

Background Paper *

“One Foot in the Black”

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Fighting Bushfires is a high-risk undertaking, with the most hazardous condition being the potential for burn injuries when the fires unexpectedly flares up and subjects the firefighter to high levels of radiant and convective heat. One of the most widely accepted concepts across the world of bushfire/wildfire suppression is that there must be a “safety zone” that firefighters can reach when threatened by the fire’s behavior.

The Concept

A highly successful application of the Safety Zone concept, used on bushfires ranging from the initial attack phase, through extended initial attack and on to the large fire suppression operational phase, is keeping “one foot in the black.”

Using the concept of “one foot in the black” allows the firefighter to have an ever-present safety zone in their immediate area. It capitalizes on the basic principals of the Fire Triangle (fuel/oxygen/heat) that are required for a fire to burn: the “black”, by definition, is an area where there is no longer any flammable material available to sustain fire and flames, thereby becoming a continuous, ever-moving safety zone for the firefighters.

Benefits

Of the 3 basic fireline construction techniques (direct, parallel, and indirect), the “direct” construction technique is the only instance where “one foot in the black” can be effectively utilized. It requires the firefighter to construct line in the immediate proximity of the fire, sometimes increasing the heat stress factor. There are several significant benefits to the firefighter’s safety that result from using the direct method of attack: the firefighter, because of his proximity to the flaming front, is much better able to recognize subtle changes in fire behavior that may become threatening; there is a greatly reduced time factor to reach the safety zone, since the “escape route” is typically less than one meter long; and it effectively eliminates the need to calculate the size of an effective safety zone that may be needed for an more intense fire with longer flame lengths. This can be an extremely critical issue, based upon experiences where designated safety zones proved to be insufficient for the experienced fire behavior and intensity.

Modifications to the Concept

A modification of the “one foot in the black” concept is to “bring your black with you”, that is, to burn out along the fireline as soon as it is constructed, thereby creating the same effect as constructing direct fireline along the fire’s edge. There are some minor risks and limitations inherent with this technique: the wind direction, fuel concentrations and distance from the actual bushfire may all impact the successful implementation of the procedure.

The Downside

Like any activity in bushfire suppression, there are potential negative possibilities that must be identified and mitigated: by using the direct attack method with “one foot in the black”, the firefighter may be subjected to higher radiant heat loads than would result from an indirect or parallel technique. Additionally, there have been previous incidents where firefighters have misjudged the adequacy of a burned over area to serve as a safety zone. This typically occurs when a ground fire burns the ground fuels, but does not consume the crowns. However, the desiccation of the aerial fuels in the crown may occur, resulting in ideal conditions for a “re-burn”. This condition has been notorious in past bushfires/wildfires for surprising firefighters who have not fully recognized the reburn potential of the fuels.

Conclusion

The bushfire suppression tactic of keeping “one foot in the black” is widely accepted as an important method of insuring firefighter access to an adequate safety zone on low to moderate bushfires. It incorporates the important principles of LCES (Lookouts, Communication, Escape routes, Safety zones), by allowing the on-the-ground firefighter a close up view of the fire behavior that may threaten them, an extremely short escape route, and a fully adequate safety zone that can be reached within seconds of an increase in the fire behavior. It is generally accepted among experienced bushfire/wildfire personnel as the safest method of constructing fireline.

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