


RANCHITA RANGE STUDY

SPRING

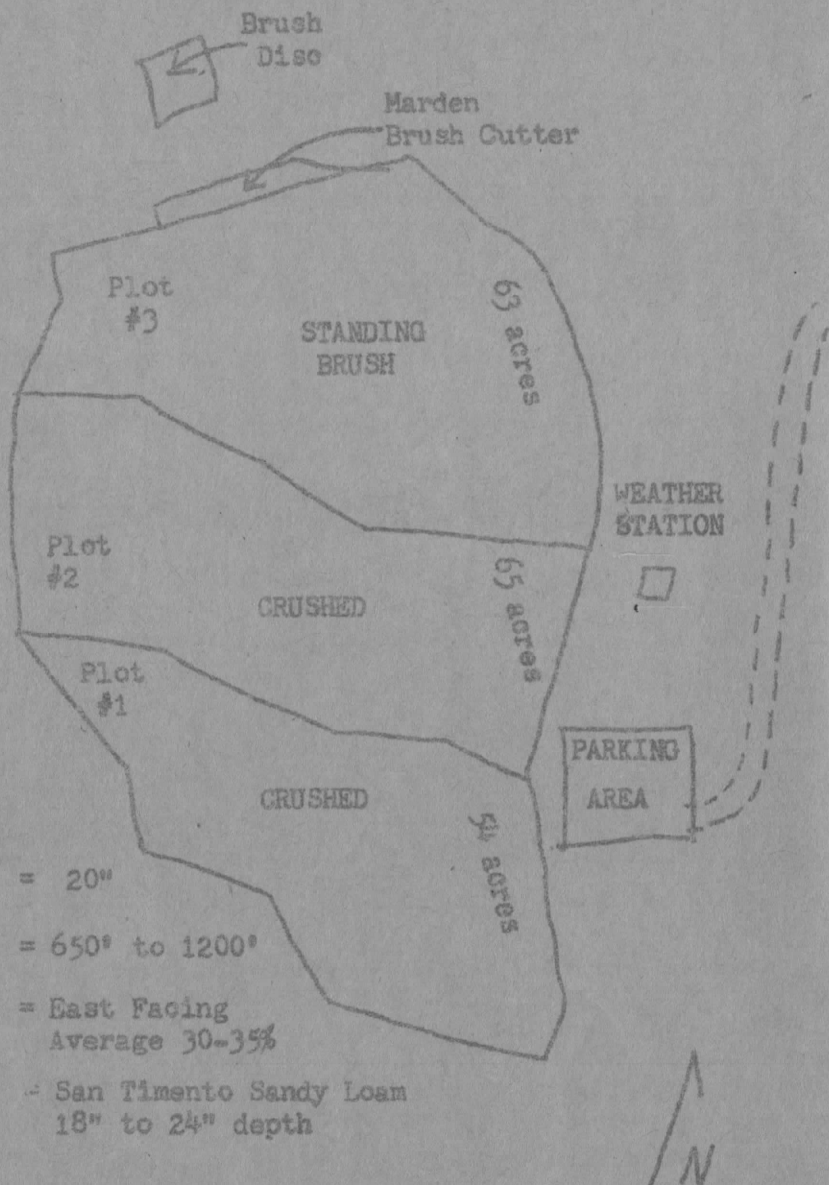
FIELD TOUR

STATE OF CALIFORNIA  
Department of Conservation      DIVISION OF FORESTRY      University of California  
G. B. Hill  
Ranch Owner            Agriculture Extension Service

RANCHITA EXPERIMENTAL  
RANGE STUDY

April 18, 1964

## PLOT LAYOUT



### Fertilizer Trial (Cont.)

This Trial is designed to test deficiencies of the elements nitrogen, phosphorous and sulphur which are usually found to be deficient on rangeland soils. In the late spring, the forage from the plots on the Trial will be harvested and weighed. The results of the addition of these elements to the soil will be analyzed and, if shown to be economical, a selected portion of the Study will be fertilized in the fall on a large scale.

### Follow Up Spraying

The drill seeded portion of both Plots #1 and #2 will be sprayed in late April of 1964 to maintain the area in a brush-free state. Additional areas of the hand seeded portion will be sprayed where it is judged that there is enough forage being produced to justify the expense.

## SUMMARY AND CONCLUSIONS

The study has been successful in demonstrating advanced methods of brushland conversion. It has also shown economic justification for attempting such a conversion with a 70 percent return on the money invested after only 2 grazing seasons. Some of the more important conclusions after four years work on the Study are:

1. Brush crushing with an anchor chain is most effective in old stands of brush. A clean burn can be assured following crushing even in periods of very poor burning weather.
2. Perennial grasses can be best established by drilling where at all possible.
3. No grazing of perennial grass plants in the first year is an important aid for their establishment.
4. Competition from weed and brush regrowth can be controlled with chemical sprays.
5. Grazing management is important for continued high production of perennial grass plants.



## GRAZING MANAGEMENT

### Grazing Trials

Grazing trials have been conducted on Plots #1 and #2 of the Study for two years, beginning in the spring of 1962 (a third season grazing trial is now in progress). No grazing was conducted in 1961, the first year after seeding, in order to give the seeded plants a chance to become established.

Excellent gains were made by the grazing cattle in both trial years. In 1962 a total of 30 heifer grazed Plots #1 and #2 for 76 days. These cattle gained a total of 4,200 pounds during the 1962 trial for an average gain of over 35 pounds per acre.

In 1963 the Study was grazed by 31 steers for a period of 112 days. These cattle gained a total of 5,321 pounds for the grazing period averaging almost 45 pounds of gain per acre.

The results of these two years of grazing are very satisfactory. If the selling price of feeder cattle is figured at \$.25 per pound, the total gain of 9,521 pounds represents an income of \$20.01 per acre for the first two years grazing.

## PRESENT AND FUTURE WORK

### Fertilizer Trial

An exploratory fertilization Trial was established on the Study October 15, 1963. The purposes of the Trial are: 1) determine what nutrients are deficient in the soil on the Study and, 2) to analyze the economic aspects of rangeland fertilization as related to increased forage production.

## RANCHITA RANGE STUDY

The Ranchita Range Study is a cooperative brush conversion project. It is being conducted by the California Division of Forestry, the Agriculture Extension Service and the Grover B. Hill Company (ranch owner). The purposes of the Study are: 1) to demonstrate brush range improvement techniques developed by research and, 2) to determine and show the economic returns of the various treatments.

Work first began on the Study in February of 1960. At that time brush was crushed in preparation for burning on what are now Plots #1 and #2 (see opposite page). This was followed in the fall by burning and reseeding with perennial grasses. In the spring of 1961, the area treated was sprayed with chemicals for control of brush and weed regrowth. Since that time various treatments have been made to maintain and enhance the value of the Study, including yearly grazing trials after the second year. The following pages gives a breakdown of the treatments involved in this conversion, along with a breakdown of costs.

An unsuccessful attempt was made at burning the standing brush on Plot #3 at the same time the crushed plots were burned. Since that time no further work has been done on Plot #3 and it remains only as a comparison for the brush crushing done on the other two plots.

For this reason only the 119 acres of Plots #1 and #2 are reflected in the work accomplishments in this brochure.

## BRUSH REMOVAL

### Brush Crushing:

Brush was crushed on Plots #1 and #2, February 1960, to secure a better and safer burn. Crushing was done with an anchor chain pulled by two tractors (TD-18's). Once techniques for handling the chain were worked out, an average of 3 acres per hour was crushed in rolling country and four acres per hour on steep canyon sides.

### Results:

Crushing was satisfactory on old brush stands but not so good on young brush stands. Work was planned for November of 1959 when brush was brittle. Equipment was not available due to long fire season. By the time work could be done in February of 1960, sap was up and brush was very limber.

Cost of crushing 95 acres:  
\$4.37 per acre                      TOTAL \$415.20

### Fire Line Construction

Lines were constructed around Plots #1, #2 and #3 in February 1960. Double lines were cleared about 75 feet apart with brush crushed between them. Intervening strip was to be burnt as soon as grass was dry; an economical method of providing wide fire lines with a minimum of soil disturbance. Dozer time - 13 hours.

### Results:

Results of the follow up spraying were very good on the area treated by the mist blower but only fair on the area treated by the hand carried spray cans. Additional follow up treatment will be necessary to maintain the area brush free:

Cost of follow up spraying on 68 acres:  
\$3.67 per acre                      TOTAL \$249.46

### Erosion Check Dams

In early December of 1961 a system of 8 erosion check dams was constructed in the gullies of Plots #1 and #2 in an effort to check erosion, increase infiltration and halt soil deposition below the project. A small TD-9 was used for dam construction.

### Results:

Dams worked very well. All were nearly filled with silt after the heavy rains of early 1962. Only one dam washed out and the silt from it was collected in another dam below. Hardly any additional soil and silt were deposited below the project.

Cost of dam construction:  
\$9.30 per dam                      TOTAL \$74.40

Cost of second year dam cleaning:  
\$6.12 per dam                      TOTAL \$48.95

## PROJECT COSTS SUMMARY

Total chargeable costs for the conversion work done on the 119 acres of Plots #1 and #2 are:

Total Chargeable Cost                      \$3,383.63  
Average Cost per Acre                      28.43



## FOLLOW UP CONTROL

### Spraying:

Approximately 110 acres of Plots #1 and #2 were sprayed with a 2,4-D + 2,4,5-T herbicide mixture by helicopter on May 3, 1961. This spraying was done to control brush regrowth and competing weeds. Following is the mixture used and the application rate:

2,4-D + 2,4,5-T (4 lbs. acid)	1 gal. per acre
Diesel	1 " " "
Water	8 gals. " "
<b>TOTAL</b>	<b>10 gals. per acre</b>

### Results:

Results of spraying were very good. Measurements taken in March of 1962 show a density decrease of brush sprouts of 73% and a density decrease of native forbs of 65%. Respectively, both the seeded grasses and native grasses showed a substantial increase over the area.

Cost of spraying 110 acres:

\$9.57 per acre                      TOTAL \$1,052.26

On May 23, 1962, approximately 68 acres of Plots #1 and #2 were spot sprayed with a herbicide mixture of 2,4-D and 2,4,5-T in an effort to kill the surviving brush sprouts. Both a backpack mist blower and hand operated spray cans were used for this follow up work. Below is the herbicide mixture used for this follow up work:

2,4-D + 2,4,5-T (4 lbs. acid)	1 gal.
Diesel	1 gal.
Water	3 gals.
<b>TOTAL</b>	<b>5 gals.</b>

### Results:

Results were not as satisfactory as desired. Work was planned for November when brush was brittle, but equipment was not available then due to long fire season. By time work could be done in February, sap was up and brush was very limber. So fire lines were cleaned out with dozer. Total dozer time - 26 hours.

Cost of fire line construction (119 acres):

\$1.48 per acre                      TOTAL \$176.12

### Oak Tree Poisoning:

Work was done on about 4 acres at lower end of Plot #2. Trees were frilled and treated with brush-killer mix of 2, 4-D and 2,4,5-T. 155 trees treated on 4 acres requiring 4 man-hours of work. One gallon of chemical was used at a cost of \$7.17 per gallon.

Cost of poisoning including labor:

\$.10 per tree                      TOTAL \$15.17

### Brush Burning and Results:

Plots were burned on October 19, 1960. Day turned out very poor for burning (humidity never dropped below 50%). A good burn was secured on heavy brush where chained down. Poor burn resulted on light brush even where it was chained.

Cost of equipment and materials for burning 119 acres:

\$1.92 per acre                      TOTAL \$228.48

## REVEGETATION

### Seeding

Approximately 34 acres of Plots #1 and #2 were seeded November 19-24 of 1960, using an Extension Service Range Drill pulled by a CDF tractor (TD-9). The 34 acres were drilled in 26 hours of operating time.

During the same period an additional 34 acres of the steep slopes in Plots #1 and #2 were seeded by hand. A total of 24 man-hours were used in this operation.

Following is the seed mixture used for the above seeding:

Harding grass	3.2 lbs./acre
Perennial ryegrass	1.1 lbs./acre
Smilo	0.7 lbs./acre
TOTAL	<u>5.0 lbs./acre</u>

Approximately 69 acres of Plots #1 and #2 were hand seeded with a legume mixture December 5, 1961 (roughly the same area as was seeded with the perennial grasses). The seed mixture consisted of burclover and lana vetch which was seeded at two different rates: Approximately one-half the area seeded was seeded at the rates of  $1\frac{1}{2}$  lbs. burclover to 5 lbs. lana vetch, and the other half seeded at the rate of 4 lbs. each of burclover and lana vetch. A total of 40 man-hours was used for this operation.

### Results:

Results on the 34 acres drill seeding with the perennial grasses were very good. In April of 1961 these seeded grasses covered 15% of the total ground area. In spite of an estimated loss of 50% of the seeded plants during the summer of 1961, they increased to cover 30% of the total ground area by March of 1962 and have continued to increase since.

Cost for the drill seeding including seed (34 acres):	
\$14.38 per acre	TOTAL \$489.01

Results of the 34 acres of perennial grass hand seeding were only fair. In April of 1961 these seeded plants covered 1% of the total ground area and increased to 4% by March of 1962. Further increases have been observed yearly.

Cost for hand seeding grass including seed (34 acres):	
\$7.57 per acre	TOTAL \$257.38

The legume seeding was almost a complete failure. This failure, we believe, was due largely to birds eating the uncovered seeds and severe competition from seeded and native grasses.

Cost for the legume seeding including the seed (69 acres):	
\$5.47 per acre	TOTAL \$377.20