

# Use of Fire in Land Clearing

careful management of controlled burn requires effective patrol and mop-up operations to achieve planned results

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**Whenever fire** is burning adjacent to a control line men and equipment must be on hand to keep it from jumping the line and becoming wildfire.

Crews charged with line holding responsibility should follow closely behind the firing crews and be alert to:

1. Discover and extinguish all spot fires across the control line.

2. Cool down with dirt or water all burning material next to the control line to prevent ignition of material across the line.

3. Check that part of the control line which is dug to mineral soil so fire can not creep across.

4. Burn cleanly all material near and inside the control line by firing unburned islands. Slowly burning material should be drawn together for complete burning.

Three general types of instructions should be given men who are charged with line holding:

1. Within the limits of safety and after firing crews have done their work, the fire should be allowed to burn as much and as rapidly as possible. Everything combustible immediately inside the line should be burned. Unless the fire is burning in such a way that it might cross the line or throw spot fires no attempt to put out the fire should be made.

2. Men—whose sole job is spot fire detection—should be stationed on vantage points outside the control line to watch continually for escapes or spot fires.

3. Each section of line should be guarded until immediate threat of fire crossing is gone. Time required for line holding after firing varies from a few minutes in grass to a matter of hours in down logs or in heavy brush. When the fire has burned inward—away from the line—and there is no active flame near it, line holding becomes unnecessary.

*The last of five articles reporting the findings in investigations in the effectiveness, the safety and the cost of the use of controlled burning as a tool for land clearing. No attempt is made to provide one formula for prescribed burning in California; each fire is an individual case to be planned on the ground.*

*Fire control actions connected with controlled burning aim to confine fire to the predetermined area. If this area approximates an ideal burn area with the characteristics listed below and is fired according to a plan which widens control lines as it burns, minimum fire control measures are required. The difficulty or ease of control varies directly with the fuel, location of the area, preparation of lines, the firing plan, and the weather at the time of burn.*

*There is no fire control problem if the following conditions can be satisfied:*

1. Fine, dry fuels adjacent to control lines.

2. Up slope into the burn from control lines.

3. Air movement into the burn from control lines.

4. A firing plan which provides that all control lines be fired so flame moves away from them and not toward them.

5. No human errors or carelessness on burn day.

*The fact remains that 11% to 17% of all range improvement controlled burns in California escape and become wildfires. In addition most controlled burns require considerable fire control effort because one or more of the above ideal characteristics does not occur.*

## Patrol

Patrolmen—provided with horses, jeeps, or other transportation—should be on the job before line holding crews leave.

Lack of continuous and complete patrol of control lines is one of the most

common and important sources of escape fires.

Usually the patrolmen are charged with these responsibilities:

1. Patrol of a definite section of the control line.

2. Detecting escapes and spot fires outside the control line, exercising particular care when wind is blowing away from the fire.

3. Continuous patrol until relieved or instructed by the fire boss that patrol is no longer necessary.

4. Alertness to prearranged signals in case help is needed.

5. Participation in extinguishing spot fires and other escapes only until sufficient help is available to control them—then to resume patrol.

6. Advice to the fire boss and mop-up men of particularly hazardous situations which should be corrected.

After continuous patrol is no longer necessary the area should be examined late each afternoon for several days to several weeks after the fire because there is always a possibility of a flare-up of smoldering material.

## Mop-up

Mop-up activities are designed to make a fire safe after line holding is discontinued and are complete only when fire is extinguished far enough inward from the control line so there is no reasonable possibility of an escape. This distance varies with fuel, wind and topography.

Mop-up men have the following duties:

1. Allow remaining fuel material to burn up whenever safety permits. Logs or other large material may be rolled together to get more rapid combustion.

2. Extinguish completely burning material which will not be consumed by fire within the time mop-up crews are available and which could cause later spotfires or other escapes.

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**Control lines can be made or widened cheaply if a bulldozer is walked over the line location to smash the burn down as next to the road in this picture. Dried, smashed brush can then be burned at times when adjacent standing brush will not carry fire.**

## FIRE

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3. Fall snags not cut during preparation of the area, particularly if they are burning.

4. Inspect unburned islands near the control line to see that no sparks or smouldering embers can ignite them at a later time. If it is safe to do so, the islands should be burned out.

5. Cover dangerous smouldering or burning material with dirt. Uncover and inspect such material to make sure the fire is completely out before leaving the area.

Mop-up work is hot, dirty work but every part of the control line—and the area from 20 to 100 yards inside the line—must be made safe before everyone leaves the fire.

A wise fire boss puts all men—who have completed their jobs of firing or line holding—to work at mopping-up. He tells them exactly what to do, shows them how to do it, then checks to see that it is done. A fire properly mopped-up does not break out later.

### Check List

A check list of things to be considered by a landowner—who contemplates the possibility of a controlled burn—and which summarizes the finding of the studies covered by this report is given below:

#### A. Planning and Preparation

1. Has the local fire control agency where permits can be obtained been consulted?

2. Are there local range improvement committees to be consulted?

3. Can all state and local laws be complied with?

4. Are there sufficient fine, dead fuels to carry fire effectively within the pre-selected area?

5. Can fire safely be controlled at proposed boundaries?

6. Is the cost of burning and subsequent treatment more or less than anticipated increased returns?

7. If other measures such as chemical spraying, disking, seeding, or reduced grazing are necessary to finally clear the area of undesired vegetation, can they be used?

#### B. Selection of Area

1. Is the actual burn the best natural burning unit in the area in question?

2. Have boundary lines been selected to best approximate ideal conditions?

3. Are existing barriers utilized to fullest extent?

4. Have extreme fuel hazards been eliminated?

5. Is it possible to do necessary control line construction at reasonable cost?

6. Is the area of a size that can be burned in one uniform burning period?

7. Are preparations adequate to obtain a permit?

#### C. Organization

1. Is an experienced fire boss available to take charge?

2. Can the date of the burn be changed if weather conditions are not right for a successful and safe burn?

3. Will sufficient manpower to control the fire be available on burn day?

4. Will a standby or other reserve force be available?

5. Will preliminary meetings be arranged to organize crews and instruct men?

6. Can food, fuel, equipment, tools and other supplies be furnished?

7. Can effective communications be arranged?

8. Is adequate transportation available?

#### D. Conducting the Burn

1. Is the fuel in a condition for easy ignition?

2. Is fuel modification desirable?

3. Have firing plans been made?

4. Can the firing schedule be met?

5. Are special ignition tools necessary?

6. Have probable hot spots on the control line been determined?

7. What weather conditions can be anticipated?

8. Can the fire be made safe in one day?

9. Can patrol for several days—or as long as necessary—be maintained after the fire?

These are the most important items on a check list of things which must be considered in the conduction of a controlled burn.

It is important in all cases that the landowner maintain close contact with the State Division of Forestry Ranger or other agency head charged with fire control.

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A new firing technique which produced a small, clean and safe burn under extremely poor burning conditions was tested on May 19. A bulldozer was used to smash brush down in strips, as shown above, two weeks before the fire. The brush field was a combination of chamise, ceanothus, and toyon berry at the height of its new spring growth, and standing brush was for all practical purposes fireproof. Instead of starting fire on one side or in one place, the entire area was fired simultaneously across its width by men walking along the strips. Radiation on standing brush between stripped rows came from all sides and was so intense that the area burned clean. Preliminary estimates indicate that similar areas can be prepared for \$1.00 to \$2.00 per acre. This simultaneous firing technique, which offers promise for winter and spring burns, its costs, results, and hazards, will be thoroughly investigated during the coming year.

Explanation of the diagram to the right:  
1. Routes of firing crews.  
2. Blocks of standing brush about twice the width of smashed line.  
3. Brush smashed down one bulldozer width.

