

A SUGAR PINE REGENERATION CUTTING EXPERIMENT

How to save and regenerate California's most valuable tree—the sugar pine, is the subject of an interesting experiment being conducted by the United States Forest Service California Forest and Range Experiment Station in a virgin tract of sugar pine in the Stanislaus National Forest, some 35 miles east of Sonora, Calif.

Cooperating with the Forest Service is the Pickering Lumber Corp., Standard, Calif. The logging is being done by a small experiment station crew using equipment from the Black's Mountain ponderosa pine experiment. Davis S. Carleton, who has had long experience in the sugar pine region and at Black's Mountain, is logging superintendent.

The logs are being hauled from the landing about 30 miles to the Pickering mill by Hubert O. Sharp, Standard log hauling gyppo. Access roads and the logging camp were furnished by the administrative branch of the Forest Service.

Sharp has a fleet of five new Chevrolet logging trucks, pulling Fruehauf two axle trailers. About 4500' is the load, since all but 3 miles of the entire haul is over state highways. About 50-60M' go down the hill to the mill daily, with the grades being 99% in favor of the load.

States Duncan Dunning, California Forest and Range Experiment Station, who is in charge of the experiment: "As old growth, sugar pine is commercially important on some three million acres with an estimated available volume of about 13 billion board feet.

"In young stands, however, this fine tree is losing its important position; volume and quality are low and it seldom makes up more than 5% of the stems. Unless yield and quality of young growth can be increased, high unit costs of protection and management may force sugar pine out of future markets. Although special measures will be necessary in all phases of management, the most urgent first step toward perpetuating sugar pine is to determine whether the research formulae will establish adequate sugar pine reproduction. Stressing this objective, information gathered since 1909 on seed production, seedling survival, stand structure changes and growth was boiled down into a

set of brief rules for the Stanislaus trials.

"The first guide post set up was the regulated stand structure aimed for in old-growth conversion. With high quality saw timber the principal product in view, and considering the high site and tree capacity, the rotation was fixed at 80-100 years, the regulated volume at 52,000 bd ft. to the acre, and the average tree at 22-24 inches d.b.h.

Detailed Inventory Necessary

"The next step was making a detailed inventory of the experimental forest to determine which fractions were already satisfactorily stocked, which needed improvement cutting, and which should be reproduced with new stands. Aerial photographs and early reconnaissance type maps aided in restricting the area that had to be covered in detail on the ground. For this experimental job, ground courses were run at five-chain intervals for a unit-area, or stand condition-class map, which was the basis for cutting and other treatments. Topography was also taken during this survey in sufficient detail for laying out logging roads, skidding trails, and landings.

"On this map the unit-areas requiring separate treatment were distinguished according to five criteria:

1. Composition—the species numerically superior in dominants, both in the merchantable overwood and the advance growth, or understory. This usually determined to which tree species the unit-area was dedicated for the conversion period, and whether group cutting for pine or selection cutting for fir was in order.

2. Age class. Age of the overwood weighed heavily in deciding whether the unit area was to be cut for regeneration, merely improved by selective treatment, or left with its growing stock in reserve.

3. Stocking. Three stocking classes were recognized: overstocked, requiring release and thinning; normally stocked, needing only release; and understocked subject to destruction and replacement, or to supplementing if the dominants were pine.

4. Seed trees. In the case of sugar pine, seed trees were considered adequate if there were dominants 30" dia., or larger on the periphery of unit areas to be regenerated, not

more than 150' from ground to be seeded, and with good cone crops maturing in the current season or season following logging. Sugar pine seed trees were mapped to enable estimating the area requiring seeding or planting.

5. Brush. Note was made of those portions of the area with brush requiring eradication.

"On completion of the condition-class map, the stand was marked for the first cutting and, at the same time, a cut and leave cruise was made and the cut trees were log-graded for the sale appraisal. For use in planning logging and for continuing research the cruise was recorded in 2½-acre blocks. Logging roads, trails, and landings were located on paper, and checked on the ground by the logging superintendent before construction. Logging was begun in mid-July, 1948.

"Where sugar pine is selected for area control, two cutting patterns prevail. Group release cuttings are being made in the few instances where the advance growth has promising pine crop trees. Group seeding cuts are made to start pine in newly created openings on freshly disturbed soil where they can maintain dominance throughout the rotation. The proportion of the area where sugar pine can be maintained is disappointingly small—not more than 20%. Four-fifths of the ground must be resigned to other trees, mainly white fir, at least during the conversion period. On ground dedicated to fir, cutting for reproduction, release and utilization follows the selection pattern.

"The volume and value of timber removed in the first cut, for the area as a whole, averages about the same as for current national forest sales in similar timber. On the average, about 52,000 bd. ft. to the acre is being cut, sugar pine making up nearly one-third of the total. The reserve averages a little more than 33,000 bd.ft.

"The character of trees cut differs from that of prevailing methods in the California region in several respects. Less emphasis is placed on immediate removal of high risk trees. Some large, old sugar pines, not suitable for growing stock, but well located around openings and laden with cones, are retained as seed trees. These will be removed within a year or two. (Turn to page 64.)

Variable Cutting

"The variable cutting is resulting in no unusual difficulties or expense in logging and no trouble has been encountered in maintaining daily log deliveries.

"Although the first cutting is highly important, it is only one of many measures that must be properly coordinated if sugar pine management is to be successful. At least three more cuttings during the conversion period probably will be necessary for release of reproduction

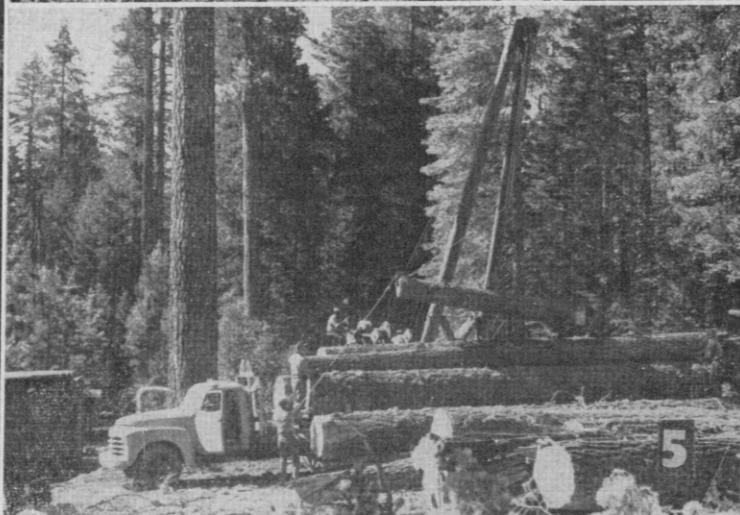
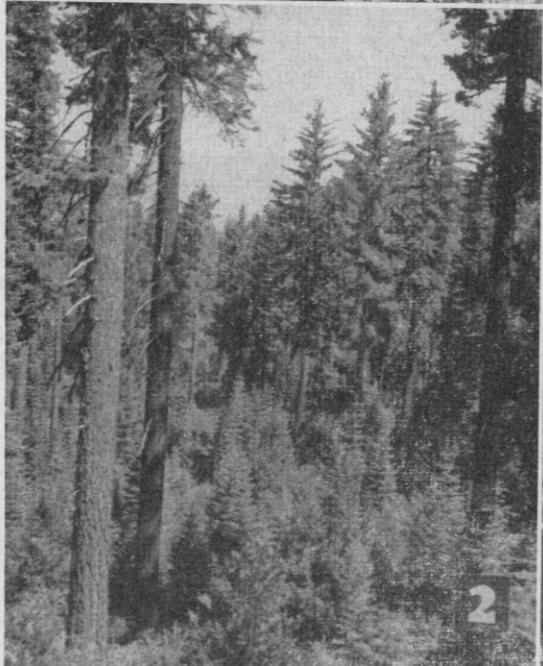
and advance growth, to hasten the growth of reserves, salvage dying trees, harvest maturing timber, and regenerate additional groups as they mature. Two or more thinnings in young growth will be necessary to bring sugar pine through to crop-tree size. Pruning crop-tree pines also will be necessary. Unwanted advance growth fir is selectively culled for Christmas trees to prevent needless loss in regeneration fellings.

"Fill-in seeding or planting with sugar pine will be necessary on at

least 5% of the area even with the best of luck with natural seeding.

"The importance of blister rust control in sugar pine management scarcely needs mentioning. Rodent control also is indispensable.

"First indications of success of the experiment will be looked for in June, 1949, when sugar pine seedlings should make their appearance. The first cutting will produce about three million feet of logs from a little more than 60 acres."



1. A virgin stand of sugar pine with typical understory of white fir and brush. 2. A stand of sugar pine cut-over 24 years ago. Although numerous large sugar pine seed trees were left, the advance growth fir has prevented successful pine reproduction. 3. Advance growth fir and brush have been cleared from within the group of sugar pine seed trees and have been bunched with the slash for winter burning. 4. Heavy slash of tops and cull logs resulting from group clear cutting is bunched with a large tractor and trailbuilder. Lighter slash is heaped up with the heavy material by a small tractor with special brush rake. 5. The variable experimental cutting requires numerous, small landings. An especially mobile log loader is an essential item of equipment. One of Hubert O. Shorp's fleet of Chevrolet trucks, with Fruehauf two-axle trailer, and load of 4500' of pine logs at the deck of the Pickering Lumber Corp., Standard, Calif. Brakes are Bendix-Westinghouse air brakes.