

Control Burning for Deer Management in Chaparral in California

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It is with a great deal of satisfaction and pleasure that I am here representing the Lake-Mendocino Counties Sportsmans Council today to inform you about our use of fire as an instrument to manage chaparral type vegetation for better wildlife use. It is also a great satisfaction to become acquainted with a research station that shares our views about the wise use of fire to maintain a proper balance between plant and animal life.

Our primary interest in the use of fire has been to improve the natural habitat to produce the maximum amount of feed for the maximum numbers of wildlife.

First, I would like to give some pertinent facts about California and how fire fits into its ecology. I think it could safely be said that all of California burned many times before the arrival of the white man.

California has 100 million acres and is a state of many contrasting environments. We have an unusual rainfall distribution because we normally have a prolonged period between about May 15th to October 15th of little or no rainfall. Our rainfall averages from less than 2 inches per year in some parts of the state to over 100 inches

per year in other parts. The State of California is about 1,000 miles long from north to south with two prominent mountain ranges running most of this length. The Pacific Ocean also runs along one side the full length of the state and has several modifying effects on climate.

The elevation ranges from 220 feet below sea level to over 14,000 feet above, with very different plant and animal life occurring at different altitudes. The largest single type of environment found in California is the chaparral areas, covered with several different brush species and found at elevations ranging from sea level to 4,000 feet. There are probably over 20 million acres of chaparral in California located in both the coast range of mountains and the Sierras. Interspersed with the chaparral at lower elevations are considerable acreages of oak woodlands understoried by grass. There are large timber stands of both Douglas fir and ponderosa pine at elevations usually above 3,000 feet; probably over 10 million acres in all. There is also a large sagebrush plateau area covering most of the northeast corner of the state and a large desert area in southern California. Finally, there are about 2 million acres of redwood forest located in a narrow band along the north coast and in the Sequoia redwoods of the Sierras.

All of these areas show evidence of fire as a major ecological factor in earlier years and should fit into a controlled burning program for various reasons. However, my presentation will be limited to the chaparral of the north coast range of mountains.

Another important factor influencing control burning in California is the fact that 45 percent of the state is federally owned by the Bureau of Land Management (B.L.M.) and the United States Forest Service (U.S.F.S.). Most of the acreage owned by these agencies is chaparral, woodland and timber. The B.L.M. has a contract with the California Division of Forest Service (C.D.F.) to do all of the fire suppression on their lands. Unfortunately, all of these agencies are oriented toward fire exclusion rather than toward control burning on any appreciable scale.

The basic diet for deer in the chaparral is browse. When the brush is not burned at periodic intervals, it reaches a decadent condition where most of the new shoots are above the reach of the deer.



FIG. 3. Decadent, unburned chamise appears at upper left. Note grass in a 2-year burn in the foreground.

Researchers from the University of California have found that an old decadent brush field only produces about 50 pounds of available feed per acre at a protein content of about 1 percent. However, after burning, the same area will produce over 2 thousand pounds of available feed at around 6 percent protein content. Simple arithmetic shows that this is about 240 times the nutrient value per acre.

This basic diet of browse is supplemented by acorns in the fall and early winter and supplemented by grass in the late winter and spring. The grass dries up in June due to our long summer drought, so the amount of available browse determines the actual carrying capacity of a given range.

The chaparral type vegetation is made up of fire adapted species which have probably burned periodically for several million years and like a rose or berry vine when it is pruned or "cool burned," it

generates much new growth. This new growth, following fire, is what the deer needs for feed and about 80 percent of the different species are utilized by them.

The policies of our public agencies which attempt to suppress or exclude all fires, unfortunately result in too large an accumulation of fuel and when the inevitable wildfire breaks out, it is not a "cool fire" but a holocaust. This hot fire often kills many brush plants because the resprouting crown root is burned right into the ground. This often causes an increase of erosion not found with a control burn fire. There also seems to be evidence that this excessive heat is detrimental to dormant plant seeds.

PROBLEM AND PLAN

The area I would like to discuss today is located west of Scotts Valley in Lake County, California in the Coast Range about 100 miles north of San Francisco. This block of fine chaparral deer range was kept burned regularly up through the early 1930's by local ranchers and sportsmen, and as a result supported a large healthy deer herd.

In the late 1930's and early 1940's, the California State Division of Forestry established such rigid regulations against this type of burning that the ranchers and sportsmen ceased burning.

As a consequence, the brush began to grow up to a decadent condition which supplied less and less feed for this large deer herd. Many starved to death and large numbers of deer migrated down to the valley floor and invaded the farmers' croplands. By 1950 there were hundreds of deer in the orchards and fields every night and it became nearly impossible to raise a young pear tree due to deer damage. At the same time, ranchers and hunters going into the hills noted fewer and fewer deer in their natural habitat. They were mostly located along the brush areas adjoining the valley floor during the daylight hours.

The ranchers, sportsmen and members of the Department of Fish and Game discussed ways and means of solving this very serious crop depredation problem. The Department of Fish and Game wanted a doe and fawn shoot, but the ranchers and sportsmen re-

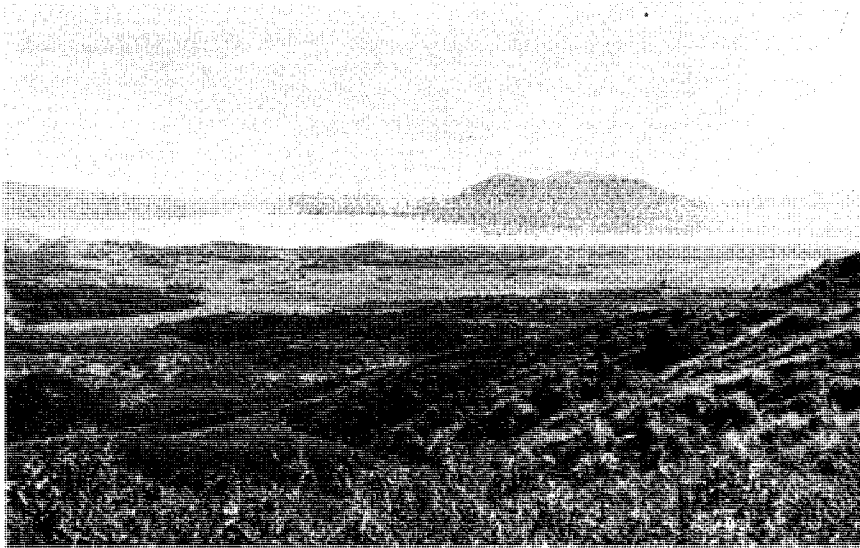


FIG. 4. Scotts Valley, Lake County, California.

jected this because it was felt that the does and fawns would be needed to restock the hills with deer if they could be moved back into their natural habitat.

Normally the deer had been moving back into the hills a couple of miles during the winter and spring when there were acorns and grass available. However, they would come back down to the valley in early summer when the grass dried up.

ACTUAL SOLUTION OF PROBLEM

In early 1955, the farmers and sportsmen laid plans for solving the problem through a combined program of a deer fence along the valley edge coupled with a control burning program in the chaparral covered hills to provide feed for the deer. The Scotts Valley Deer Fence Association was formed and the members assessed themselves \$10.00 per acre to construct a 7-mile deer fence and do the control burning.

Plans were made for a long range burning program beginning June of 1955. The first year a long strip ranging from $\frac{1}{8}$ to $\frac{1}{4}$ mile wide and about 6 miles long paralleling the valley, was burned. This gave a protection break behind all the buildings for working future burns as well as needed feed for the deer herd. Most of this burning was on private lands and fortunately we were able to obtain a cooperative permit by having all the property owners authorize the association to perform burning on their lands. Three different days when conditions were favorable were needed to accomplish this. About 25 ranchers with spray rigs, back pumps, orchard heater lighters and weed burners turned out. In addition the Soil Conservation Service D-7 dozer was on a standby basis and the local fire district pumpers were on standing notice.

The next year in October, strips were burned from the back of this original main strip up to it to provide feed further in the hills and to further break up possibility of large escape fires. About 800 acres were burned with fewer men and equipment on a standby basis only. Three different days of burning were needed. Permits were again on a cooperative basis.

Burns were planned for the fall of 1957 but the rains were so early and persistent that year that the plan was postponed until 1958.

When we tried to obtain our permits in 1958, we encountered our first difficulties with the public agencies because we were now working off of private lands and were getting out to the B.L.M. lands. The former state forester who had been very cooperative had been transferred and replaced by a very uncooperative forester. Fortunately for us we found that the area we wanted to burn had been withdrawn from B.L.M. management by an old Act of Congress for a recreation area and turned over to the Lake County Board of Supervisors. The supervisors were very cooperative and obtained the permits for us and we burned 1,400 acres in September and October of 1958.

Our plan for 1959 was to move farther north and open up another 1,000 acres. However, the large Cow Mountain wildfire swept in through the area we had planned to work on, so no burns were put in at this time. This wildfire covered about 12,000 acres of brush land and didn't go out until it burned into our control burned

areas of previous years. It was then easily suppressed because of lack of fuel. This large wildfire did much damage to our deer herd in the long run because it destroyed one of the factors necessary in a good deer range, namely, cover for the deer to hide in.

An ideal deer range has burned areas for new browse, interspersed with areas of older brush for cover for the deer, wooded areas with grass openings and, of course, water is also needed. When this wildfire swept through the area it burned everything clean and left no cover for fawn survival against predators, particularly coyotes. We have noted a large coyote buildup in this area with an accompanying large loss of the fawn crop each year and an overall decline in deer numbers.

In November 1960, we dropped back into an area that was previously passed up and put a burn of about 400 acres in size, in an area that had become grown past its usefulness. We had ideal burning conditions, a fair northeast wind on an east hill side. This fire resulted in about a 30 percent burn—numerous strips with good cover on each side—yet completely fireproofed the area. Two months after the burn, in January 1961, new growth average on liveoak was 6 inches, chamise growth averaged 2 inches. Many deer, all in excellent condition were observed in this area.

During the winter months of 1961 and 1962 when burning permits were not needed, farmers and hunters put many strip burns into the north part of the area to supplement deer feed and create fire breaks. These burns were made mostly in chamise (which burns very readily in the winter months) along south slopes and ridge tops. These burns amounted to approximately 300 to 400 acres in all.

By 1963 we felt that the range was in excellent shape and we could let a few years go by without any burning.

We decided to start reburning some areas last fall (1967), but when we tried to get permits we encountered real problems with the governmental agencies involved. First the State Division of Forestry would no longer issue cooperative permits on private land but wanted each individual land owner to obtain a separate permit. This involves a tremendous amount of red tape. Secondly, the B.L.M. notified the Lake County Supervisors that they no longer had control of the recreation area, even though the original Act of

Congress is still on the books. Thus, we have to deal with the B.L.M. to get permits on public land.

Finally these permits have clauses in them that we oppose. The B.L.M. has embarked on a program of spraying the resprouts on all wildfires and control burns with 2,4,5-T brush killer and then reseeding with grass seed. In the first place, we do not want these fire adapted species of brush killed because resprouting brush provided the backbone of the deer's diet. Secondly, most of the grasses being planted do not survive our annual summer drought and are replaced by the annual grasses that normally appear following a burn anyway.

The real stinker in the permit is that we have to agree to pay for half of the cost of this spraying and grass reseeding that we disapprove of or we can't get a permit. Unless some way is found around this road block, it appears that we are about out of business.

This spraying of brush to kill it appears to us to be as serious an interference with the natural ecology of fire as the total suppression philosophy which has for so long disrupted nature's ecology.

The results have been as nearly a 100 percent success as possible. By 1956, very few deer were coming down to the valley around the deer fence and only a handful has come down since. We have seen quite an increase back in the hills where they belong. However, what first looked like a big herd when congregated on a few hundred acres on the valley floor, did not look so big when scattered out over several thousand acres in the hills, and to this date there is still far more feed in the area than the deer need.

As for wildfires in the area, there have been only two or three minor fires in the southern area where the first burns have grown up to some extent. These were easily suppressed however, by state forestry. The only appreciable erosion, that we have noticed, has been where equipment was used to disturb the soil, making fire trails, etc.

Our group has been primarily interested in maintaining the brush species for deer feed. However, others in California have been interested in eliminating a portion of the brush and converting it to grass. This can be done simply by reburning at more frequent intervals than we do for deer range. We normally reburn about every 10 or 12 years while the livestock man would reburn every

3 or 4 years for a while and much of the brush will be killed out.

Having mentioned the faults of too large a burn, I think it also important to mention the problem of putting in only a few small burns in a large decadent brush field. The deer will badly overbrowse the more desirable species in these small burns and the less desirable species will overstory and eventually crowd out the more desirable species. The end result is another type of range deterioration.

Another advantage we found to control burning in the chaparral was the improvement to the watershed. After the brush was burned a marked increase in water flow from springs and streams was noted. The University of California has several reports on this in print. The native grasses and forbs which appeared between the resprouting brush after a burn also reduced the amount of erosion due to their fibrous root systems.

All of these factors makes one wonder why the governmental agencies involved have not embarked on a large control burning program. It has been suggested by Dr. Muller (Botanist, University of California at Santa Barbara) that, "Protection of chaparral vegetation against fire is presumably practiced in the belief that such protection is somehow beneficial to watershed cover and that fire is destructive. I submit that precisely the opposite is the case. If the chaparral is protected from fire for as long as 40 years, certain shrub species begin apparently to die of old age. Thus regular and predictable degeneration of the chaparral under conditions of fire protection constitutes proof that fire is a natural and necessary condition of the life for chaparral."

A committee of ranchers and sportsmen met in 1960 for several hours on one Saturday a month for 9 months with representatives of all the governmental agencies concerned with land management in California. The purposes of the meetings were to study conditions of the forests and brushlands of California and to make conclusions and recommendations which might result in a statewide control burning program. The result was a very comprehensive plan for the state, including recommendations to all agencies and suggested legislation needed. This set of recommendations have been presented widely throughout California. The recommendations have

gained the support and endorsement of the following organizations, all sportsmens clubs of California, the California Farm Bureau, the California Cattlemen's Association, the California Wool Growers Association, the United Republicans of California and the State Association of County Supervisors. The recommendations have been vigorously opposed by the California Division of Forestry and the United States Forest Service. The Department of Fish and Game and the Bureau of Land Management have not given the recommendations any support.

In passing, I might say that the Game Management Branch of the California Department of Fish and Game has a "harvest first" concept of deer management which advocates killing off does and fawns to match the poor range brought on by fire exclusion. The sportsmen and ranchers disagree with this concept, believing that with the adoption of a statewide control burning program, these deer are needed for breeding stock to build the herds up to match the increasing carrying capacity produced by burning.

In spite of all the statewide support for these recommendations, there is still no real progress evident in breaking through the resistance to control burning by the U. S. Forest Service and the California Division of Forestry.

It seems a sad commentary that when so great a potential exists and the need is so large by those with the inherent right to range improvement by control burning that our public servants should have such a closed mind on the subject.

CONCLUSIONS

We have had some outstanding Californians advocating the wise use of fire during the past 50 years, but they have been largely ignored by the agencies. Such men as Albert Clapp, Fred Ellenwood, Merle Apperton, John O'Neal, Ralph Renner and Dr. Harold Biswell, to name a few, have all spoken and written on the subject.

My family has been in Lake County since 1854 and practiced control burning for many years. In my lifetime, I have seen millions of acres grow up to become an outdoor kindling pile under the fire exclusion policies of the agencies. Sooner or later a wildfire breaks

out and we have had quite a number in the 100,000 acre category.

In the process of carrying through this program of burning over 4,000 acres, we feel that we have learned quite a little about the problems of control burning in California. Following is a summary of some of these findings.

STUDY, CLASSIFICATION AND PLANNING OF AREAS

1. Land should be classified as to how many total acres in an area are suitable for control burning.
2. A long range plan should be set up establishing the number of acres to be burned each year.
3. A primary fire line should be planned to be established first. Usually along the top of a main N-S ridge if possible.
4. Determine where the main danger to property, timber and buildings might occur and fireproof these areas first.
5. Determine which areas to burn first year, second year, and so on; also how much each year.
6. Classify the burns as to what time of year and under what burning conditions different areas should be burned.
7. Determine where and how to light different areas.
8. Plan number of men and what equipment is needed for each burn.
9. Determine how much advance preparation must be done for each burn.
10. Lay out secondary lines from your primary line for each burn including a study of natural terrain features which can be used.

It is felt that items 1 and 2 above, should be done on a statewide planning basis.

COST ASPECT

1. It took about 150 man days to burn over 4,000 acres, or labor worth about 50 cents per acre. Actually, this was all voluntary labor.
2. By planning and selection of the proper conditions, lighting at proper places at proper time of day, burning towards burned

firebreaks and using prevailing wind, no bulldozer work was done, although an old established fire trail was along our primary ridge fire break. This reduced equipment cost to a few cents per acre for gasoline, for tractors and spray rigs the first year while establishing the primary line. There have been only two small escapes, one of which burned itself out on about 200 acres and the other was suppressed by a backfire from the road by the local Fire District, after it had crawled through grass in one of our two-year-old burns. If costs for horses, jeeps, spray rigs and tractors were figured on a rental basis, it is estimated that 15 cents per acre would cover it.

3. Incidental costs, such as oil, gasoline, planning, matches, etc., would probably not exceed 5 cents per acre.
4. Ideal deer range could be made up of many 5-10 acre burns scattered through an entire area. However, this is not feasible because of the excessive cost due to the fact that excessive mechanical preparation must be done or the burning must all be done under the poorest burning conditions in order to keep the size this small.
5. At the other extreme, would be one large burn done all in one block. This would not be desirable for many reasons, although it would be the cheapest.
6. We feel the practical approach is to plan intermediate size burns of from 100 to 200 acres, because although not ideal, they provide a satisfactory range at a moderate cost with only a moderate amount of preparation.

OBSERVATION OF EFFECT ON SOIL, WATER AND BRUSH

1. We have noted an increase in stream flow in summer.
2. Many springs appear that were formerly dry.
3. We have not noted any appreciable increase in erosion except where heavy equipment was used to suppress fires.
4. We do not feel that soil fertility has been reduced.
5. Most brush showed sprouts in a few weeks.
6. The grass growth was observed to be far better than before burning.

OBSERVATIONS OF DEER HERD

1. Deer have left croplands and returned to the hills.
2. Deer numbers have increased.
3. Deer are in far better condition than when down on cropland.
4. There is more feed available than the deer can eat at present.

**SOME FACTORS WHICH DETERMINE HOW WELL
BRUSH WILL BURN**

1. Weather factor:
A—Temperature; B—Humidity; C—Days since last rain; D—Wind velocity; E—Wind Direction.
2. Season of year.
3. Time of day.
4. Terrain factors:
A—Steepness of slope; B—Direction of slope; C—Whether fire is lit to burn uphill or downhill; D—Near ridgetops or in canyons.
5. Type of fuel:
A—Species; B—Maturity; C—Density; D—Height; E—Whether crushed; F—How long since last burn; G—Grass.
6. Size of fire.
7. Lighting technique.

On the basis of which combination of the above factors are present, an index for burning for a given area at a given time could be established as follows:

- Index 1—Conditions where fire can't be controlled.
- Index 2—Good control burning conditions.
- Index 3—Fair to poor burning conditions.
- Index 4—Conditions where brush won't burn.

It is felt that a control burn under Index 1 should never be attempted. The larger main burns should be done under Index 2. The touchy danger spots should be done under Index 3. Firebreaks along ridge tops can be done under Index 3 to reduce the amount of dozer work. Trying to burn under Index 4 is a waste of time and money.

SUMMARY

Both the California Division of Forestry and the U. S. Forest Services are constantly striving for improved techniques of fire suppression. Both agencies are placing emphasis on fire prevention. We believe these two activities both to be important, however, we feel that control burning as a means of fire prevention should be given equal status. Basically, improvements in fire suppression techniques and fire prevention must eventually result in an accumulation of more fuel if not accompanied by a control burning program.

It doesn't seem logical to expect to be able to completely prevent and suppress *all* wildfires, particularly as the kindling pile grows. Thus, as time goes on with improved techniques of suppression, we find fewer large fires, but when one does break loose it will be tremendous and do far more total damage than several smaller fires. In other words, prevention and improved techniques of fire suppression must be accompanied by a program of fuel removal by planned action in order to avoid an accumulation of more fire hazard. The most practical method of removal of this fuel is to burn it with a good control burning program.

You could not kindle a backlog in your fireplace with matches alone. You first obtain paper and kindling and place it by the backlog and then you can get it started burning with one match. Prevention of an accumulation of kindling under our timber and the removal of such an accumulation would eliminate much of the danger to our timber because it would then be very difficult to set a growing tree on fire without kindling to ignite it.

At the same time that this fireproofing is going on, game habitat would also be improved. When brush becomes decadent, it is not only a fire hazard but it provides very little browse for deer. They are browsers, not wood eaters. A good statewide control burning program will provide more feed for deer on millions of acres in California, at the same time the fire hazard is reduced. It also improves the habitat for quail, doves and rabbits.

When a brush field grows up solid, there is a marked decrease in water flow from springs and streams and many dry up in the summer which formerly ran the year around. We need our water here in California for far more important uses than supporting decadent

brush. Needless to say, the fishing in streams with little or no water is rather poor. A control burning program would return much of this wasted water to our use.

Many of our ranges could support many head of livestock where none are now grazed, due to a lack of feed. Again as with deer, livestock are not wood eaters. A good control burning program would result in a better range for livestock by providing browse, grass and water for the animals where in many cases they are now lacking.

Many millions of dollars are spent every year in fire suppression and we still have wildfires doing many more millions of dollars of damage every year. By breaking up the brush fields, providing fuel breaks, reducing the size of wildfires and making it easier to control wildfires, the members of the Northern Counties Wildlife Conservation Association believe that many millions of dollars each year could be saved in fire fighting costs with an accompanying reduction in damage done by wildfires.