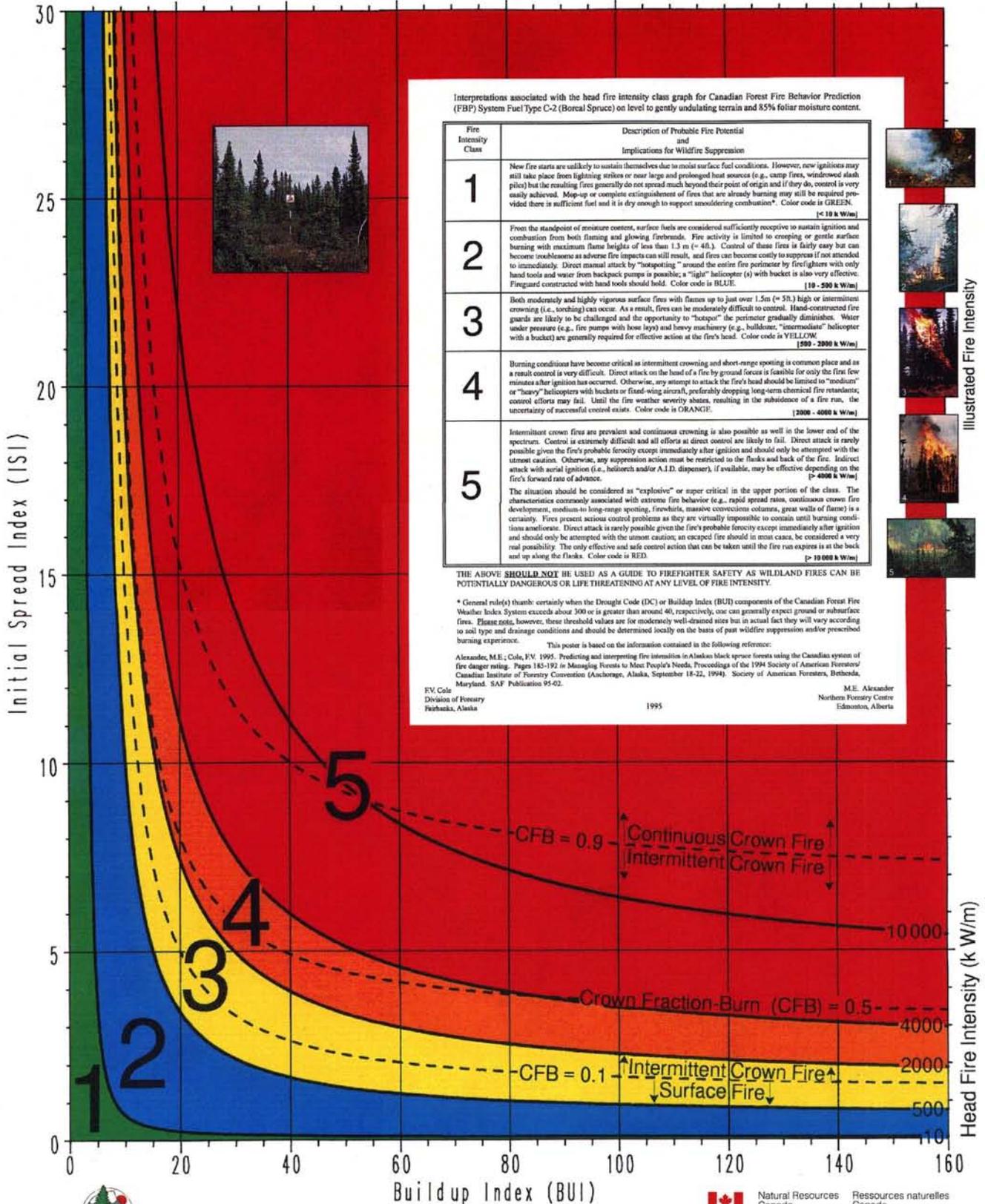


HEAD FIRE INTENSITY CLASS GRAPH For FBP System Fuel Type C-2 (Boreal Spruce)



Interpretations associated with the head fire intensity class graph for Canadian Forest Fire Behavior Prediction (FBP) System Fuel Type C-2 (Boreal Spruce) on level to gently undulating terrain and 85% foliar moisture content.

Fire Intensity Class	Description of Probable Fire Potential and Implications for Wildfire Suppression
1	New fire starts are unlikely to sustain themselves due to moist surface fuel conditions. However, new ignitions may still take place from lightning strikes or near large and prolonged heat sources (e.g., camp fires, windrowed slash piles) but the resulting fires generally do not spread much beyond their point of origin and if they do, control is very easily achieved. Mop-up or complete extinguishment of fires that are already burning may still be required provided there is sufficient fuel and it is dry enough to support smoldering combustion*. Color code is GREEN. [< 10 k W/m]
2	From the standpoint of moisture content, surface fuels are considered sufficiently receptive to sustain ignition and combustion from both flaming and glowing firebrands. Fire activity is limited to creeping or gentle surface burning with maximum flame heights of less than 1.3 m (≈ 4 ft.). Control of these fires is fairly easy but can become troublesome as adverse fire impacts can still result, and fires can become costly to suppress if not attended to immediately. Direct manual attack by "hotspotting" around the entire fire perimeter by firefighters with only hand tools and water from backpack pumps is possible; a "light" helicopter (s) with bucket is also very effective. Fireguard construction with hand tools should hold. Color code is BLUE. [$10 - 200$ k W/m]
3	Both moderately and highly vigorous surface fires with flames up to just over 1.5m (≈ 5 ft.) high or intermittent crowning (i.e., torching) can occur. As a result, fires can be moderately difficult to control. Hand-constructed fire guards are likely to be challenged and the opportunity to "hotspot" the perimeter gradually diminishes. Water under pressure (e.g., fire pumps with hose lays) and heavy machinery (e.g., bulldozer, "intermediate" helicopter with a bucket) are generally required for effective action at the fire's head. Color code is YELLOW. [$200 - 2000$ k W/m]
4	Burning conditions have become critical as intermittent crowning and short-range spotting is common place and as a result control is very difficult. Direct attack on the head of a fire by ground forces is feasible for only the first few minutes after ignition has occurred. Otherwise, any attempt to attack the fire's head should be limited to "medium" or "heavy" helicopters with buckets or fixed-wing aircraft, preferably dropping long-term chemical fire retardants; control efforts may fail. Until the fire weather severity abates, resulting in the subsidence of a fire run, the uncertainty of successful control exists. Color code is ORANGE. [$2000 - 4000$ k W/m]
5	Intermittent crown fires are prevalent and continuous crowning is also possible as well in the lower end of the spectrum. Control is extremely difficult and all efforts at direct control are likely to fail. Direct attack is rarely possible given the fire's probable ferocity except immediately after ignition and should only be attempted with the utmost caution. Otherwise, any suppression action must be restricted to the flanks and back of the fire. Indirect attack with aerial ignition (i.e., helicopter and/or A.I.D. dispenser), if available, may be effective depending on the fire's forward rate of advance. The situation should be considered as "explosive" or super critical in the upper portion of the class. The characteristics commonly associated with extreme fire behavior (e.g., rapid spread rates, continuous crown fire development, medium-to-long-range spotting, firewhirls, massive convection columns, great walls of flame) is a certainty. Fires present serious control problems as they are virtually impossible to contain until burning conditions ameliorate. Direct attack is rarely possible given the fire's probable ferocity except immediately after ignition and should only be attempted with the utmost caution; an escaped fire should in most cases, be considered a very real possibility. The only effective and safe control action that can be taken until the fire runs expires is at the back and up along the flanks. Color code is RED. [> 10000 k W/m]

THE ABOVE SHOULD NOT BE USED AS A GUIDE TO FIREFIGHTER SAFETY AS WILDLAND FIRES CAN BE POTENTIALLY DANGEROUS OR LIFE THREATENING AT ANY LEVEL OF FIRE INTENSITY.

* General rule(s) thumb: certainly when the Drought Code (DC) or Buildup Index (BUI) components of the Canadian Forest Fire Weather Index System exceeds about 300 or is greater than around 40, respectively, one can generally expect ground or subsurface fires. Please note, however, these threshold values are for moderately well-drained sites but in actual fact they will vary according to soil type and drainage conditions and should be determined locally on the basis of past wildfire suppression and/or prescribed burning experience.

This poster is based on the information contained in the following reference:
Alexander, M.E.; Cole, F.V. 1995. Predicting and interpreting fire intensities in Alaskan black spruce forests using the Canadian system of fire danger rating. Pages 185-192 in *Managing Forests to Meet People's Needs*, Proceedings of the 1994 Society of American Foresters/Canadian Institute of Forestry Convention (Anchorage, Alaska, September 18-22, 1994). Society of American Foresters, Bethesda, Maryland. SAF Publication 95-02.

F.V. Cole
Division of Forestry
Fairbanks, Alaska

1995

M.E. Alexander
Northern Forestry Centre
Edmonton, Alberta



Illustrated Fire Intensity

