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WHITE ALDER (Alnus rhombifolia) REGROWTH FOLLOWING 1968-69 FLOODS by Michael C. Long

Introduction

During the winter of 1968-69, southern California experienced unusually heavy rainfall with flooding in many foothill canyons of the San Gabriel Mountains. Rainfall data for Eaton Wash Dam at 902 feet elevation, near Altadena, indicates precipitation about 100 % above the normal for the 1968-69 season. Total rainfall for the season was 40.59 inches (103.10cm) with the 90-year normal rainfall being 20.43 inches (51.89cm).

Arroyo Seco, about 5 air miles west of Eaton Wash, experienced similar heavy rainfall and flooding. The canyon bottom was drastically altered by the floodwaters and moving debris and in several places along the stream large stands of white alders (Alnus rhombifolia) were completely destroyed by the floodwaters. Visits to the canyon in mid-February of 1969 verified the extent of damage. On successive visits over the next few years, the regrowth of stream-side vegetation was observed and, in particular, the reappearance of alders in stands along the streamside was noted. After several years of regrowth and with the precise age of the young stands being known, it was thought desirable to take measurements to determine the rate of regrowth after flood for the alders.

Methods

White alder stands were sampled in Arroyo Seco Canyon, in the foothills of the San Gabriel Mountains above La Canada, on January 2, 1977 (participants included Steven Bonzo, Colin Fagan, Michael Haradon, and Michael Long). Two representative stands of alders, about 0.25 miles and 0.75 miles, respectively, up-stream from the U. S. Forest Service ranger residence were sampled. Elevation for the stands ranged from 1220 feet to 1310 feet. One-hundred trees

in each of the two stands were sampled at random by walking through the length of the stand parallel to the stream. For each tree the circumference (in cm to the nearest 0.5 cm) was measured at 4.5 feet above the ground (D.B.H.) using steel tapes. The circumference of each tree was divided by Pi (3.14) to determine diameter. The minimum and maximum height for each stand was determined with an

Summary of measurements - White Alders (Alnus rhombifolia), eight-year old stands,
Arroyo Seco, San Gabriel Mountains, Los Angeles County, California

	<u>Location</u>	<u>N</u>	Diameter (cm), <u>mean (stand. dev.)</u>	<u>Range (cm)</u>	Stand Height (m),	
					<u>min.</u>	<u>max.</u>
Stand 1	0.25 mi. N. of U.S.F.S. ranger residence	100	11.83 (5.17) (=4.66 inches)	2.7 - 30.7 (1.06 - 12.09 in.)	6.7 (28.5 ft.)	9.7 (31.7 ft.)
Stand 2	0.75 mi. N. of U.S.F.S. ranger residence	100	10.31 (4.66) (=4.06 inches)	2.7 - 19.4 (1.06 - 7.64 in.)	12.6 (41.3 ft.)	13.4 (43.9 ft.)
Combined total		200	\bar{x} = 11.07 (4.92) (4.36 inches)	2.7 - 30.7 (1.06 - 12.09 in.)	6.7 (28.5 ft.)	13.4 (43.9 ft.)

Abney Hand Level (Dietzgen Co.) by sighting on the tops of the shortest and tallest trees in the stand, respectively. From the angle of slope thus measured and the distance from the observer to the base of the tree, the height was calculated by use of the Pythagorean Theorem. The mean diameter, range and standard deviation were computed for each stand and for the two stands combined.

Results

The mean diameter for all 200 trees measured in both stands is 11.07 cm (4.36 inches), see table. The smallest trees measured were 2.7 cm (1.06 inches) in diameter and the largest were 30.7 cm (12.09 inches) in diameter. Discarding the smallest trees measured as undoubtedly very young secondary growth within the somewhat older stands, the largest trees should indicate maximum growth for the eight-year period (1968-69 to 1976-77).

Thus the maximum growth in diameter per year is 3.84 cm (1.51 inches), with the mean increase per year being 1.38 cm (0.55 inches). The maximum growth in height per year using the tallest trees measured is 1.7 m (5.5 feet).

Sudworth (Forest Trees of the Pacific Slope, 1908, pg. 266) discusses growth in white alder and under "Longevity" he indicates: "Little is known of the age limits. Trees from 12 to 15 inches in diameter are from 37 to 50 years old." The largest trees measured in our 8-year old stand equal the smallest trees cited by Sudworth as 37 years old. Several factors may explain this apparent discrepancy. First, in our stands trees over 20 cm (7.9 inches) in diameter were rare (8 of 200 trees = 4%). Second, it was obvious that many of the trees we measured were re-growing from existing root systems not destroyed by flood. This should provide for more rapid growth than trees established from seed. Finally, growth rate should slow dramatically as the trees reach larger size. Thus the mean diameter of 11.07 cm (or 4.36 inches) may represent the best measure of growth in an 8-year old alder stand and this figure is within reason when compared with older trees cited by Sudworth.

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S.C.B. HIGHLIGHTS OF 1981

The year was another one of growth and achievement for S.C.B.

For the statistical game, we had 271 members at the beginning of 1980 and 405 members by December, 1981. Our book sales in 1981 were \$8,246. Our April, 1981 plant sale grossed \$2,081. Our dues and receipts covered our expenses.

We had our seventh all-day Symposium. This year the subject was "Cacti and Succulents" which we co-sponsored with California



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