

# MEASUREMENT OF ENERGY HEAT FLUX IN A CLEARING DURING PASSAGE OF A CROWN FIRE—ICFME 99

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## ABSTRACT

Clearings in forest stands, no matter how small, are often viewed as places of refuge in the event of a sudden, unexpected change in fire behavior. Over a period of several years, as part of the International Crown Fire Modelling Experiment (ICFME) in the Northwest Territories, attempts have been made to identify the clearing size necessary to provide refuge with a reasonable probability of survival. The third phase of ICFME carried out in 1999 provided an opportunity to instrument a clearing around a structure located in a mixed jack pine (*Pinus banksiana*)–black spruce (*Picea mariana*) stand and to assess the magnitude of the energy transfer to points within the clearing during a partial burn event. The clearing, approximately 10 m in diameter, was instrumented using 50 heat flux sensors, 5 at each of 10 locations, which respond to the total energy incident on the surface. No attempt was made to separate radiation and convection components as both contribute to the energy transfer to a person and in turn the expected level of injury. Measurements within the clearing are compared with those taken within the fuel type to illustrate the level of safety afforded by a clearing of this size within the particular fuel type. Expected levels of burn injury as a result of exposure to incident heat flux in the range of 20–80 kW/m<sup>2</sup> with common fire-resistant clothing protection are presented to help put the results in context.

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