1933. Preliminary yield tables for second-growth stands in the California Pine Region. U.S.D.A. Forest Service, Tech. Bul. No. 354.
- Dunning, Duncan. 1942. A site classification for the mixed-conifer selection forests of the Sierra Nevada. U.S.D.A. Forest Service, California Forest and Range Experiment Station, Research Note No. 28.
- Hartesveldt, Richard. 1975. The giant Sequoia of the Sierra Nevada. U.S.D.A. National Park Service.
- Kirchner, Walter. 1967. A comprehensive analysis of Westside Sierra thinning considerations. U. S. Forest Service, Region V, Sequoia National Forest. Unpublished.
- U. S. Forest Service. 1956. Tenth-inch volume tables for the commercial conifer species of California, Forest Survey. California Forest and Range Experiment Station.
- Wensel, L. C. and Richard L. Schoenheide. 1971. Young-growth gross volume tables for Sierra redwood. Hilgardia, Vol. 41, No. 4.

From: California Department of Forestry
1416 Ninth Street
Sacramento, California 95814

To: