



# STATE FOREST NOTES

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## SUGAR PINE PLANTING ON JACKSON STATE FOREST

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During the winter of 1926-27, as part of the Caspar Lumber Company's reforestation program, various mixed species were planted on an experimental basis in Camp 11 Gulch. Species in this planting included Douglas-fir (Pseudotsuga menziesii) 2-0, sugar pine (Pinus lambertiana) 3-0, California nutmeg (Torreya californica) 1-0, Sitka spruce (Picea sitchensis) 2-1 and Arizona ash 1-0.

The planting is in west central Mendocino County, the central part of the Redwood Region of California, approximately 11 miles from the coast at an elevation of about 750 feet above sea level. The climate is typical of the Coastal Redwood belt. Annual rainfall averages 50 inches and approximate average temperature ranges from a winter low of 25 degrees F. early on cold mornings to 80 degrees in the warmest part of a hot summer day. Not more than a very light snowfall occurs at only very infrequent years. A Mediterranean climatic pattern prevails, with long dry summers, and cool wet winters. Coastal influence of fog or cool coastal air occurs during much of the summer.

The area planted with sugar pine was approximately three tenths of an acre on a gentle south facing slope. The planting was done after the area was clear cut, logged and the slash burned. Gibbs<sup>2/</sup> advised that the area was burned with a hot fire during the summer or fall immediately prior to the planting. The exact seed source is unknown, but records of planting and seed sources at this time indicate that sugar pine seed came from the Sierra's.

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1/ Former Forest Technician, Forest Technician and Senior Forest Technician respectively on Jackson State Forest, California Division of Forestry, Fort Bragg, California.

2/ GIBBS, William H. 1931. Planting cost report and redwood reforestation report of the Caspar Lumber Company (Map shows reforested area of Caspar Lumber Co., March 1927 and March 1928). Unpublished.

In 1946 the State of California acquired the bulk of the Caspar Lumber Company lands, including the area of plantings, which became Jackson State Forest.

### Results

At the end of the first year (1927-28) Gibbs' planting report<sup>3/</sup> for the sugar pine showed 120 trees alive and 88 dead, a survival rate of 57.7 percent.

Surviving sugar pines were examined by Jackson State Forest personnel in January 1957. Diameter at breast height was measured to the nearest 1/10th of an inch for all surviving trees. Heights of sample trees were measured and values curved for remaining heights. Tree crown classes were also noted. A few dominant Douglas-fir in the area were also measured for purposes of comparison. The seed source for these Douglas-fir which developed from natural seedlings is not evident, but more than likely some seed survived the fire and perhaps a few seed trees that survived the logging and fire have since fallen, as they are not now present in the surrounding crown canopy.

Sixty-eight trees were surviving in 1957 or 32.7 percent 30 years after planting. By crown class two trees were dominant, 21 co-dominant, 28 intermediate and 17 suppressed. The average height of dominant sugar pine was 58 feet while comparable measurement for Douglas-fir was 70 feet or 12 feet taller. Diameters at breast height for sugar pine ranged from 2.1 to 15.5 inches with 17 trees 11.5 inches or larger. The basal area was 33.877 square feet for all trees. The cubic foot volume for trees over 3.6 inches d.b.h. was 757.0 cubic feet.<sup>4/</sup> The board foot volume of trees over 7.6 inches d.b.h. was 1,971 feet.<sup>5/</sup>

The sugar pine stand was remeasured and each tree tagged in July 1962. Six dominant Douglas-fir were also tagged and recorded. These six trees are believed to be from natural origin because of their relative position to the planted sugar pine.

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<sup>3/</sup> ibid.

<sup>4/</sup> MUNNS, E. H. and R. M. BROWN. 1925. Volume tables for important timber trees of the United States, western species. USDA Forest Service. 159 pp. Government Printing Office, Washington, D.C. Table 108.

<sup>5/</sup> ibid. Table 107.



Fig. 1. Sugar pine trees on Jackson State Forest 30 years after planting, 1956. Note heavy competition for native vegetation.

Fig. 2. A view of the crowns of sugar pine trees on Jackson State Forest taken in 1963.



By 1962 the basal area of the sugar pine stand had increased to 42.627 square feet, an increase of 8.750 square feet. The average diameter had also increased from 9.5 inches to 10.7 inches. The volume has increased to 1,261.0 cubic feet or 4,202 board feet. These increases are 504 cubic feet and 2,231 board feet respectively for five and one half growing seasons. The crown classes have changed during the past six years. There are now six dominants, twenty-three co-dominants, sixteen intermediates and twenty-three suppressed trees.

In comparison, the average of the six dominant sugar pines in 1962 was 72.2 feet tall in total height and averages 14.1 inches in diameter at breast height while the average of the six dominant Douglas-fir was 92.6 feet in total height and averages 16.1 inches in diameter.

### Conclusion

In the 35-year old sugar pine planting on Jackson State Forest Douglas-fir from natural seed source has outgrown the planted sugar pine trees and dominated them wherever they come into direct competition.

If sugar pine is planted in this part of the north coast area of California pure stands may give the best growth and yield. Seed from sugar pine stands native to a small limited area of the coast in northwest Sonoma and southwest Mendocino counties may be a more desirable seed source for sugar pine planting stock for the north coast area.

White pine blister rust has been found in the natural coastal sugar pine stands previously mentioned in Sonoma and Mendocino counties. As of 1962 the planted sugar pines on Jackson State Forest showed no evidence of blister rust infection. The risk of blister rust infection would seem to require a sufficiently higher stumpage value for young growth sugar pine than Douglas-fir to warrant sugar pine plantings on Jackson State Forest because of the apparent higher yield from Douglas-fir.