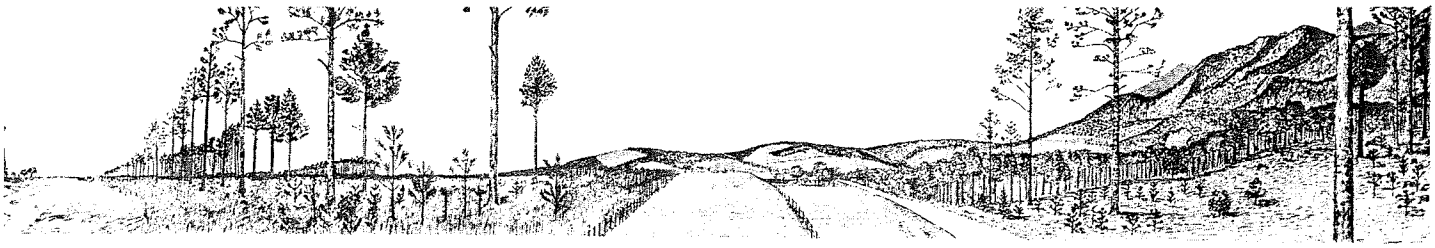

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PRELIMINARY GUIDELINES FOR USING SUPPRESSION FIRES TO CONTROL WILDFIRES IN THE SOUTHEAST

Abstract.—Suppression firing is defined as the application of fire to speed or strengthen control action on free-burning wildfires. The key to successful suppression firing is availability of personnel knowledgeable in specific application plus an adequate supply of manpower and equipment to contain the set fire. Preliminary guidelines for the use of this fire-control tool are presented for the technologist.

"Fighting fire with fire" is a well-founded axiom—but it is plagued with certain qualifications. Successful application requires knowledge of when, where, and how suppression firing is used. Defined as the intentional application of fire to speed or strengthen control action on free-burning wildfires, suppression firing includes the following classifications:

1. Counter firing.—Emergency firing in or near the projected path of a steady, high-intensity fire for the purpose of splitting or delaying the fire front, or to steer the fire in a desired direction.

2. Burning out.—The use of fire to widen control lines and to remove islands or wide strips of unburned fuel within control lines.

3. Mopup burning.—The use of fire during the final stages of control efforts to remove islands of unburned fuel or extend the "black line" of control.

It is difficult to set any hard-and-fast rules for handling the variety of fire situations that may be encountered, but some preliminary guidelines may be helpful. Concerned in particular with the use of counter firing and burning out, rather than mopup burning, these guidelines are intended as aids in the application of suppression fires while wildfires are active and uncontrolled.

As the fire-control technologist gains experience, he can expand these guidelines to fit fuel, weather, and fire behavior situations common to his area of operation. He will undoubtedly develop his own set of guidelines and practices that will, in turn, improve his chances of making correct fire-control decisions. In the meantime, if he accepts the following nine points as a training aid and starting point, he will shorten the time required to become a fully competent fire control technologist.

1. Suppression firing IS NOT recommended as a control measure for the two-man crew, nor for any crew inexperienced in the use of fire. It is too risky for the inexperienced crew, and can only be recommended for the two-man experienced crew under the most unusual circumstances. Suppression firing should be applied by knowledgeable personnel backed up by an adequate supply of manpower and equipment to contain the set fire.

2. Suppression firing IS NOT recommended where plowed firebreaks and direct attacks will assure adequate control.

3. Suppression firing IS NOT recommended unless sufficient additional acreage can be sacrificed and adequate time allotted for appraising and evaluating the situation. Too often the failure of suppression fires has been traced to an unwillingness by the firefighting agency to sacrifice additional acreage or to take the time necessary to appraise the overall situation before initiating a suppression campaign.

4. Suppression firing IS recommended when wildfire intensities are such that firebreaks and direct attacks are ineffective or infeasible, where an experienced crew and adequate holding forces are available, and where time can be allocated and acreage sacrificed, under the limitations suggested herein.

5. Supression firing should employ burning techniques that will create needed isolation strips

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within a 30-minute period. Time is an important item to consider. Necessary isolation strips should be limited to a construction time of 30 minutes or less. In most situations, this necessitates the use of burning techniques (stripping, flanking, spotting, etc.) that are faster than backfiring. Longer time periods may result in unnecessary sacrifices of acreage as well as providing more opportunity for the wildfire to veer off course. In fast-spreading wildfires, the use of backfiring techniques are limited almost entirely to the flanks because of this time factor.

6. Suppression fires should be set from breaks that are far enough from the wildfire and with enough leadtime to permit the meeting of fire fronts at a point within the control line at least twice the observed spotting distance. The placement of firebreaks and suppression fires is important to insure that the wildfire and counter fire meet at a point within the baseline or control line where convection and spotting will not extend the blaze farther. If spotting distance is not observable or cannot be estimated, yet fire intensities are so great that suppression firing is warranted, the junction zone (where the two fires meet) should be *at least 100 feet* within the control line.

If suppression firing is called for in advance of a wildfire that is spreading at about 1 m.p.h. and spotting up to 100 feet, the following calculations are applicable:

a. Decide how close to the baseline or control line a meeting of the two fire fronts can be tolerated. In our example, a distance of 200 feet within the control line is considered acceptable: 100 feet (spotting distance) x 2 = 200 feet, or about 3 chains.

b. Estimate the time required for the set fire to burn out a 3-chain strip as it moves in 200 feet from the baseline. In our example, strip firing was contemplated, requiring about 20 minutes.

c. Calculate the spread of the wildfire during this 20-minute period. In this example, the wildfire would advance about 27 chains in 20 minutes.

d. Add the distance the wildfire is expected to travel in the estimated time period to the distance the set fire will travel: 27 chains + 3 chains = 30 chains, or about 1,980 feet.

e. Locate the firebreak, from which the suppression fire is to be set, at least 30 chains ahead of the advancing wildfire front.

f. Extend the firebreak and suppression fire laterally several chains beyond either side of the area where the wildfire is expected to strike to cover any unanticipated changes in movement of the fire front.

7. Suppression fires that produce burned-out strips between two or more firebreaks are preferred to those that permit the wildfire to meet an active line of fire. When fuel and topographic conditions and time limitations permit the use of tractor plows, it is often advisable to burn out a strip between two or more firelines before the wildfire front strikes. The strip should be wide enough to stop the fire's forward spread on the ground or by spotting. This strategy reduces the convective activity that usually occurs when two active lines of fire meet; spotting is consequently minimized.

8. Suppression fires should be set to take advantage of natural and manmade breaks whenever possible. A wide, clean break improves the chances of containing the set fire. Use of strategically located existing breaks reduces the time delay in setting fires and cuts down on the exposure of men and equipment to wildfire fronts.

9. Suppression firing gains credibility as fire-weather conditions become increasingly critical, up to the point where set fires cannot be contained within an optimum firebreak with large holding crews. As fire-weather conditions become more critical, the role of suppression firing generally increases. Under low and moderate fire days, normal plowing tactics and other direct control operations usually suffice; when fire weather is severe, normal control activities often fail. In most situations involving fast-spreading, high-intensity wildfires, an indirect attack with some form of suppression fire may offer the only safe means of control. Yet, when the fire danger (particularly Spread Index) exceeds a certain point, almost any control action—direct or indirect—becomes hazardous. Our best estimate of this critical point is at Spread Index 50.

SUMMARY

Success with suppression firing depends on: (1) being able to contain set fires within the breaks from which they are established; (2) creating isolation strips adequate to stop the advance of wildfires; (3) splitting or delaying the fire front, or steering it in a desired direction. When precarious situations are encountered, firebreaks must be wider and cleaner, holding crews must be larger and more knowledgeable, and suppression fires must be set farther ahead of the wildfire. A burned-out strip of fuel between two or more firebreaks is a logical treatment under these circumstances. If acreage cannot be sacrificed or adequate appraisal time allotted, the use of suppression firing cannot be recommended. Under the most serious conditions, suppression firing may have to be limited to the flanks until the wildfire head can eventually be cornered and snuffed out as the weather moderates or fuel continuity is broken.

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