INTERAGENCY NEWS

Canadian Fire Danger Rating System proves valuable tool in Alaska

By FRANK COLE
and M.E. ALEXANDER

In July 1992, after several seasons of informal field testing, Alaska's interagency fire management community decided to adopt the Canadian Forest Fire Danger Rating System in lieu of continuing to use the U.S. National Fire Danger Rating System.

The Canadian Forest Fire Danger Rating System is actually comprised of two primary subsystems or modules — the Canadian Forest Fire Weather Index System and the Canadian Forest Fire Behavior Prediction System.

The six standard component outputs of the Fire Weather Index are relative numerical ratings for various aspects of ignition ease, fire persistence and potential fire behavior for a reference fuel type on flat ground, based largely on continuous weather observations.

The Fire Behavior Prediction System provides estimates of certain fire behavior characteristics (for example, spread rate, intensity, fuel consumption, type of fire, fire size and shape) for specific weather conditions, fuel types and topographic situations. Two components of the Fire Weather Index, the Initial Spread Index (ISI) and Buildup Index (BUI), are major inputs into the Fire Behavior Prediction System. The ISI and BUI are relative numerical ratings that incorporate the combined effects of short- and long-term weather conditions on potential rate of fire spread and fuel available for combustion, respectively.

A fire intensity class graph for boreal spruce has been prepared utilizing the mathematical relationships and related criteria developed by the Canadians. They have also developed a computerized version of the graph, which allows the user to plot the values for a multitude of fire weather networks by administrative unit (district, region or area).

To determine the fire intensity class, simply find the point on the graph where the ISI and BUI intersect. The hyperbolas of fire intensity depicted in the graph imply that there are relatively distinct differences in fire characteristics and the effectiveness of various fire suppression resources for each fire intensity class. For example, on June 2, 1983, the day the Rosie Creek Fire near Fairbanks made its major run, the values of the ISI and BUI were 18 and 114, respectively. This placed it in the upper reaches of Fire Intensity Class 5. Eyewitness observations, photographs taken during the fire run and the post-burn evidence all attest to the extreme fire behavior and intensities that occurred on that day. Note that current weather conditions alone, as reflected by the ISI, would have been insufficient to properly gauge the fire intensity potential. The BUI played a key role in appraising the cumulative drying that had taken place in the medium and heavy fuels.

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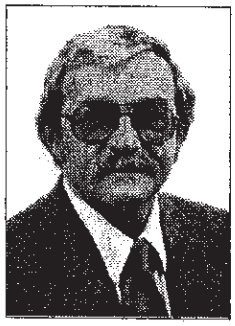
Plan now to attend Northwest Fire Council meeting in Kenai

By FRENCHIE MALOTTE



Everyone is invited to the Northwest Fire Council annual meeting in Kenai, Sept. 11-14. We're planning a program that will interest not only Alaskans, but our colleagues from the Yukon Territory, British Columbia, Washington and Oregon.

Richard Zabel, who works for the Northwest Fire Council in Portland, Oregon, is handling reservations for the conference. Contact him at (503) 226-4562, or 4033 SW Canyon Road, Portland, OR 97221, for registration material.

The program is called "Northern Exposures — an interactive symposium on fire in ecosystems management." If you're a firefighter, fire manager, safety professional; in the forest industry, fire service or aviation industry; or at a forestry university or a technical school, you should attend.

The conference begins Monday, Sept. 11, with an icebreaker, registration and vendor display in the afternoon, and the keynote welcome in the evening. The next day at the Kenai High School, speakers will address the role of fire, response to fire and supporting technology. Topics will include fire environment, behavior and effects; suppression and management implications; management responses, including cooperation, organizational structure and fire management plans; forest

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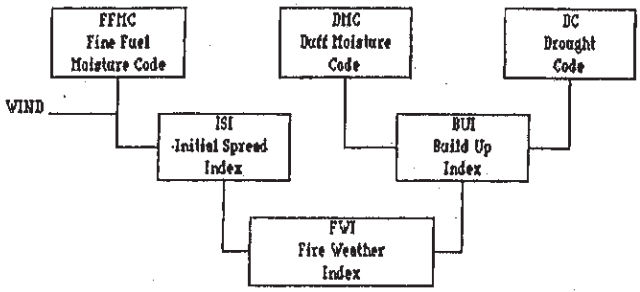
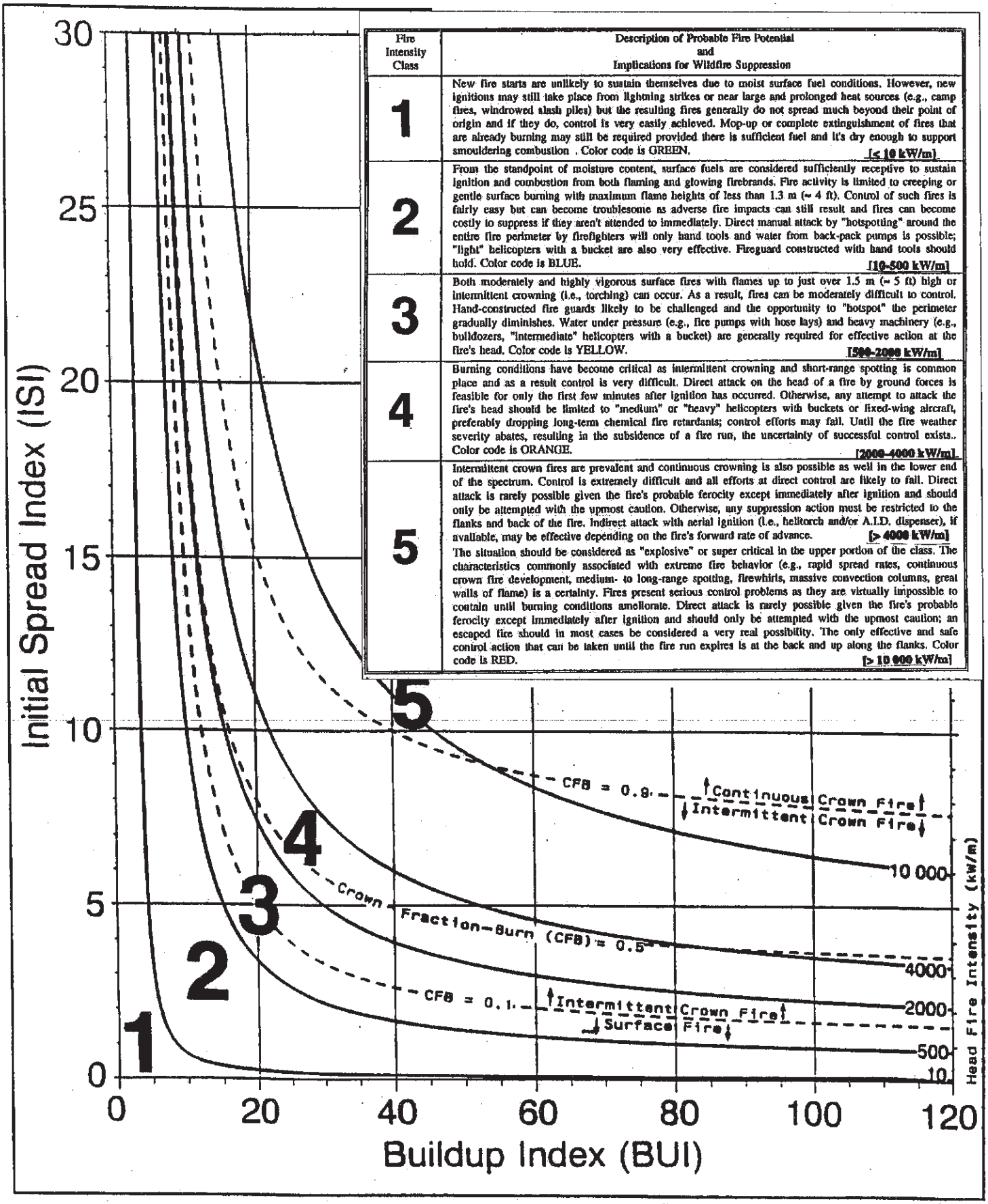
The Fine Fuel Moisture Code represents the moisture content of litter and cured fine fuels. It expresses the ease of ignition and fuel flammability. The Duff Moisture Code represents the moisture content of loosely compacted duff 5-10 cm deep that determines resistance to control. The Drought Code represents a deep layer of compact organic matter and indicates seasonal drought. The Initial Spread Index is figured by calculating the FFMC and wind. The Build Up Index is a calculation of the DMC and the DC. Together, the ISI and the BUI are used to determine the fire intensity class.



Fire Weather Index



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's dry enough to support smouldering combustion . Color code is GREEN. [< 10 kW/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 such fires is fairly easy but can become troublesome as adverse fire impacts can still result and fires can become costly to suppress if they aren't attended to immediately. Direct manual attack by "hotspotting" around the entire fire perimeter by firefighters will only hand tools and water from back-pack pumps is possible; "light" helicopters with a bucket are also very effective. Fireguard constructed with hand tools should hold. Color code is BLUE. [10-500 kW/m]
3	Both moderately and highly vigorous surface fires with flames up to just over 1.5 m (~ 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 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., bulldozers, "intermediate" helicopters with a bucket) are generally required for effective action at the fire's head. Color code is YELLOW. [500-2000 kW/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 kW/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 upmost caution. Otherwise, any suppression action must be restricted to the flanks and back of the fire. Indirect attack with aerial ignition (i.e., helitorch and/or A.I.D. dispenser), if available, may be effective depending on the fire's forward rate of advance. [> 4000 kW/m] 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 upmost 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 run expires is at the back and up along the flanks. Color code is RED. [> 10 000 kW/m]

Fire Intensity Graph

The graph is used to plot the head fire intensity class of boreal spruce on level to gently undulating terrain and at 85 percent foliage moisture content. The table describes probable fire potential and implications for wildfire suppression at each fire intensity class. It is not intended as a guide to firefighter safety, as wildland fires can be potentially dangerous or life-threatening at any level of fire intensity.

Cole, F.; Alexander, M.E. 1995. Canadian fire danger rating system proves valuable tool in Alaska. USDI Bureau Land Manage., Alaska Fire Serv., Fairbanks, AK. Fireline 8(3):2-3.