

ACTIVITY IN RANGE IMPROVEMENT

ANNUAL REPORT — 1961



**MEDUSA-HEAD
(ELYMUS CAPUT-MEDUSAE)**

State of California
The Resources Agency
Department of Conservation
Division of Forestry

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Cover Photo

Medusa-head--common on many of California's range lands--is now reported growing in Fresno County. Many ranchers are using fire to control this very undesirable annual grass.

California Division of Forestry
Sacramento

March, 1962

ACTIVITY IN RANGE IMPROVEMENT

Annual Report - 1961

The Range Improvement activity of the California Division of Forestry was authorized by the State Legislature in 1945. Sections 4880-4883 of the Public Resources Code authorized issuance of permits for controlled burning of brush covered land in areas where it is the responsibility of the state to maintain a forest fire protection system under jurisdiction of the Division of Forestry and directed that these permits be administered by the Division. Under Sections 4861-4866 and 4871-4878 of the Public Resources Code the Division of Forestry is given the authority to engage in a program of experimental land clearance and revegetation on lands suitable for range use within the area of the Division's fire control responsibility.

Controlled Burning Operations

The action phase of the range improvement program consists primarily of the range improvement projects of ranchers, where land is cleared by controlled burning under permits administered by the Division of Forestry. Private individuals and groups carry out controlled burning projects and related range improvement activities on lands under their ownership or legal control. The Division of Forestry administers the permits for controlled burning for protection of the public interest. Areas proposed for burning are inspected, advisory service is provided, precautions to be taken during the burning are suggested and the burning permit is issued by the Division. The Division provides available stand-by crews for protection of adjacent property during burning but it is not authorized to do the actual controlled burning for the rancher.

Controlled Burning Statistics

During 1961 the Division of Forestry received 445 applications for permits to control burn a total of 177,331 acres of land throughout the state. Permits were issued to 331 individuals who completed 239 controlled burns (fig. 1). Of these burns, 48 were cooperative projects involving more than one rancher.

During the year 88,398 acres of brush covered land were cleared by fire under permit (fig. 2). An additional 2,982 acres were burned by fire that escaped control. During 1961 there were 32,272 acres burned for the second or third time in an effort to control brush

sprouts (fig. 2). Thus during the current year 56,126 acres of brush covered land were burned for the first time in the hope of making it more productive economically.

A summary of the activity in controlled burning for range improvement since 1945 is presented in table 1; details of the activity taking place in various counties and Division of Forestry administrative districts for 1961 are given in table 2.

Records show that about 74.4 per cent of the persons who applied for permits completed their burns, and that they burned 48.2 per cent of the acreage planned.

The activity during 1961 was low compared to previous years due to severe weather conditions prevalent in many portions of the state.

Seeding

Ranchers seeded 29,519 acres in 1961, as compared to 35,006 acres seeded during the year before (fig. 3). The San Joaquin District showed the highest rate of seeding--65 per cent of the area controlled burned in that district.

Most species used in seeding were available at prices comparable to 1960. Rose clover and smilo were reported unavailable in some areas. Prices reported for some of the commonly used species were:

	<u>Price/lb.</u>
Annual ryegrass	7-10¢
Blando brome	68-80¢
Bur clover	32-35¢
Lana vetch	25¢
Orchard grass	36-40¢
Perennial ryegrass	9-16¢
Subterranean clover	35-42¢
Timothy	24¢
Rose clover	95¢
Harding grass	70-95¢
Tall wheatgrass	47-60¢
Wimmera ryegrass	8- 9¢
Pubescent wheatgrass	98¢

Aerial seeding, the most common method, cost about fifty cents per acre on the average. This cost varied from twenty-five cents to one dollar per acre depending on location, acreage involved, and rate of application.

Trends in Controlled Burns

Controlled burns averaged about 357 acres in size in 1961, somewhat smaller than in 1960 (fig. 4). Approximately 69 per cent of the burns completed were smaller than the average size (table 3).

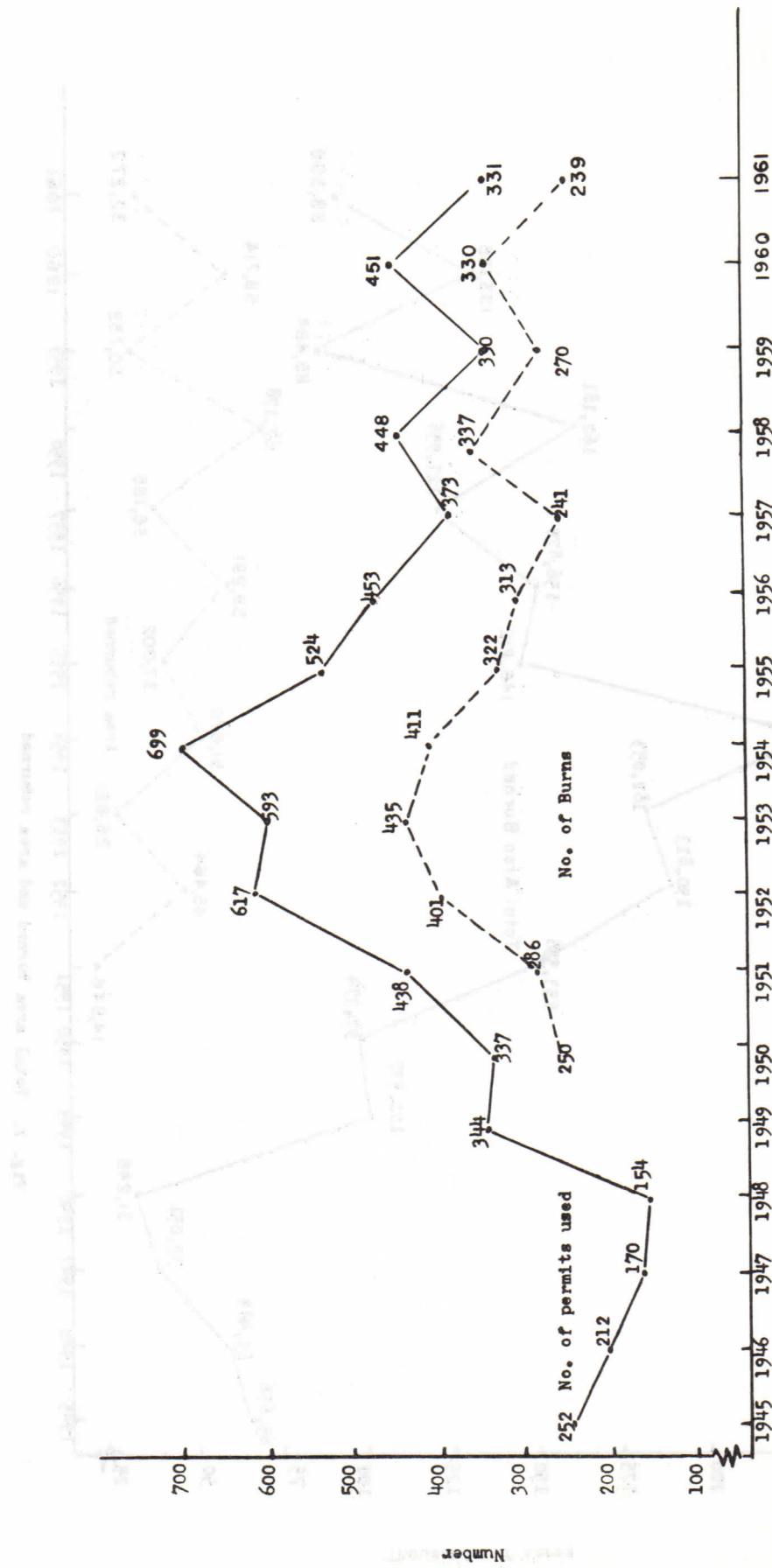


Fig. 1 Number of Permits Used and Number of Burns

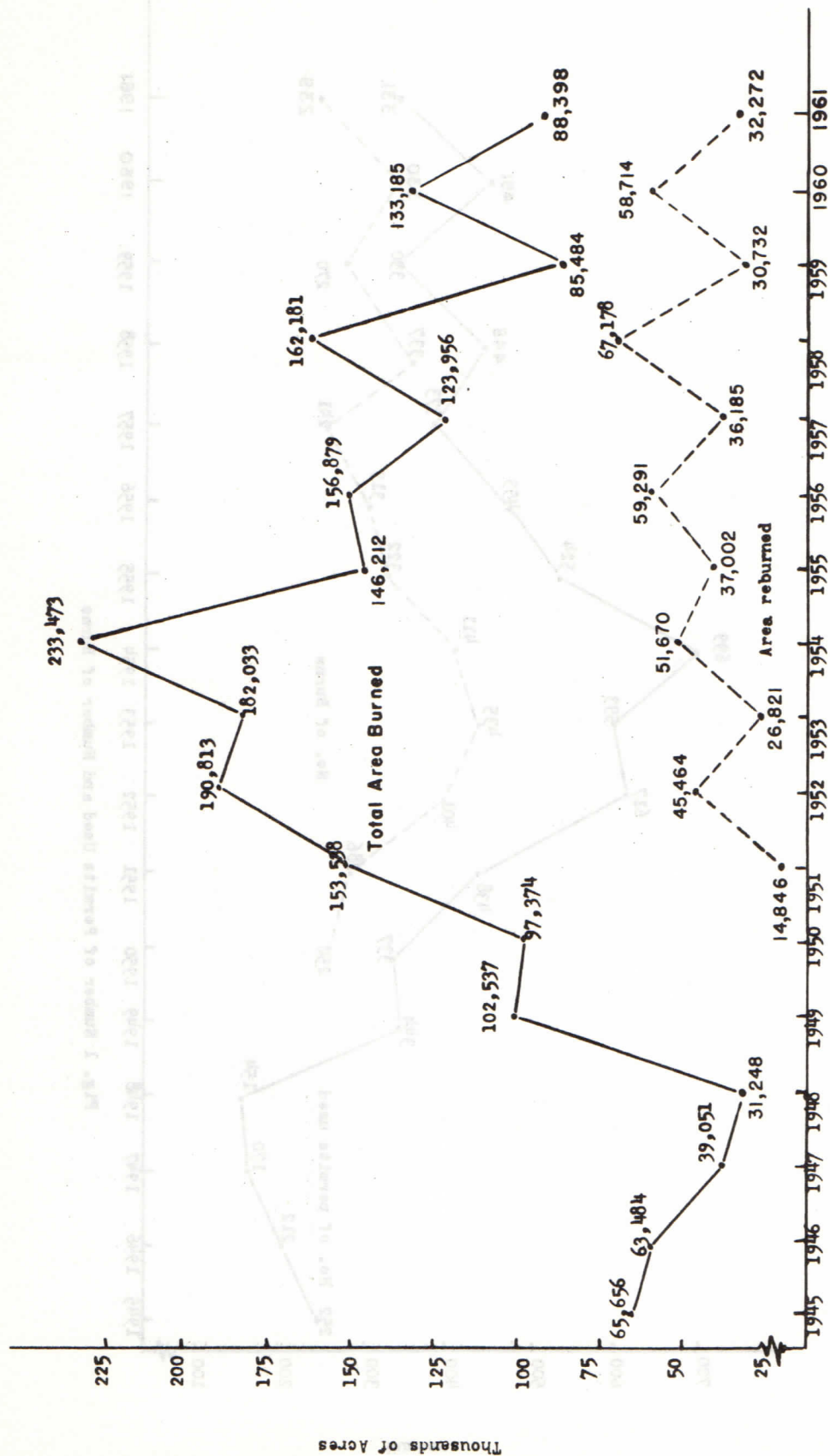


Fig. 2. Total area burned and area returned

Table 1. Summary of activity in controlled burning and reseeding for Range Improvement, 1945-1961, inclusive.

Year	No. of appl's	No. of permits used	Acres burned under permit	Acres burned by escape	Total acres burned	Less acres re-burned	Net acreage burned	Acres seeded	Per cent seeded	Av. size permit burn
1945	*	252	50,424	15,232	65,656	*	*	*	*	200
1946	266	212	54,164	9,320	63,484	*	*	24,574	38.7	255
1947	216	170	32,945	6,106	39,051	*	*	17,253	44.2	194
1948	180	154	24,462	6,786	31,248	*	*	15,103	48.3	159
1949	408	344	87,909	14,628	102,537	*	*	34,760	33.9	256
1950	469	337	83,249	14,125	97,374	*	*	28,493	29.3	333
1951	558	438	133,885	19,653	153,538	14,847	138,691	35,469	23.1	468
1952	750	617	181,710	9,103	190,813	45,464	145,349	53,032	27.8	453
1953	819	593	178,354	3,679	182,033	26,821	155,212	65,855	36.2	410
1954	980	699	227,131	6,342	233,473	51,670	181,803	69,232	29.7	552
1955	750	524	134,370	11,842	146,212	37,002	109,210	38,327	23.3	417
1956	620	453	149,043	7,836	156,879	59,291	97,588	53,106	29.5	476
1957	507	373	109,731	14,225	123,956	36,185	87,771	39,019	31.5	451
1958	571	448	150,564	11,617	162,181	67,178	95,003	42,981	24.6	447
1959	443	330	83,079	2,405	85,484	30,732	54,752	28,069	32.8	308
1960	523	451	128,430	4,755	133,185	58,714	74,471	35,006	26.3	389
1961	445	331	85,416	2,982	88,398	32,272	56,126	29,519	28.9	357
TOTALS	8,505	6,726	1,894,866	160,636	2,055,502	460,176	1,595,326	609,798	—	—

* Data not available for these years.

Table 2. Summary of Controlled Burn Statistics, 1961.

County	No. of appl.	No. of permits used	No. of burns	Acres appl'd for	Acres burned under permit	Excess acres burned	Total acres burned	Acres treated mech'ly & burned	Acres re-burned	Acres seeded	Stand-by re-quested	Stand-by used
DISTRICT I												
Humboldt	36	36	30	9,735	8,462	1	8,463	200	5,600	2,547	2	3
Lake	26	25	18	15,522	2,420	0	2,420	180	322	542	3	6
Mendocino	156	121	82	43,095	21,766	487	22,253	217	8,316	5,135	52	24
Napa	6	6	5	7,760	2,945	940	3,885	80	300	80	1	1
Sonoma	26	23	15	7,547	2,241	0	2,241	0	632	1,590	5	4
Yolo	8	6	6	12,347	2,963	290	3,253	150	590	1,150	2	0
Total	258	217	156	96,006	40,797	1,718	42,515	827	15,760	11,044	65	38
DISTRICT II												
Butte	1	1	1	100	300	0	300	0	0	0	0	0
Lassen	1	1	1	40	40	0	40	0	0	0	1	1
Modoc	1	1	1	1,300	100	0	100	0	0	0	1	1
Shasta	19	7	6	5,071	2,011	6	2,017	732	1,744	1,417	17	4
Siskiyou	3	2	2	1,120	630	0	630	6	80	0	3	2
Tehama	16	11	12	9,420	6,340	0	6,340	4,515	770	380	18	13
Total	41	23	23	17,051	9,421	6	9,427	5,253	2,594	1,797	40	21
DISTRICT III												
Calaveras	3	3	3	270	270	0	270	240	130	100	3	3
El Dorado	4	4	4	450	450	0	450	311	100	240	2	2
Nevada	15	7	5	2,090	1,145	0	1,145	121	845	10	10	6
Tuolumne	18	7	5	4,705	1,670	0	1,670	300	1,120	350	9	7
Total	40	21	17	7,515	3,535	0	3,535	972	2,195	700	24	18
DISTRICT IV												
Fresno	24	19	8	8,393	5,358	0	5,358	1,315	778	3,208	21	19
Madera	19	7	2	8,145	5,140	0	5,140	1,370	2,700	3,280	17	7
Mariposa	2	2	2	800	800	30	830	340	160	200	2	2
Tulare	3	3	3	2,750	2,300	0	2,300	879	1,330	2,110	2	2
Total	48	31	15	20,088	13,598	30	13,628	3,904	4,968	8,798	42	30
DISTRICT V												
Alameda	2	2	2	58	38	0	38	0	35	0	2	2
Monterey	3	2	2	760	430	1,168	1,598	130	0	730	3	2
San Benito	9	4	2	8,030	1,300	45	1,345	0	670	400	9	4
S.L. Obispo	15	14	8	6,203	5,108	0	5,108	358	2,920	2,760	15	14
S. Barbara	11	11	8	7,760	7,760	0	7,760	0	2,970	3,250	11	11
S. Clara	4	2	2	1,100	305	0	305	22	0	40	1	2
Stanislaus	9	2	2	8,200	2,960	0	2,960	100	0	0	5	1
Total	53	37	26	32,111	17,901	1,213	19,114	610	6,595	7,180	46	36
DISTRICT VI												
San Diego	5	2	2	4,560	164	15	179	0	160	0	3	2
Total	5	2	2	4,560	164	15	179	0	160	0	3	2
STATE TOTAL	445	331	239	177,331	85,416	2,982	88,398	11,566	32,272	29,519	220	145

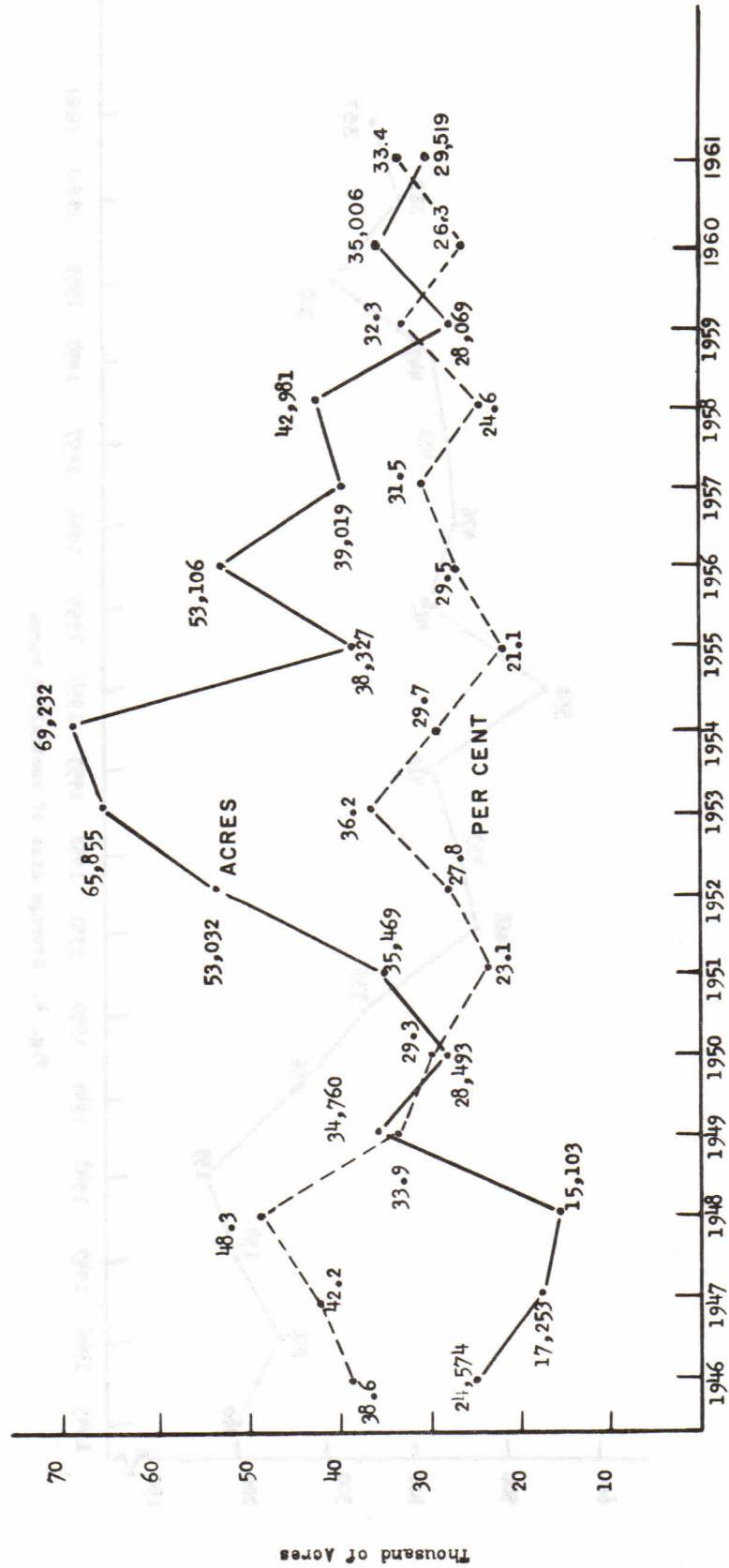


Fig. 3. Reseeding of controlled burns

Fig. 3. Harvesting of controlled burns.

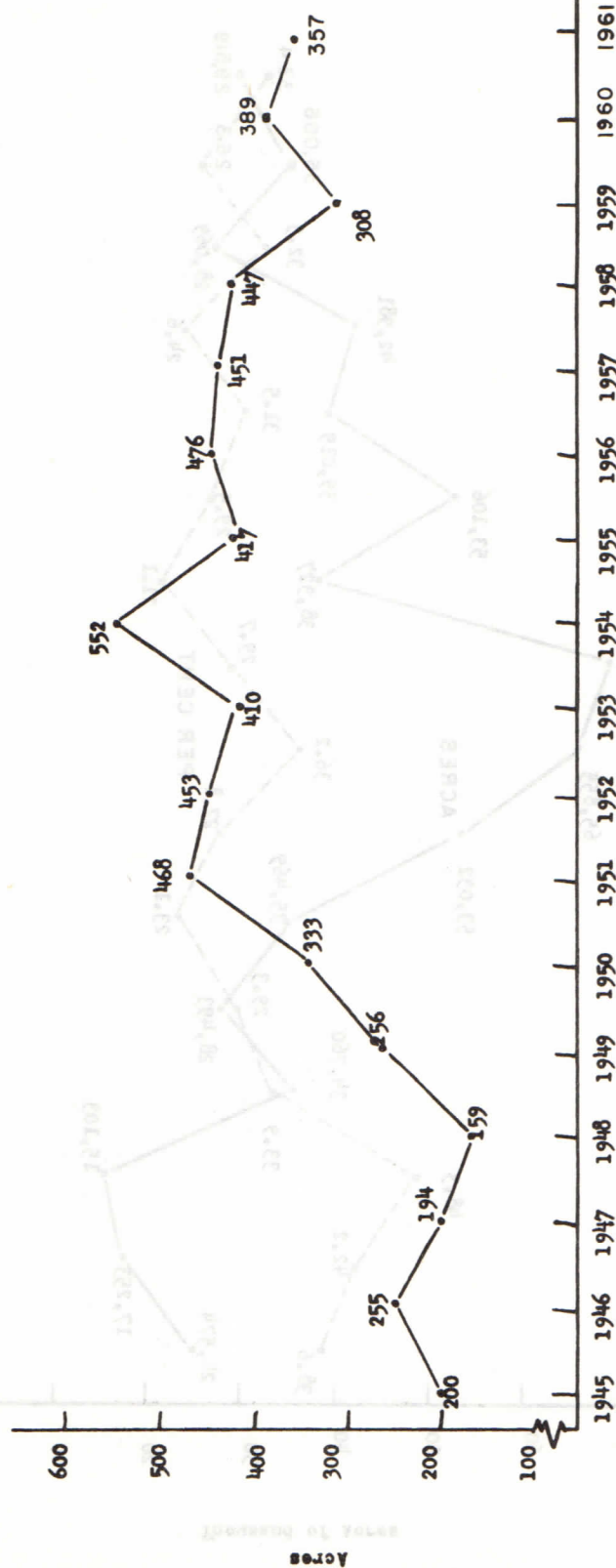


Fig. 4. Average size of controlled burns

Twenty-two of the controlled burns were 1,000 acres or larger and nine were in excess of 2,000 acres. These large burns accounted for over 40 per cent of the total acreage burned under permit.

Approximately 52 per cent of the burns were below 200 acres in size. In general the percentage of burns in this size class (less than 200 acres) conforms with the pattern of previous years. The largest burn in 1961 was less than 3,000 acres.

Table 3. Variations in size of controlled burns, 1961.

Size (acres)	Number of burns	Cumulative number	Per cent	Cumulative per cent
0 - 39	46	46	19.3	19.3
40 - 79	26	72	10.9	30.2
80 - 119	26	98	10.9	41.1
120 - 159	17	115	7.1	48.2
160 - 199	9	124	3.8	52.0
200 - 239	14	138	5.9	57.9
240 - 279	8	146	3.4	61.3
280 - 319	12	158	5.0	66.3
320 - 359	7	165	2.9	69.2
360 - 399	8	173	3.3	72.5
400 - 499	12	185	5.0	77.5
500 - 599	11	196	4.6	82.1
600 - 699	10	206	4.2	86.3
700 - 799	2	208	0.8	87.1
800 - 899	7	215	2.9	90.0
900 - 999	2	217	0.8	90.8
1,000 - 1,999	13	230	5.4	96.2
2,000 - 2,999	9	239	3.8	100.0
Totals	239		100.0	

Stand-by Fire Protection

Section 4880 of the Public Resources Code empowers the California Division of Forestry to provide special stand-by fire crews when available, for added fire protection during controlled burns. The purpose of these crews is to safeguard adjacent property that might be exposed to danger from the controlled burn. Five of the Division's six administrative districts, where the major portion of burning takes place, are each assigned such a crew.

During 1961 these special crews were made available during 57 brush clearing projects.

Since more than one burn may be scheduled for the same day within a district, it is not always possible for the special crew to be in the vicinity. However, whether or not the stand-by crew is available, regular fire control stations in the vicinity are maintained on a "ready-alert" basis during the course of the burn. During 1961 regular Division fire control forces were on a special alert on 82 controlled burns.

The combined activity of both regular fire suppression forces and special range improvement crews provided added protection on 111 range improvement projects (table 4). Stand-by crews provided protection during the burning of 55,867 acres. This is 63 per cent of the total area burned during the year.

Table 4. Range Improvement crew activity, 1961.

Activity	R. I. crews	Suppression crews on special alert	Combined crew activity*
Number of permittees	76	107	148
No. of controlled burns	57	82	111
Acreage: of controlled burns	37,235	38,673	55,598
of escapes	209	233	269
total	37,444	38,906	55,867

*More than one stand-by crew was used on some burns so this column does not equal the sum of the two preceding columns.

Range Improvement Advisory Service

The Range Improvement advisory service carried out by the Division of Forestry began in 1945 with the employment of one man who confined his activities primarily to the North Coast area. By 1961 the Division's range work load had so increased that the range advisory service required a specialist on the staff of each of the six District Deputies. During the year these men attended more than 64 range improvement meetings and worked with more than 368 ranchers helping to solve their controlled burning, grazing management, or other problems of brush range improvement (fig. 5). In addition, the range specialists train and advise the Division of Forestry's administrative and fire control personnel on range management and related phases of land use.

The range specialists also provide the technical direction for the Division's numerous test plots and major range study projects.



Fig. 5. Division of Forestry range specialists assisted many ranchers and other landowners in controlling undesirable vegetation during 1961.

RANGE IMPROVEMENT FIELD STUDIES

In accordance with the legislative directive to the Division of Forestry contained in Chapters 7.5 and 8, Public Resources Code, a program of brush range field studies has become an important part of the Division's range improvement activity. These studies, as directed by law, are established to seek and then demonstrate the regional answer to many of the state's brush range problems. The Division has found it desirable to locate these studies in various brush range areas throughout the state, since many answers apply only to local areas. The State of California is so variable in respect to climate and geography that solutions to problems found in one locality may not apply elsewhere.

Cooperation has been a guiding principle of these studies. They are conducted with the assistance of landowners and interested public agencies. Study areas are generally leased without charge to the state by the cooperating landowners. Participation of the other agencies eliminates duplication of effort, and pools resources of cooperators for the mutual advantage of all the participants.

ACTIVITY REPORTS

The following district reports briefly summarize local trends and activities in range improvement (fig. 6). Also included are

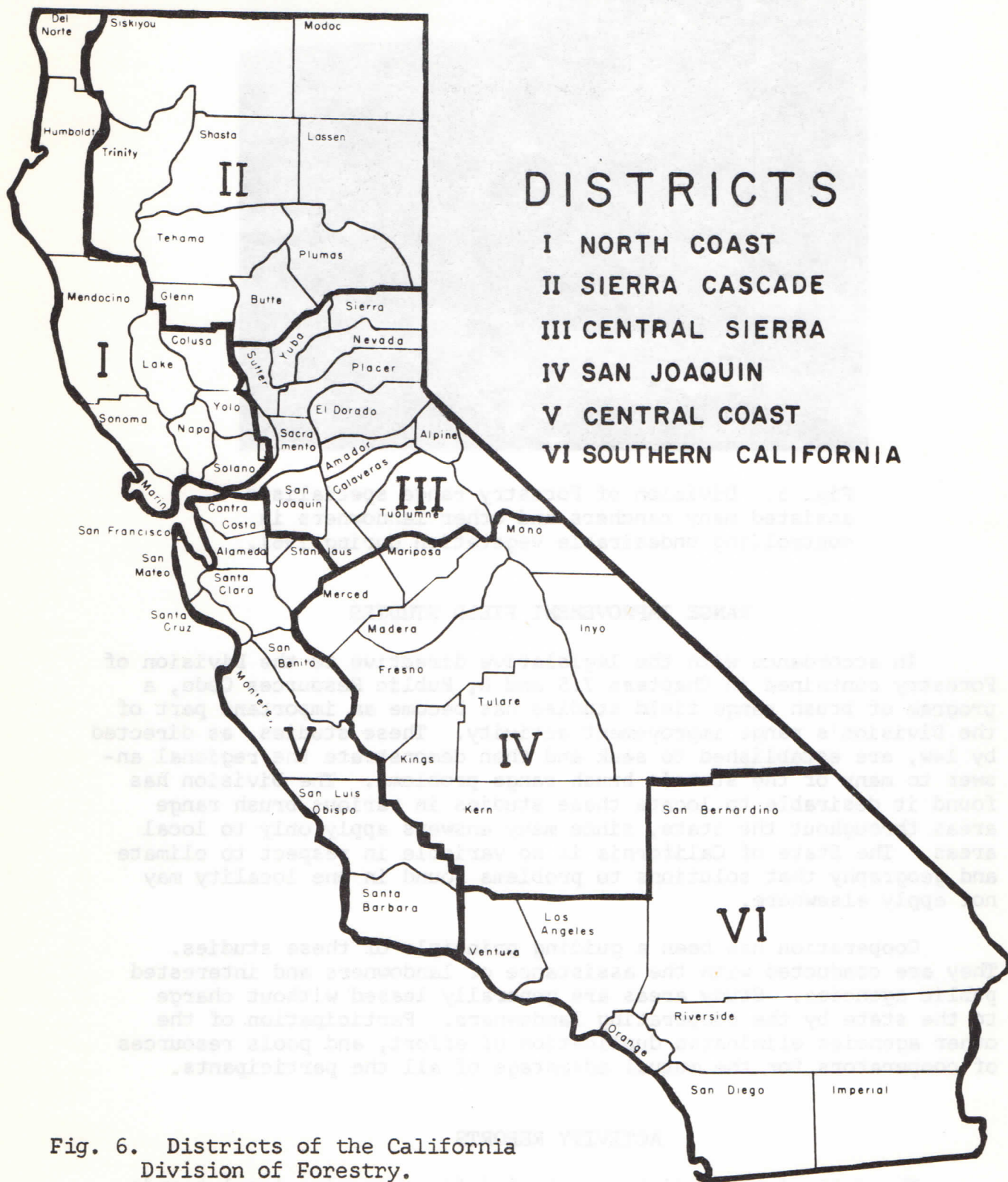


Fig. 6. Districts of the California Division of Forestry.

progress reports of range study projects being carried out directly by the California Division of Forestry or in cooperation with others. More detailed information is available in specific project reports.

North Coast District

Normal Year

One notable exception to an otherwise normal year was the area burned by escapes--1,718 acres--only 47 per cent of the ten year average. The 156 applications processed in Mendocino County is a new high. Many burns were canceled due to extremely dry conditions in the late summer.

Reseeding

The 11,044 acres reseeded by 53 ranchers compares favorably with previous years. Aircraft seeding was the most common method of application; some 2,000 acres were seeded by hand. Nearly all the ranchers received assistance from the federal Agricultural Conservation Program for seeding.

General

There were 25 burns conducted exclusively for game habitat improvement. Fourteen burns were conducted for medusa-head (Elymus caput-medusae) control (see cover).

The Humboldt County Range Improvement Association was very active during the year and conducted a field trip to local medusa-head and Klamath weed problem areas. Division personnel attended and offered advice on medusa-head control.

Cascade Range Project

Activity at the Cascade Range Study in Sonoma County included measuring of forage production by both grazing and clipping and controlling undesirable plants with herbicides. The first progress report was issued late in 1961.

Sierra Cascade District

Trends

The trend toward smaller burns continued through 1961 but the trend toward more burns was off primarily due to the severity of the fire season.

The total acreage burned by escapes--6 acres--was the lowest of any year since the initiation of the program.

The area reseeded (19 per cent) was the lowest since 1955.

The trend toward mechanical preparation continued high at 56 per cent of the acreage burned. Nearly all of the permittees received reimbursement for this treatment through the Agricultural Conservation Program. The majority of this treatment was in Tehama County and involved pushing over undesirable hardwoods with a bulldozer.

Pettyjohn Project

This demonstration plot was established in 1960 in Tehama County. The object of the cooperative project is to demonstrate and investigate the use of fire, machinery and chemicals in the control of chamise. The value of seeding certain selected species of forage plants on converted chamise sites in this area is being studied.

Activities during 1961 varied from brush mashing and herbicide treatments to seeding and fertilizing. A portion of the project was fenced to exclude rabbits and deer (fig. 7).

Central Sierra District

Trends

The downward trend in both numbers of burns and acreage established earlier continued through 1961. Extremely hazardous summer weather had a strong effect on the continuance of this downward trend.

Mechanical preparation and the reseeding of areas treated for the first time continues at a very high level. About 72 per cent of the areas burned for the first time were prepared mechanically. Over 50 per cent of the areas treated for the first time were reseeded.

The size of controlled burns in this district continues well below the state average with 75 per cent of the burns under 150 acres. However, this may indicate more intensive treatment, which would assure better results.

Costs

The price of seed for range improvement remained unchanged from 1960 as did the prices for the aerial application of seed and herbicides. Fixed wing aircraft seeding cost approximately \$0.50 per acre for areas of 1,000 to 3,000 acres.

Helicopter application of herbicides on brush land was about \$2.50 per acre and fixed wing about \$1.50 per acre. These costs vary somewhat with the size of the area, rate of application and accessibility.

Rabbit Flat Field Study

Activity at the Rabbit Flat Study in Amador County during



Fig. 7. A portion of the Pettyjohn demonstration plot was enclosed with a deer tight fence. Note the large number of chamise seedlings in the enclosed area.

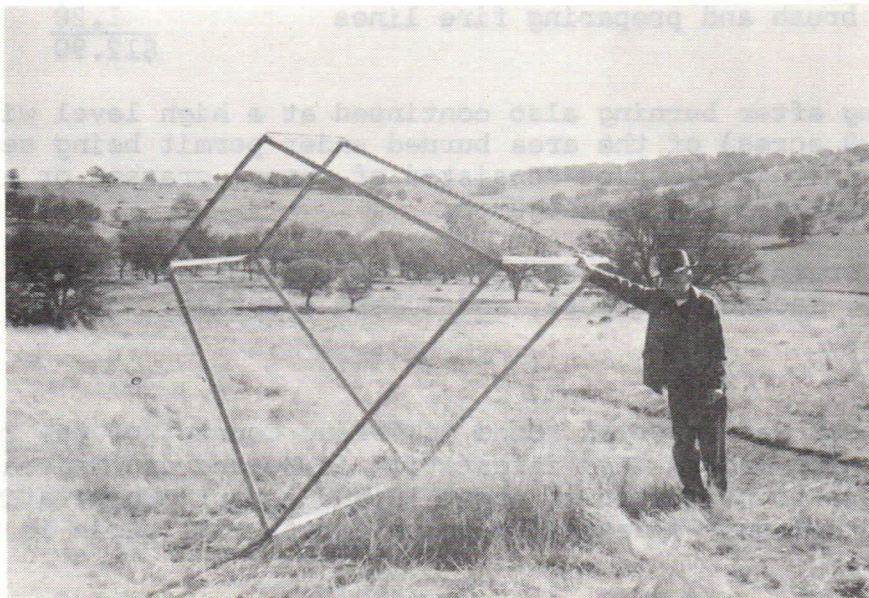


Fig. 8. This light, portable livestock exclosure was specifically designed for the Rabbit Flat study in Amador County. Exclosures like the one pictured are used to evaluate forage production.

1961 included field trips, evaluation of different methods of controlling undesirable oak trees, and measurements of the change in both quality and quantity of the forage (fig. 8).

Observations made during 1961 indicate that cattle prefer to graze the "frill" treated areas and open areas as opposed to the untreated areas. Clippings made during 1961 indicate that the treated areas produced over 35 per cent more forage (also of a higher quality) than the untreated areas.

San Joaquin District

Trends

The trend toward mechanical preparation continues with nearly 50 per cent of the permittees mechanically crushing the brush before burning.

One Madera County rancher, in preparing for a 1961 controlled burn, reported the following cost on a 1,000 acre basis.

	<u>Cost/acre</u>
"Cut surface" treatment on Digger pines	\$.50
Killing live oak trees (falling and treating stumps with 2,4-D amine)	11.20
Mashing brush and preparing fire lines	1.20
	<u>\$12.90</u>

Reseeding after burning also continued at a high level with 65 per cent (8,798 acres) of the area burned under permit being seeded. Most seedings in this district consisted of annual grasses or a mixture of annual grasses and legumes.

Rancher organizations participated in controlled burning activities in Fresno, Madera, Mariposa, and Tulare counties.

Medusa-head

Medusa-head was reported found in Fresno County for the first time in 1961. The medusa-head infestation in Merced and Madera counties appears to be static at about 18,500 acres. Cooperative efforts to control this undesirable annual grass will begin in the spring of 1962.

North Fork Project

The North Fork Project in Madera County was operated on a maintenance basis to obtain data on vegetation changes and grazing capacity. Other activities during the year included fence maintenance, follow-up shrub control, and tours.

Central Coast District

Trends

The number of controlled burns conducted in 1961 was up 12 per cent over 1960. The average size burn dropped from 1,353 acres to 735 acres in 1961.

The acreage mechanically treated--610 acres--changed but little from 1960. One rancher successfully treated standing brush with herbicides before burning.

Many of the 7,180 acres seeded in this district were sowed with perennial grasses.

Cooperation

Rancher organizations continue to be quite active - all controlled burns in San Luis Obispo and Santa Barbara counties were scheduled and conducted by range improvement associations. Follow-up treatment on these burns continues at a high level.

Ranchita Range Study

Chemical control of brush sprouts and seedlings by helicopter highlighted 1961 activities at the Ranchita Range Study near San Luis Obispo. Other activities included fencing, seeding, constructing erosion check dams, and the installation of pipe for the stock water system.

First grazing of this area will take place in 1962.

Southern California District

Trends

Controlled burning activity continued at a low level in Southern California with all the activity concentrated in San Diego County.

Nearly 900 acres of brush were cleared for range improvement by mechanical means in San Diego County. Although most of this clearing was with bulldozers, brush disks and specials cutters were also used. Costs varied from three to fifteen dollars per acre for mechanical clearing.

