

MANAGEMENT OF PLACER COUNTY WATERSHED C
AND TREATMENT RESPONSES

Introduction. The management of the 12.4 acre Placer County Watershed C was initiated in 1963 under the management program listed below.

Program of Treatment and Management: Placer County Watershed C

<u>Year</u>	<u>Season</u>	<u>Operation</u>
1963	Winter	Kill trees using cut surface application of 2-4-D Amine.
	Spring	Kill Poison Oak and other brush using mist blower to apply brush-killer (Sylvex) (2-4-5-T Propionic Ester).
	Fall	Broadcast clover seed at the rate of three pounds per acre each of Rose Clover Mount Barker Sub Clover Crimson Clover
1964	Spring	Follow up spray treatment of Poison Oak and Live Oak sprouts. Kill any trees which were not killed.
1968	Fall	Burn dead trees using grass to carry fire. Seed grass as needed (Harding Grass).

The management has progressed according to the program at a cost to date of \$31.84 per acre for labor and materials.

Vegetation responses. As a result of the applied management, the oak trees on Watershed C are dead with 99% of the trees having been killed and 90 to 95% of the trees remaining standing. Figure 1a shows the two steps in the tree killing operation, and Figure 1b is a view looking up the watershed from the gaging station. Approximately 65% of the poison oak has been killed as a result of the two sprayings. Another spraying for sprout control will be required. The clover seeding was not successful



Figure 1a. Tree killing on Placer County Watershed C. Left photo shows axe cuts being made on the trunk, right photo shows 2-4-D being applied with an oil can.



Figure 1b. View of dead trees on Watershed C looking up the watershed from the gaging station.

in establishing the annual clovers but the grasses have increased in the ground cover. The grass production under the dead trees is two to three times greater than it was under the live trees.

Hydrologic responses. Since the vegetation treatments were applied during the late winter and spring of 1963 the 1962-63 water year will be considered as a pre-treatment year in the analysis of water yield responses. The 1963-64 water year provides the only post treatment data with which to evaluate the effect of the management on water yields. For the present only total annual runoff will be considered. Two methods have been used for evaluating the treatment effect on the runoff from Watershed C by comparison with runoff from untreated Watersheds A and B.

The first method uses a rectangular plot of total annual runoff values for the pre-treatment years of A versus C and B versus C as shown in Figure 2. With a smooth curve drawn through the two sets of points, the total annual runoff values for A and B in post treatment years can be entered on the ordinate to predict a value of runoff for a hypothetical untreated Watershed C. Using this method with the 1963-64 runoff values, the 2.55 inches runoff from A gives a prediction of 3.00 inches runoff from C and the 0.93 inches runoff from B gives a prediction of 3.20 inches runoff from C. These values can be compared with the measured total runoff from C of 6.99 inches to show an increase of 3.9 inches runoff due to the treatment.

The second method uses a double mass plot of cumulative annual runoff values of A versus C and B versus C as shown in Figure 3. For the six pre-treatment years the double mass plots yield two straight lines having the following equations for the straight line of best fit:

$$C = 1.031 A - 3.256$$

$$C = 2.211 B - 4.022$$

The point for 1963-64 deviates markedly from these lines as can be seen by inspection. Using the above equations to predict the accumulated runoff from C at the end of the 63-64 runoff season gives the following:

$$C = 1.031 (38.868) - 3.256 = 36.817$$

$$C = 2.211 (18.320) - 4.022 = 36.484$$

These values can be compared with the measured accumulated annual runoff from C of 41.198 inches to show an increase of 4.5 inches runoff due to the treatment.

The initial hydrologic response to the management of Watershed C has been a 4-inch increase in annual runoff. The 1963-64 runoff summary

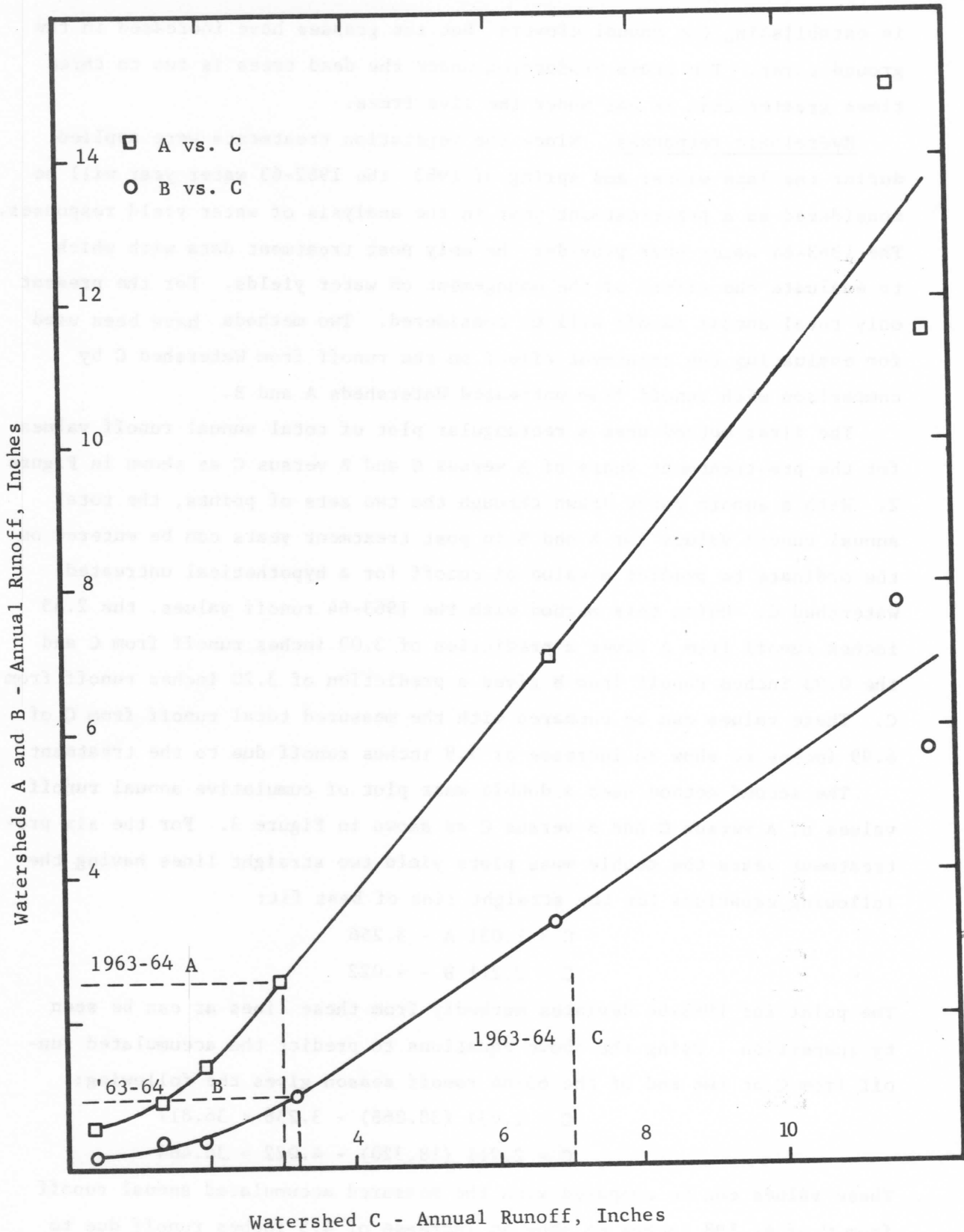
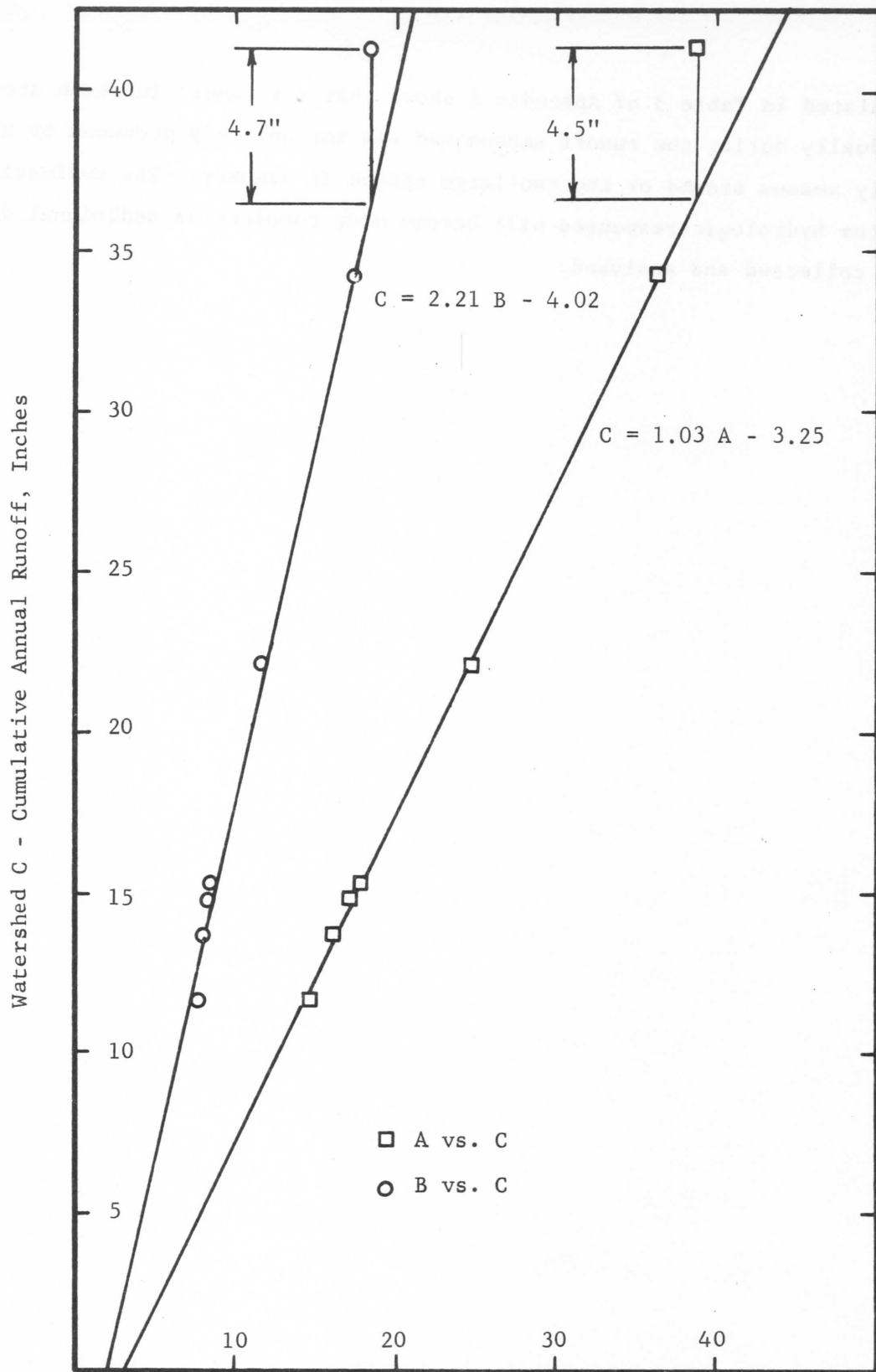


Figure 2. Total annual runoff values for pre-treatment years, Watershed C versus Watersheds A and B. The measured values of runoff from A and B predict 3.1 inches runoff from C, while the measured value from C, shown by vertical dashed line, is 6.99 inches.



Watersheds A and B - Cumulative Annual Runoff, Inches

Figure 3. Double mass plot of cumulative annual runoff, Watershed C versus Watersheds A and B. Lines of best fit were calculated for the six pre-treatment years. Dimension lines show deviation of 1963-64 values from the pre-treatment trend.

tabulated in Table 3 of Appendix A shows that the runoff increase accrued gradually during the runoff season and was not entirely produced by the early season storms or the two large storms in January. The evaluation of the hydrologic responses will become more complete as additional data are collected and analyzed.



Faint, illegible text located below the graph, likely serving as a caption or legend for the data presented.