

Feb. 18, Am. Leg. Hall  
731

Jim Street  
14400

THE RANGE IMPROVEMENT PROGRAM

Annual Report - 1952.



State of California  
Department of Natural Resources  
Division of Forestry

## C O N T E N T S

	Page
The Action Program . . . . .	1
Land Clearing . . . . .	1
Stand-by Services . . . . .	2
Reseeding . . . . .	6
Controlled Burn Escapes . . . . .	6
Range Improvement Committees. . . . .	7
Trends and Developments of the Range Improvement Program. .	8
Field Studies in Range Improvement . . . . .	12
Summary. . . . .	13

## THE RANGE IMPROVEMENT PROGRAM

Annual Report--1952

The range is one of California's great natural resources. Like other reproducible resources, its continued productivity can only be assured by judicious use and careful management. Range improvement may be defined "as the process of replacing a relatively undesirable population of plants with a more desirable type of forage." The steps required in a sound plan of range improvement include:

1. Removal of present nonproductive cover;
2. Revegetation of cleared areas with plants suitable for forage production; and
3. Planning and carrying out of a long range grazing program.

The need for a coordinated approach to California's range problem has been recognized by the California Legislature. Statutes were adopted in 1945 (amended in 1949) which authorized and defined the Range Improvement activity of the Division of Forestry. This activity can be classified as two phases: an action phase and an investigative phase.

### THE ACTION PROGRAM

The action phase deals with the range improvement projects of ranchers. It includes land clearing by controlled burning and mechanical clearing, reseeding, and management of the cleared areas. In this phase the State Division of Forestry functions in an administrative capacity to inspect areas proposed for burning, advise on preparations and issue permits. Our active participation here is through furnishing stand-by crews for protection of adjacent property. Our technicians are available to assist ranchers in their brush range problems.

#### Land Clearing

Fire, under controlled conditions, is employed in most land clearing projects on the foothill ranges. There is some acreage where brush is cleared by bulldozing and piling; in many of these cases no burning is done, while in others fire is used during that part of the year when permits are not required.

#### Controlled Burning

During 1952 ranchers made 750 applications to the Division of Forestry for permits to do controlled burning. These applications covered a total of 246,545 acres of land. Controlled burns were completed by 617 permittees during the year. Many applications involved several ranchers so a total of 401 burns were made. Of these 315 were completed by individuals while the remaining 86 were co-operative projects by two or more ranchers. It will be noted that cooperative effort in controlled burning projects is increasing. There were 57 such cooperative burns in 1951 compared with the 86 in 1952.

The total area burned under permit was 181,710 acres. In addition 9,103 were burned by escapes making an aggregate of 190,813 acres treated by fire during the calendar year.

The above figure of 190,813 acres includes 45,464 acres which was re-burned during the year. When the area reburned is subtracted, it leaves a net total of 145,349 acres.

It appears that the use of equipment for preparing areas for controlled burning is being widely practiced throughout the State. For the most part this use consists of crushing or mashing the brush in place on some variation of the area ignition technique. It may range from breaking down a strip inside the fire-line so the fire is given an initial impetus to complete crushing of the entire area to be burned.

#### Mechanical Treatment

The brush on 13,081 acres was broken down or bulldozed into windrows and piles before burning. An additional 21,182 acres was cleared by mechanical methods, mainly bulldozing, where no burning was done under permit. (Our figures on mechanical clearing are not complete, as much of this work is done under the PMA Program and does not require the use of fire. Unless the brush is disposed of by burning under permit our personnel do not ordinarily contact ranchers on mechanical clearing activity.) These data indicate some type of mechanical treatment was applied to more than 34,263 acres during the year.

Table 1 summarizes land clearing activity with which the Division has been concerned since 1945, while Table 2 gives details of the 1952 activity.

#### Stand-by Services

Stand-by services were furnished on range improvement projects as authorized by the Legislature. The purpose of this stand-by service is to provide additional fire protection to lands which may be endangered by control burning activities. The Division of Forestry continued its policy of supplementing the special stand-by crews with forces from our regular suppression organization when their services could be spared.

During this past year 476 (63.5%) of the applicants requested stand-by service. The Division was able to provide this service for 405 (94.8%) of those permittees who requested it and completed control burns. Stand-by was furnished for 248 (61.8%) of the total of 401 burns. On an acreage basis, stand-by service was provided for 136,559 (75.1%) of the 181,710 acres burned under permit. There were 4,491 acres of escape on burns where stand-by service was provided. The rate of escape was 3.3 acres per thousand acres burned under permit where these crews stood-by, compared with 10.2 acres per thousand acres where they were not present.

Stand-by services of the Division are summarized in Table 3.

Table 1. Summary of Land Clearing Data, 1945-1952, Inclusive.

Activity	1945	1946	1947	1948	1949	1950	1951	1952	Total
No. of Applications	*	266	216	180	408	469	558	750	2,847
No. of Permittees	252	212	170	154	344	337	438	617	2,524
Ac. Burned Under Permit	50,424	54,164	32,945	24,462	87,909	83,249	133,885	181,710	648,748
Ac. Burned by Escape	15,232	9,320	6,106	6,786	14,628	14,125	19,653	9,103	94,953
Ac. Cleared Mechanically	*	2,250	15,873	1,910	19,289	5,059	3,411	21,182	68,974
Total Acres Treated	65,656	65,734	54,924	33,158	121,826	102,433	156,949	211,995	812,675
Less: Acres Reburned	*	*	*	*	*	*	14,847	45,464	60,311
Net Acreage	*	*	*	*	*	*	138,691	145,349	284,040
Acres Reseeded	*	24,574	17,253	15,103	34,760	28,493	35,469	53,032	208,684
Percent Reseeded	*	38.7	44.2	48.3	33.9	29.3	23.1	27.8	
Av. Size Permit Burn	200	255	194	159	256	333	468	453	

\* Data not available.

Table 2. Summary of Controlled Burn Statistics, 1952

County	No. of Appl.	No. of Per- mits Used	No. of Burns	Acres To Burn	Acres Burned Under Permit	Excess Acres Burned	Total Acres Control Burned	Acres Bull- dozed & Burned	Acres Re- burned	Acres Seeded	Standby Re- quested	Stand- by Used
<b>DISTRICT I</b>												
Colusa	4	4	4	1,225	1,215	---	1,215	5	---	300	4	1
Del Norte	1	1	1	1,000	1,000	---	1,000	600	---	1,000	-	-
Humboldt	49	37	32	7,655	4,987	12	4,999	527	2,780	2,663	-	-
Lake	25	16	14	4,437	4,012	1,150	5,162	15	1,922	1,295	12	5
Mendocino	124	97	87	35,962	21,238	783	22,021	574	5,503	7,138	35	21
Napa	23	13	12	10,980	4,235	200	4,435	3	835	6	10	5
Sonoma	48	41	38	18,805	10,158	2,850	13,008	331	5,513	4,255	27	6
Yolo	6	4	4	4,020	3,300	---	3,300	---	800	---	---	---
TOTAL	280	213	192	84,084	50,145	4,995	55,140	2,055	17,353	16,657	88	38
<b>DISTRICT II</b>												
Butte	10	10	5	5,320	5,320	5	5,325	400	2,920	370	9	9
Shasta	40	40	17	23,210	23,440	414	23,854	250	480	3,777	40	39
Siskiyou	5	4	4	2,420	680	19	699	30	---	490	5	4
Tehama	2	2	1	2,900	2,900	4	2,904	---	500	---	2	2
TOTAL	57	56	27	33,850	32,340	442	32,782	680	3,900	4,637	56	54
<b>DISTRICT III</b>												
Amador	46	37	33	5,998	4,043	38	4,081	2,300	1,793	1,395	34	31
Calaveras	27	23	11	7,495	6,125	1,265	7,390	380	3,190	430	26	23
El Dorado	27	23	22	2,665	2,315	463	2,778	730	470	329	23	20
Nevada	32	29	17	4,448	3,138	94	3,232	1,074	1,523	348	29	29
Placer	8	7	3	2,575	2,500	14	2,514	15	15	35	6	5
Sacramento	1	1	1	80	80	---	80	80	---	50	1	1
Tuolumne	19	15	5	7,493	7,323	10	7,333	---	3,653	905	9	14
Yuba	6	6	2	579	579	---	579	30	---	68	4	4
TOTAL	166	141	94	31,333	26,103	1,884	27,987	4,609	10,644	3,560	132	127
<b>DISTRICT IV</b>												
Fresno	56	53	12	11,754	9,154	25	9,179	1,086	---	3,638	50	52
Kern	5	---	---	3,460	---	---	---	---	---	---	3	---
Madera	28	24	10	9,767	9,303	---	9,303	589	6,680	1,095	25	24
Mariposa	63	58	20	14,604	14,299	190	14,489	1,270	2,797	2,002	52	50
Tulare	9	9	4	1,224	1,024	---	1,024	607	---	890	9	9
TOTAL	161	144	46	40,809	33,780	215	33,995	3,552	9,477	7,625	139	135
<b>DISTRICT V</b>												
Monterey	23	21	19	9,698	3,956	---	3,956	1,365	50	1,020	12	10
San Benito	4	2	1	11,600	6,560	525	7,085	---	---	3,760	4	2
S.L. Obispo	35	26	8	21,260	16,570	780	17,350	50	---	15,110	28	26
Santa Clara	4	3	3	3,040	2,940	240	3,180	---	1,040	---	4	3
Stanislaus	1	1	1	7,000	6,840	---	6,840	---	2,400	---	---	1
TOTAL	67	53	32	52,598	36,866	1,545	38,411	1,415	3,490	19,890	48	42
<b>DISTRICT VI</b>												
Riverside	1	1	1	600	600	---	600	---	600	---	1	1
San Bdo.	2	1	1	285	165	---	165	165	---	---	1	1
San Diego	16	8	8	2,986	1,711	22	1,733	605	---	663	11	7
TOTAL	19	10	10	3,871	2,476	22	2,498	770	600	663	13	9
GRAND TOTAL	750	617	401	246,545	181,710	9,103	190,813	13,081	45,464	53,032	476	405

### Range Improvement Stand-by Crews

The Range Improvement Stand-by Crews were first authorized by the Legislature and activated in 1949. By 1952 the stand-by crew authorization was adjusted to permit assignment of one crew in each of the six Division of Forestry Administrative Districts. By assigning one such crew to each District we have been able to give better stand-by service than formerly since much travel between districts has been eliminated.

A summary of the work of these crews is in Tables 3 and 4.

Table 3. Range Improvement Stand-by Services, 1952.

Activity	R.I. Crews	Suppression Crews	Combined Crew Activity
Number of Permittees	248	223	405
Number of Controlled Burns	147	151	248
Acreage: of Controlled Burns	99,077	74,386	136,559
of Escape	<u>3,824</u>	<u>2,073</u>	<u>4,491</u>
Total Serviced	102,901	76,459	141,050
Number of Wild Fires Attended	19		
Mileage: on Controlled Burns	12,927		
on Wild Fires	2,534		
between stations	<u>8,393</u>		
Total	23,854		

Note: More than one stand-by crew was furnished on some burns.

Table 4. Man-hour Distribution, Range Improvement Stand-by Crews, 1952.

Activity	Man-hours 1951 4 Crews	Man-hours 1952 6 Crews
Controlled burns	4,544	10,460
Travel time	2,506	1,145
Wildfire suppression	1,961	2,425
Training	329	3,021
Equipment Maintenance	942	1,693
Range Improvement studies	876	712
Fire Prevention & hazard reduction	---	692
Misc. work between controlled burns	---	6,159
Totals	11,158	26,307

<u>Stand-by Services</u>		
Regular fire suppression crews	9,367	6,010
Total crews stand-by service	13,911	16,470

Stand-by service from Range Improvement crews more than doubled during 1952. This is the result of greater availability and distribution of crews and an accelerated program. The 6,159 man hours used on various work projects indicate availability of stand-by service earlier in the season if ranchers can move burning projects forward--possibly with more mechanical mashing and spring burning. In many areas this year a large number of controlled burns at the same time prevented full stand-by service from either Range Improvement crews or regular fire control crews.

#### Fire Suppression Crew Stand-by

The Division is authorized to use regular fire suppression crews for control burn stand-by when the forest fire situation permits. In previous years the major portion of stand-by services was provided by this type of crew. This year, however, stand-by service was provided about equally by both types of crews. A summary of Fire Suppression Crew stand-by activity is presented in Table 3.

#### Reseeding

Reseeding was planned on 53,032 acres of the area controlled burned this year, which represents 27.8% of the total area. This is an increase of approximately 5% over the area reseeded in 1951.

Apparently there is a renewed interest in seeding lands where controlled burns were completed. Favorable precipitation over much of the state during the past two seasons has been an important factor; in addition, reseeded has been encouraged by Range Improvement Committees, Farm Advisors, and other interested parties.

In several localities ranchers are forming pools to purchase seed and sow the areas they are treating. Cost of seed is running about \$3.00 to \$3.50 per acre. Seeding by plane ranges from about \$1.00 per acre for small areas (200 acres or less) down to \$.25 per acre for those of 500-1000 acres or larger. Benefit payments by the PMA generally are set at eighty per cent of the cost of the seed.

#### Controlled Burn Escapes

Some important data on escapes are summarized in Table 5. There were 9,103 acres burned by escape. This is 4.8 percent of the area controlled burned, a much lower figure than in any previous year since the program started. Although the number of escapes--57--was the same as 1951, average size of controlled burn escapes decreased from 345 acres to 160 acres (Table 5). This shows that more attention was given to escapes and they were brought under control more quickly. A number of factors are concerned in bringing about this reduction in escape area. The permittee generally has developed and improved his skill, organization and techniques; the Division has learned and applied much in its administration of the program; the weather was a factor. All these combined favorably to hold the escape acreage at a low figure. There were also significant reductions in escapes in terms of percent of permittees and number of controlled burns.

Table 5. Summary of Range Improvement Controlled Burn Escapes, 1945-1952, Inclusive.

Year	Area Burned by Escapes			Number of Escapes	Percent of	
	Acres	Percent of Total	Average Size		Permittees	Burns
1945	15,232	23.2	---	--	--	--
1946	9,320	14.6	321	29	13.7	*
1947	6,106	13.5	305	20	11.8	*
1948	6,786	21.6	261	26	16.9	*
1949	14,628	14.3	270	54	15.7	*
1950	14,125	14.5	415	34	10.1	13.2
1951	19,653	12.8	345	57	13.0	19.9
1952	9,103	4.8	160	57	9.2	14.2
Totals & Averages	94,953	12.8	343	277	11.0	16.6

\*The number of permittees and number of burns was nearly the same for these years; exact data not available.

#### Range Improvement Committees

Range Improvement Committees of interested ranchers have been organized for a number of years in some parts of the State. Their activity has continued undiminished during this season. Their influence has been especially important in the southern San Joaquin Valley.

In addition to these established groups, Range Improvement Committees have been organized on either a community or County basis in a number of areas. Their first season of activity was in 1952. Work of these newer groups has been especially evident in San Luis Obispo, Shasta, Tuolumne, and Mariposa Counties.

These Committees have been of great assistance to the Division of Forestry in facilitating administration of the Range Improvement Program in areas where they are activated, as well as benefitting their members.

Trends and Developments of the Range Improvement Program

This year continued a trend that started in 1949. The number of burns and acreage burned are larger than last year, as it has been each year since 1948. However, the average size of the permit burn has decreased slightly from last year (Fig. 3). Nearly 75 percent of controlled burns were smaller than 400 acres. The following table summarizes the size distribution of the 1952 controlled burns.

Table 6. Variations in size of permit burns, 1952.

Size (Acres)	Number of Burns	Cumulative Number	Per Cent	Cumulative Per Cent
0 - 39	86	86	21.5	21.5
40 - 79	62	148	15.5	37.0
80 - 119	44	192	11.0	48.0
120 - 159	19	211	4.7	52.7
160 - 199	20	231	5.0	57.7
200 - 239	26	257	6.5	64.2
240 - 279	14	271	3.5	67.7
280 - 319	15	286	3.8	71.5
320 - 359	11	297	2.8	74.3
360 - 399	1	298	.2	74.5
400 - 499	17	315	4.3	78.8
500 - 599	12	327	3.0	81.8
600 - 699	11	338	2.7	84.5
700 - 799	6	344	1.5	86.0
800 - 899	9	353	2.2	88.2
900 - 999	2	355	.5	88.7
1000 - 1999	22	377	5.5	94.2
2000 - 2999	13	390	3.2	97.4
3000 - 3999	3	393	.7	98.1
4000 - 4999	3	396	.7	98.8
5000 plus	5	401	1.2	100.0
Totals	401		100.0	

Acreage reseeded has shown a considerable rise in absolute figures and some rise in percentage. These trends are illustrated in Figures 1 through 4.

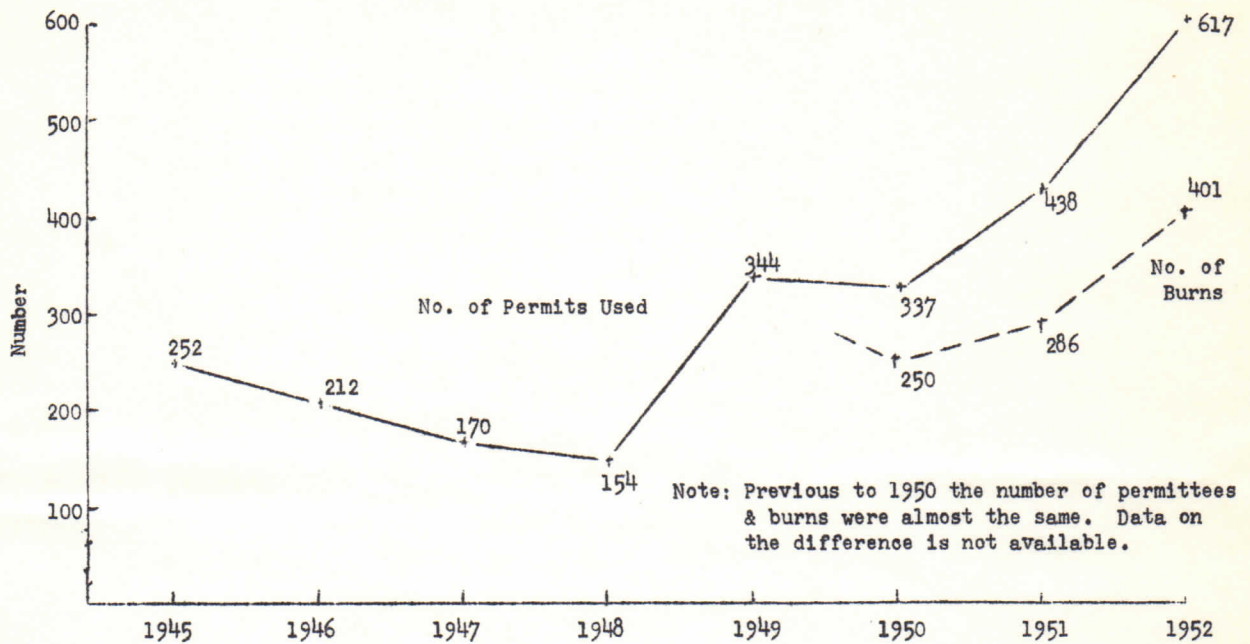


Figure 1. Number of Burns and Permits Used

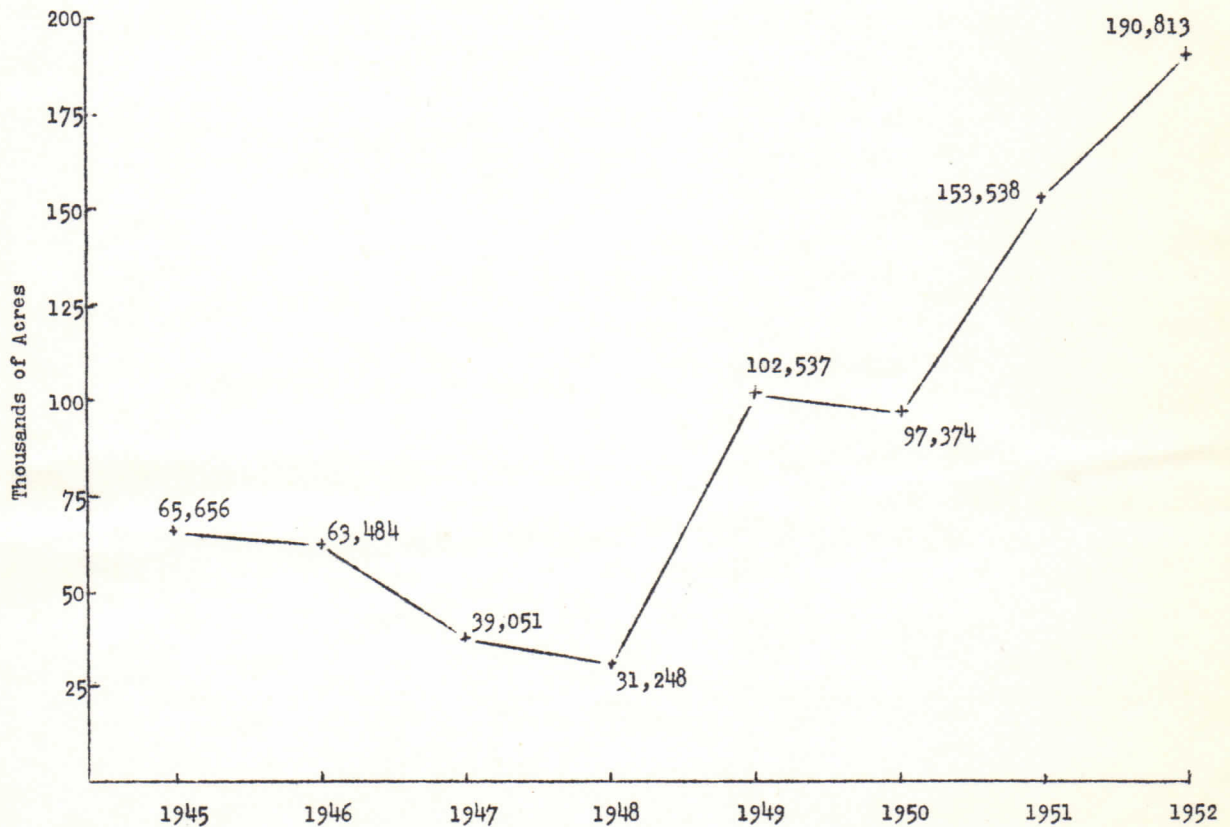


Figure 2. Total Area Burned

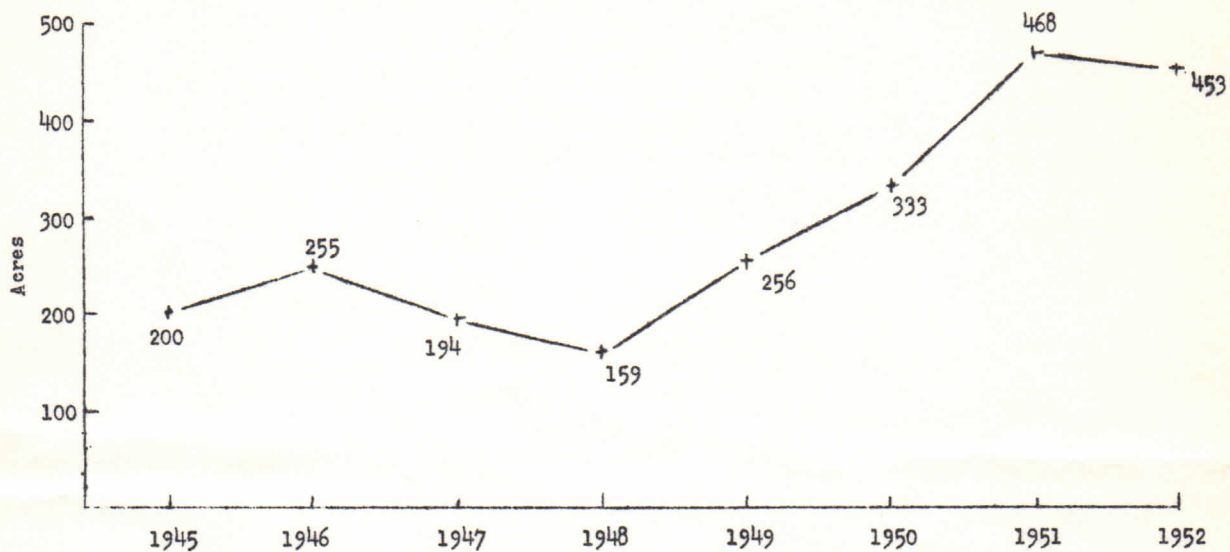


Figure 3. Average Size of Permit Burn

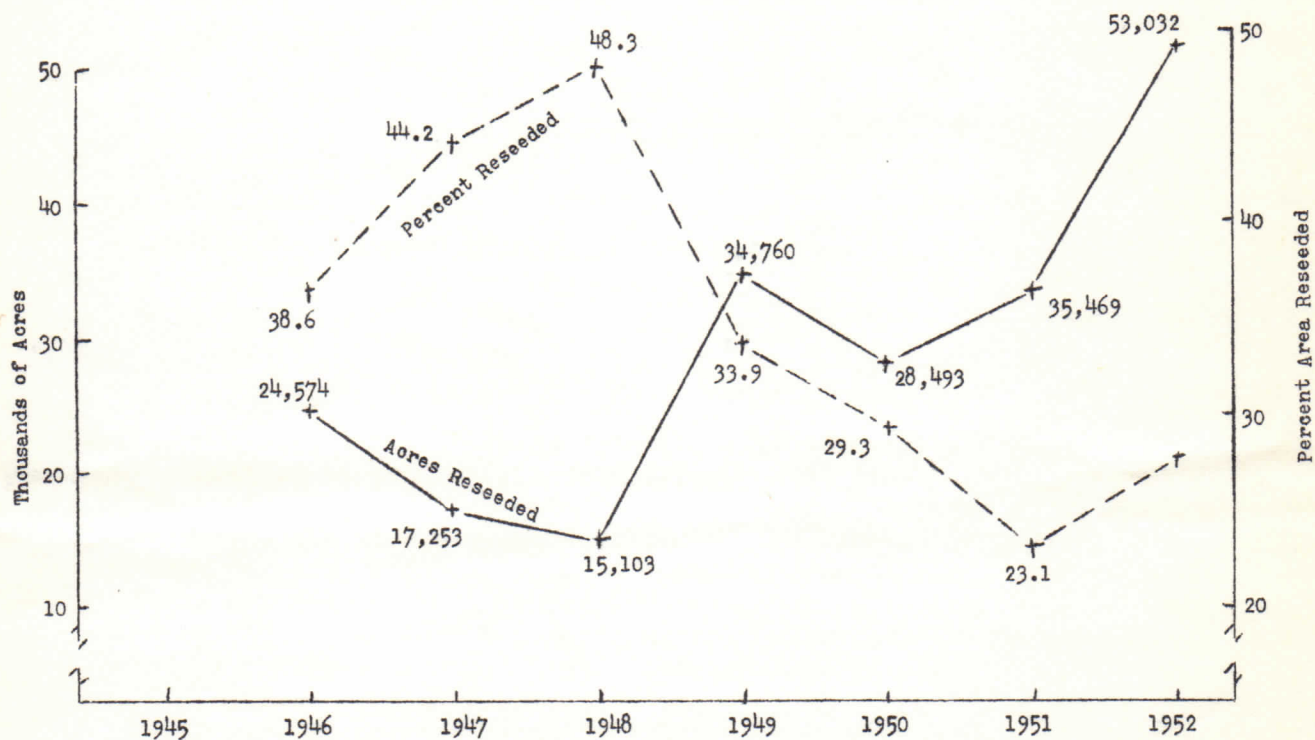


Figure 4. Reseeding of Controlled Burns

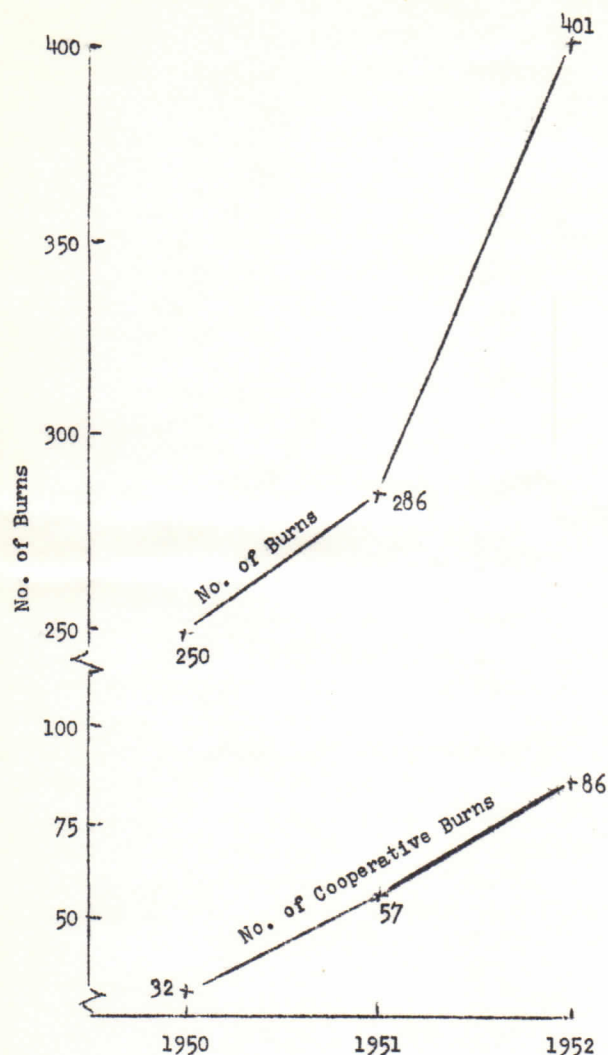


Figure 5. Cooperative Activity

The number of cooperative burns and number of permittees in the cooperative burns has increased again this year. Table 7 gives the data on these burns for the past three years and Fig. 5 illustrates the trend.

Table 7. Number of Cooperative Controlled Burns, 1950-52.

Year	Number of Cooperative Burns	Number of Permittees
1950	32	119
1951	57	209
1952	86	315

Cooperative burns are those in which ranchers with adjacent areas cooperate and execute a controlled burn jointly. This brings about considerable savings in line construction costs and often results in a better burn. Topography seldom follows property lines and can have a great effect upon the success of a burn. The cooperative burn helps to assure adequate manpower and equipment, thus promoting safety. There are also burns in which ranchers cooperate with their labor and equipment even though the entire burn is on one ownership. These are also cooperative burns though no special statistics are kept on them.

Area firing, the technique in which strips are mashed through the brush and fired as rapidly as possible, was used over a considerable area in 1952. The exact acreage on which it was employed was not determined. This firing technique has much promise of extending the period when controlled burning can be done on areas where bulldozers can operate. When the technique is successfully applied, area firing results in an intense fire that gives a very clean burn.

Groups other than the private landowner continue to have an interest in the program. These various groups do not have identical interest so it is not surprising that at various points conflicts in management objectives have arisen. Some conflicts have arisen from the effects of control burn smoke and hazard upon the surrounding countryside. Others have come from differences between recreation and grazing activities upon public lands. Stock watering dams (a part of proper range use distribution management) have conflicted with down stream water use. It is noteworthy that attitudes toward range management and improvement have reached a point of maturity where such conflicts can be settled amicably by both sides.

## FIELD STUDIES IN RANGE IMPROVEMENT

The Division of Forestry has been conducting a program of field studies in Range Improvement, pursuant to instructions of the Legislature. As we are not primarily a research agency, we carry on these studies in cooperation with other agencies.

The primary objective of these studies is to provide a local area where recent developments in land clearing, reseeding, and management can be put into practice in field scale trials. Such projects enable technicians of the Division of Forestry and other interested agencies to determine what can be done in a given locality. They afford local ranchers an opportunity to compare these projects with their own ranches which are located nearby and enable them to judge whether such treatments may be applied advantageously to their own problems. Ranchers have shown great interest in these projects and watch them closely. We have direct evidence of a number of cases where these studies have been the decisive factor in ranchers applying the same or similar practices to their own lands.

In the north coast our field studies have been directed toward developing a method for controlling invasions of the weedy medusa-head grass and to chemical treatment for opening up stands of dense hardwoods. A report on medusa-head control, indicating good possibility of reducing these stands by controlled burning, was given at the board meeting in 1952 and was published in the California Cattleman in June. A more comprehensive report has been prepared and will be published in the Journal of Forestry in the near future.

In northern California our field studies are concentrated on development of area firing, chemical sprays, reseeding and use of fertilizers in range improvement.

We have some preliminary results on yield of forage following clearing and reseeding in both the central Mother Lode Area and in San Benito County. During 1951, clipped plots on the Rescue Range, in El Dorado County, indicated an average yield of 1.5 animal unit months per acre; during 1952 this area was grazed by steers, yielding approximately 2.1 animal unit months per acre. The Spring Dell Range Area, in San Benito County, yielded an average of 1.04 acres per animal unit month when grazed in 1951; this area was not grazed in 1952, but clipped plots indicated a higher yield of forage this season. It must be kept firmly in mind, however, that these high yields are temporary and that production will level off at a much lower figure. The Spring Dell Range Study is a cooperative project

between the Division of Forestry and the Agricultural Extension Service; a progress report summarizing this work up to June, 1952 was issued during the summer.

In the southern San Joaquin Valley our attention has been centered on application of the area firing techniques for removing brush cover. Two studies have been started in cooperation with interested ranchers. Preliminary results were as good or better than expected. Plans have been made to develop methods of employing the area firing technique to winter burning of suitable stands of brush.

#### SUMMARY

Range Improvement is coming to be considered as a routine ranch operation ". . . another job to do, like building fence." Attention still is being centered mainly on controlled burning as a means of brush removal, but there is no lagging of interest in mechanical clearing on lands where this method is practicable. An excellent job of fire-line preparation is being done, and adequate manpower and equipment are being provided for fire control.

There is a marked trend toward additional preparation beyond fire-line construction, in order to insure an effective burn. This preparation involves considerable employment of equipment for crushing brush, falling trees, and application of area ignition techniques.

The most significant advance is in the control of escapes, with respect to both proportion of total area and number of controlled burns, since initiation of the present Range Improvement Program was made during 1952. Ranchers are demonstrating the fact that they can keep their controlled burns within the intended limits.

Reseeding and management phases of range improvement are receiving an increasing share of attention.

Ranchers are making an increasing number of requests for services of our Range Technicians. They are coordinating their activities closely with personnel of other public agencies, to insure a minimum of duplicated effort.

The Division of Forestry field studies in Range Improvement are serving an important function in developing information which ranchers can apply in the same locality and have stimulated much interest and action in Range Improvement. Approximately 250 interested persons visited the Rescue Range Study in El Dorado County during 1952.