

RR  
MANAGEMENT  
Utilization standards  
Pine ranges

January 18, 1941

Forest Supervisor  
Modoc National Forest  
Alturas, California

Dear Russ:

Reference is made to Hermy's letter of November 12 in which he promised to send you a brief report and summary of the work done last fall on bitterbrush on the Modoc. The report as roughed out by Hermy follows. You will appreciate that it is not a finished report, and yet we hope it may have some reference points of current interest to you and your staff.

"Enclosed are a few tables which summarize the work that was carried out on bitterbrush near Badger Well on the Modoc this last fall. These data give a picture of conditions at the time of treatment. Changes will start to show up in next year's measurements. There are, however, some interesting points that can be noted at the present time.

Of the eight or ten areas that were ripped up there was time to examine only six. Four of these were on unburned range and two on burned. All were in the open ponderosa-jeffrey pine type. There was a moderate to heavy stand of bitterbrush in the understory on the unburned range and a light stand on the burned range.

Comparable undisturbed areas were selected to serve as checks next to each of the ripped areas. Selection was not always easy for two reasons: first, reconstruction of the picture of what areas were like before treatment left much to be desired; and second, it was found that ripping was carried through comparable areas and often nothing was left to serve as a check. In future efforts of this kind where quantitative measurements are needed, comparable areas should be selected before treatment.

An area 8 chains long and 4 chains wide was laid out within the ripped and nonripped areas and two transect lines were run lengthwise through each. All measurements were made on these transects. See figure 1, page 1, for a diagram of this set-up. Figure 2 indicates how all ripped areas and nonripped areas can be contrasted in a general comparison. Each

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area can also be considered independently. The burned areas (4 and 5) were so different from the unburned that they were analyzed separately.

The summary for the unburned range is given in table 1, page 2. Nearly half of the bitterbrush plants were ripped out on the treated plots. Such drastic treatment should bring about a growth response in the remaining surviving plants. The breaking up of the forest floor has resulted in a seedbed that should favor the growth of both bitterbrush and pine seedlings. The bitterbrush plants averaged about 15 inches high and 13 inches in diameter and were moderate to heavily utilized, as indicated by their shape. A partial loss of vigor, due possibly to grazing as well as other environmental factors, was reflected by the 20 percent deadwood in the crowns.

There was a general lack of seedlings on these areas. The 2.3 average per transect is negligible in itself. Even some of these plants which were classified as seedlings -- by definition a plant less than 0.25 inches in stem diameter -- were more than 2 or 3 years of age. Some plants of comparable size on which ring counts were made were as much as 10 years old. I believe I did not see more than one or two plants that could have been considered this year's seedlings on all the transects.

Fred Douthitt, of the Regional Office, assisted in this work for a couple of days and he pointed out the large number of seeds that could be found under some of the bitterbrush plants. We collected some of these and are subjecting them to a germination test. It would seem that on at least some of these areas, considerable seed is available for new establishment. The remains of hundreds of bitterbrush seeds were found on the trunk of a fallen snag, indicating that some rodent (possibly the chipmunk) collects and eats the seed.

Calculations show that the difference in the number of established plants on ripped and nonripped areas amounts to 47.6 percent in favor of the latter. This is a significant figure. However, the differences for the other criteria were not significant and could have been due to sampling.

Differences in the bitterbrush stand on the burned and unburned range are apparent in the tables. Far fewer plants were observed on the burned range. They were much smaller and more closely utilized. No small plants approaching seedling size were found. The apparent difference between certain factors is quite large in some instances. For example, there is a 58 percent difference in the number of established plants, a 17 percent difference in height, and a 32 percent difference in percent of crown dead. None of these figures are significant, however. The differences could have been due to sampling. Stated in a more practical way, field variation was so great that four transects in ripped and nonripped areas were not sufficient to detect the differences observed. We have the alternative of selecting more comparable areas in cases like

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this or increasing the number of areas on which measurements are made. I have purposely outlined some of these technical points to indicate the alternatives we have for increasing the accuracy and sensitivity of our comparisons.

In addition to those on bitterbrush, records were made on the number of pine seedlings that were present on the transects. A seedling was defined for this purpose as a tree less than 12 inches high. There were very few trees of this size (table 3). As I write this memo I notice that I should have made a record of trees of all sizes on the transects to give an indication of stocking. This will have to be done next summer. However, I doubt if there were more than 20 trees of all sizes on all the transects combined. This means that reproduction in general is lacking and the trees in the mature stand are widely spaced.

This background picture indicates that we should be able to detect even a scant catch of either bitterbrush or pine seedlings on these areas. "Reasonable" differences due to treatment will probably show up on the unburned range, but much greater differences will have to develop on the burned range before they can be detected because only two areas were contrasted.

To get an indication of the utilization of bitterbrush by deer during the winter, five additional transects each 2 chains long and 3.3 feet wide were established on which the utilization of each bitterbrush plant was estimated. These plots will be reexamined before the sheep come on to the range next spring. Table 4 summarizes the measurements made. The average utilization on October 22 of all of the plants on the transects was 19 percent. I tried to select areas where the utilization was light so that any appreciable grazing by deer would have a chance of showing up.

I hope this work will give us a few leads on some aspects of the bitterbrush and pine-reproduction problems."

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This work is probably of interest to the other Eastside forests even though their bitterbrush problems are not as acute as on the Modoc. To get such information to them we are planning to start a series of letters called "Eastside Range News", reporting on the progress of experimental work. As a start we may include the highlights or even all of the above report in the first or second issue.

Sincerely yours,

M. W. TALBOT  
Acting Director

Enclosures

MA

ALH

**EXPERIMENTAL DESIGN**

**Growth and Reproduction of Bitterbrush**

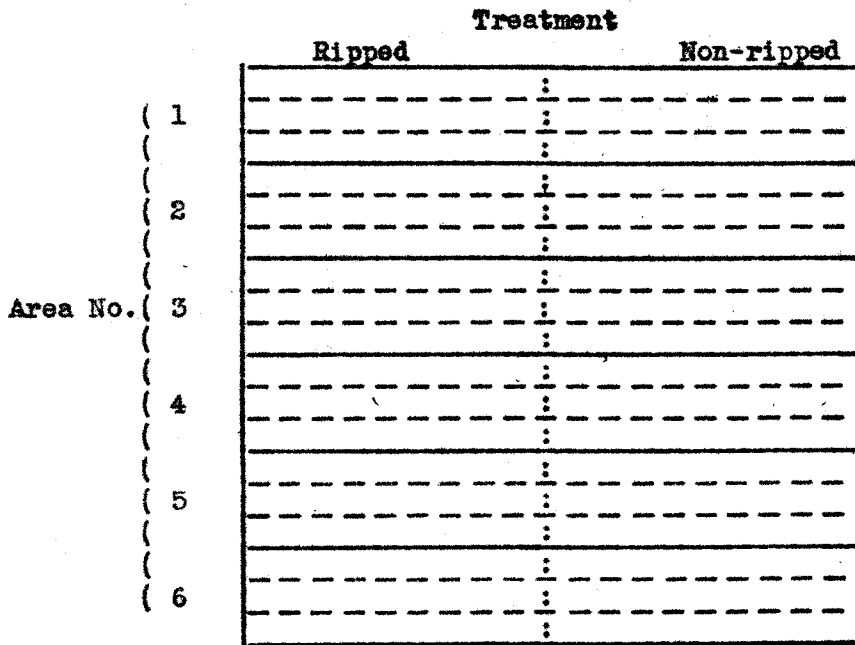


Fig. 1

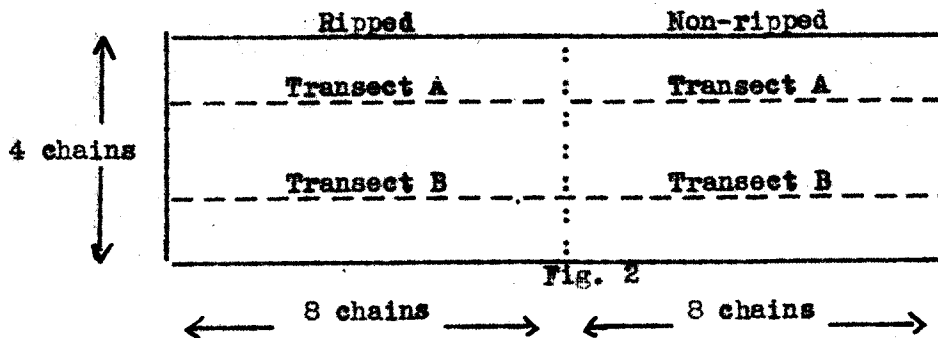


Fig. 2

Transects are 8 chains long and 3.3 feet wide within each treatment.

Total area covered by all transects = 0.96 acres.

JK

I. Effect of heavy soil scarification on the growth and reproduction of bitterbrush on range grazed by sheep and deer.

Table 1.

Unburned range

Measurements per area	Treatment		Differ- ence	Percent	
	Ripped	Non-ripped			
1. Number of established plants <sup>1/</sup>	122.0	233.0	111	47.6	Sig. <sup>4/</sup>
2. Average height (inches)	14.8	14.4	0.4	2.8	N.S.
3. " diameter (inches)	13.0	13.3	0.3	2.3	N.S.
4. Shape <sup>2/</sup>	No.2	No.2	-	-	
5. Average percent crown dead	20.0	19.7	0.3	1.5	N.S.
6. Number of seedlings <sup>3/</sup>	2.3	2.3	0	0	

Note: Area = 0.08 acres = 2 transects 8 chains long by 3.3 ft. wide  
 Above figures based on 4 areas.

Table 2

Burned range

Measurements per area	Treatment		Differ- ence	Percent	
	Ripped	Non-ripped			
1. Number of established plants <sup>1/</sup>	21.5	51.0	29.5	58.	N.S. <sup>4/</sup>
2. Average height (inches)	6.2	7.5	1.3	17.	N.S.
3. " diameter (inches)	6.6	7.2	0.6	8.3	N.S.
4. Shape <sup>2/</sup>	No.3	No.3	-	-	
5. Average percent crown dead	10.4	15.4	5.0	32.	N.S.
6. Number of seedlings <sup>3/</sup>	0	0	0	0	

Note: Area = 0.08 acres = 2 transects 8 chains long by 3.3 ft. wide.  
 Above figures based on 2 areas.

<sup>1/</sup> Stem diameter greater than .25 inches) arbitrary definitions.  
<sup>3/</sup> " " less " .25 " )

<sup>2/</sup> No. 1 Erect diffusely branched -- light or no utilization.  
 No. 2 Branching evident but suppressed -- moderately to heavily used.  
 No. 3 Mushroom-shaped -- heavily to severely hedged.

<sup>4/</sup> Sig. = Significant.  
 N.S. = Not significant.

II. Effect of heavy soil scarification on the reproduction of ponderosa and Jeffrey pine on range grazed by sheep and deer.

Table 3.

Measurements per area	Treatment		Differ- ence	Percent
	Ripped	Non-ripped		
Total number of seedlings less than 12 inches high on 6 areas (0.48 acres)	2	4	2	50

III. Utilization of bitterbrush.

Table 4.

Measurements per area	Average <sup>1/</sup>	
1. Number of plants	32.4	(Total 162)
2. Diameter (inches)	18.4	
3. Growth of terminals (inches)	5.2	
4. Percent utilization (by sheep and deer)	19.0	(On Oct. 22)

<sup>1/</sup> Based on 5 transects each 2 chains long by 3.3 feet wide.

Total area covered by transects = 0.05 acres.