

Use of Posters for Interpreting Fire Behavior and Danger Research¹

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Northwest Territories

During the 1970's, Forestry Canada (then the Canadian Forestry Service) published three wall maps illustrating wildfire occurrence and fire climate patterns (6, 7, 10) that proved very popular among Canadian fire managers. More recently, five wall posters (1, 2, 3, 4, and 5) pertaining to the two major subsystems of the Canadian Forest Fire Danger Rating System (CFFDRS) (11) have been produced that illustrate how fire danger is assessed and wildfire behavior predicted in the boreal forest region of Canada (figs. 1-2). Four of the posters were authored solely by Forestry Canada fire research personnel or with the assistance of a cooperator. The first author

"The old cliché that a 'picture is worth a thousand words' certainly holds true for these posters."

—Headquarters manager, Regional Services, Manitoba Natural Resources, Winnipeg, MB

also supervised the preparation of the two posters illustrating the fuel type classification scheme associated with the CFFDRS (3, 4).

¹Based on an educational display used at the International Conference on "Meeting Global Wildland Fire Challenges: The People, the Land, the Resources," July 23-26, 1989, Boston, MA.

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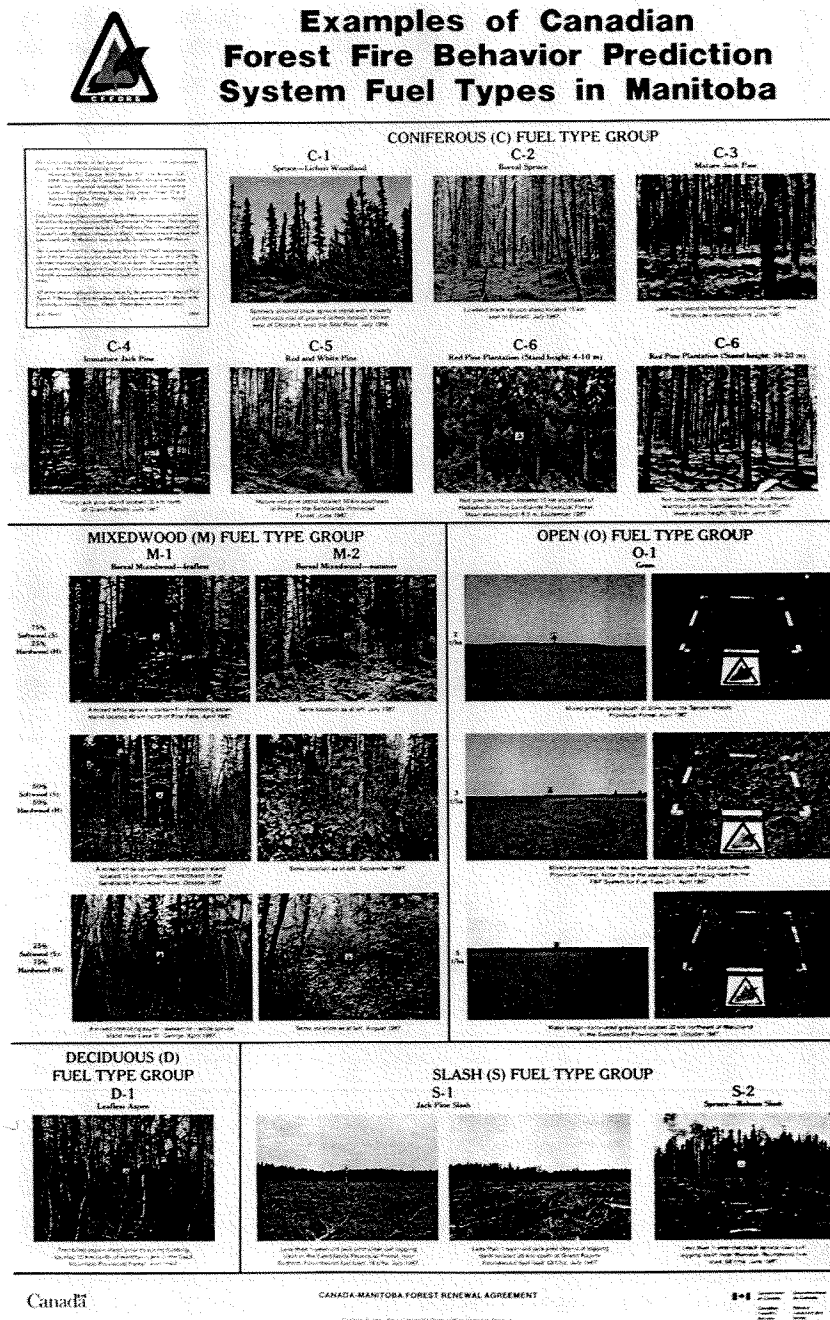



Figure 1—Photographic identification of fuel types in the province of Manitoba (4), based on the national classification scheme used in Canada for predicting fire behavior. A similar poster has been prepared for the province of Saskatchewan (3) and reproduced in the January 1988 issue of Forest Fire News.


FIRE BEHAVIOR IN BARK PINE FORESTS



Northern Forestry Centre
Edmonton, Alberta
Canada

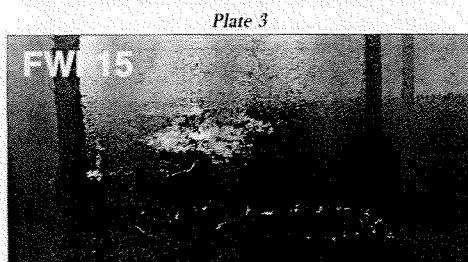
During the 1970s, when the Alberta Forest Service's Canadian Forestry Service, and other agencies were actively engaged in a wide range of research, the fire behavior in bark pine forests was a major concern. A series of experiments were conducted in the 1970s to determine the fire behavior in bark pine forests. The results of these experiments are presented in this poster. The poster was prepared by the Forest Service, Northern Forestry Centre, Edmonton, Alberta, Canada. The poster is available in French and English. The poster is available in French and English. The poster is available in French and English.

Plate 1



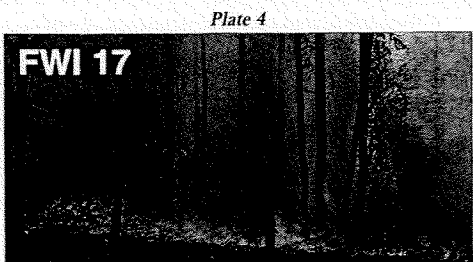
Experimental Fire Unit #	Date	Fire Weather Observations	FWI System Fuel Moisture Codes	Description of Fire Behavior
2	July 22	Wind direction: 280° Wind speed: 4 km/h Humidity: 68% Dew point: 12°C Cloud cover: 0	Fuel Moisture Code (FMC): 80 Duff Moisture Code (DMC): 50 Drought Code (DC): 10	The fire was a crown fire that spread rapidly through the canopy. The fire was very intense and produced a large amount of smoke. The fire was extinguished by the fire service.

Plate 3



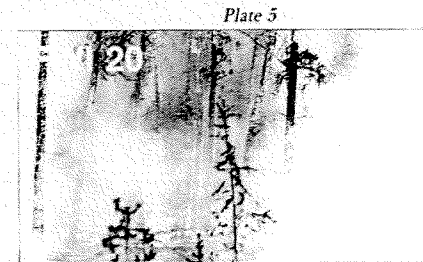
Experimental Fire Unit #	Date	Fire Weather Observations	FWI System Fuel Moisture Codes	Description of Fire Behavior
1	August 2	Wind direction: 270° Wind speed: 10 km/h Humidity: 58% Dew point: 10°C Cloud cover: 0	Fuel Moisture Code (FMC): 50 Duff Moisture Code (DMC): 30 Drought Code (DC): 10	The fire was a crown fire that spread rapidly through the canopy. The fire was very intense and produced a large amount of smoke. The fire was extinguished by the fire service.

Plate 4



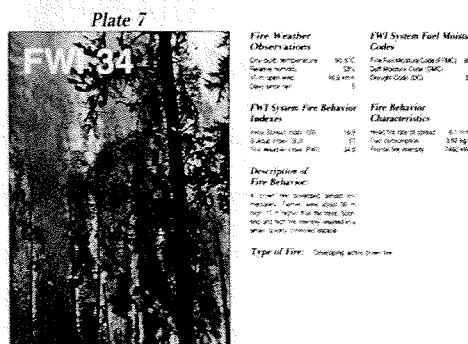
Experimental Fire Unit #	Date	Fire Weather Observations	FWI System Fuel Moisture Codes	Description of Fire Behavior
1	August 3	Wind direction: 280° Wind speed: 10 km/h Humidity: 45% Dew point: 8°C Cloud cover: 0	Fuel Moisture Code (FMC): 40 Duff Moisture Code (DMC): 30 Drought Code (DC): 10	The fire was a crown fire that spread rapidly through the canopy. The fire was very intense and produced a large amount of smoke. The fire was extinguished by the fire service.

Plate 5



Experimental Fire Unit #	Date	Fire Weather Observations	FWI System Fuel Moisture Codes	Description of Fire Behavior
1	August 5	Wind direction: 280° Wind speed: 10 km/h Humidity: 45% Dew point: 8°C Cloud cover: 0	Fuel Moisture Code (FMC): 40 Duff Moisture Code (DMC): 30 Drought Code (DC): 10	The fire was a crown fire that spread rapidly through the canopy. The fire was very intense and produced a large amount of smoke. The fire was extinguished by the fire service.

Plate 7



Experimental Fire Unit #	Date	Fire Weather Observations	FWI System Fuel Moisture Codes	Description of Fire Behavior
1	August 5	Wind direction: 90° Wind speed: 10 km/h Humidity: 25% Dew point: 8°C Cloud cover: 0	Fuel Moisture Code (FMC): 40 Duff Moisture Code (DMC): 10 Drought Code (DC): 10	The fire was a crown fire that spread rapidly through the canopy. The fire was very intense and produced a large amount of smoke. The fire was extinguished by the fire service.

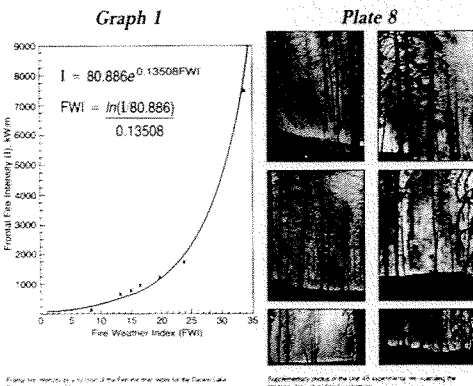
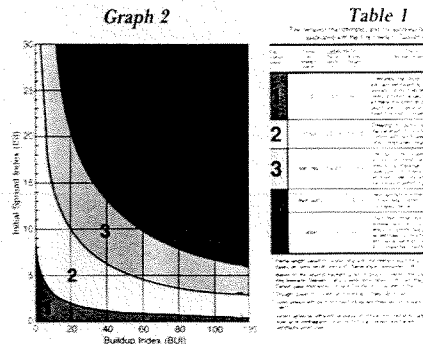


Plate 8



Graph 2

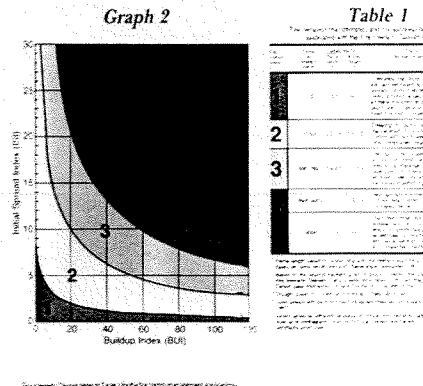


Table 1

Buildup Index (BU)	Initial Spread Rate (ISR) (m/min)
10	25
20	15
30	10
40	7
50	5
60	4
70	3.5
80	3
90	2.5
100	2

Figure 2—Relationship between the general index of fire danger used throughout Canada and fire intensity (1). A similar poster has also been prepared as a fuel type-specific guide to the quantitative prediction of fire behavior in the subarctic region of northwestern Canada (2).

Plate 2



Experiments Fire Log 2 Date: July 24

Fire Weather Observations	FWI System Fuel Moisture Codes	Description of Fire Behavior
Time of observation: 04:00	Fire Fuel Moisture Code (FFMC): 85.0	Spotted tree crown. Crown generally with less than 25% of fuel. No live fuel (20% of fuel) in observation. Crown of the tree with 100% of fuel and 100% of crown.
Relative humidity: 67%	Soil Moisture Code (SMC): 16	Some live fuel in crown (20% of fuel) in observation. Crown of the tree with 100% of fuel and 100% of crown.
Wind speed: 14 km/h	Drought Code (DC): 111	
Wind direction: 0		
FWI System Fire Behavior Indices	Fire Behavior Characteristics	Type of Fire
1-hr Spread Index: 1.0	Wind speed in km/h: 14	Very intense surface fire
5-min Fuel Moisture: 24	Fuel moisture: 100	
The Weather Index (WI): 12.7	Relative humidity: 67	

Plate 6



Experiments Fire Log 41 Date: August 4

Fire Weather Observations	FWI System Fuel Moisture Codes	Description of Fire Behavior
Time of observation: 11:00	Fire Fuel Moisture Code (FFMC): 82.0	Increased fire intensity and crown torching. Some live fuel in crown (20% of fuel) in observation. Crown of the tree with 100% of fuel and 100% of crown.
Relative humidity: 50%	Soil Moisture Code (SMC): 36	
Wind speed: 13 km/h	Drought Code (DC): 127	
Wind direction: 0		
FWI System Fire Behavior Indices	Fire Behavior Characteristics	Type of Fire
1-hr Spread Index: 1.5	Wind speed in km/h: 13	Very intense surface fire
5-min Fuel Moisture: 22	Fuel moisture: 100	
The Weather Index (WI): 12.7	Relative humidity: 50	

Acknowledgments

The authors wish to thank the following individuals for their assistance in the development of this poster: ...

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Alexander, M.E. 1988. Calculating and interpreting the weather index. ...

The Authors

Both authors are the respective officers with the Canadian Forest Fire Service Research and Development Division in the Northwest Region...

The fifth poster, entitled "Fire Behavior Characteristics and Suppression Interpretation Chart," is related to the Forest Fire Preparedness (FFP) System developed by fire management staff in the Northwest Territories for determining daily initial attack requirements (5). The FFP System, which is based in part on the CFFDRS, and the associated poster (issued in 1987) were both prepared with the technical assistance of the first author.

Response to the poster concept from the fire management community in Canada has been extremely positive. Some of these responses are reprinted following this article.

All five posters employ color photographs to depict representative fuel types or to illustrate readily observable fire characteristics (i.e., flame size and degree of crowning activity, if any). The posters vary in size from 16 x 34 inches (41 x 86 cm) to 34 x 40 inches (86 x 102 cm). The question of whether to produce a flat or folded version of a poster depends largely on mailing preference, such as the use of envelopes or mailing tubes. We published some of the posters in both formats.

Wall posters and maps appear ideally suited as interpretive aids of fire behavior and fire danger research and perhaps other kinds of forest fire research. In fact, several wall posters are being considered by the Ontario Region of Forestry Canada to depict some of the fire management applications of the extensive experimental burning program conducted during the past 20 years (9) (e.g., fire potential in jack pine slash in relation to woods closure guidelines, crown

fire behavior in mature versus immature jack pine stands, and fire hazard in spruce budworm-killed balsam fir stands) (8). Because of their general attractiveness and semipermanent presentation, a well-designed poster or map can be a highly effective mechanism for technology and information transfer, perhaps in many cases more so than other innovative media such as user-friendly computer programs and videotape productions. The unit cost is only slightly higher than that of more conventional publications. ■

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Feedback from Users

"The whole idea of using posters like this is excellent. A great way to get valuable information to field people."—*Director, Fire Operations, Department of Renewable Resources, Territorial Forest Fire Centre, Fort Smith, NT*

"I think they're a great way to convey a lot of research data in a readily comprehensible form."—*Research and development supervisor, Ontario Ministry of Natural Resources, Avia-*

tion and Fire Management Centre, Sault Ste. Marie, ON

"I particularly like the format of a poster versus a manual for quick reference and continual display."—*Forest protection officer, Alberta Forest Service, Bow/Crow Forest, Calgary, AB*

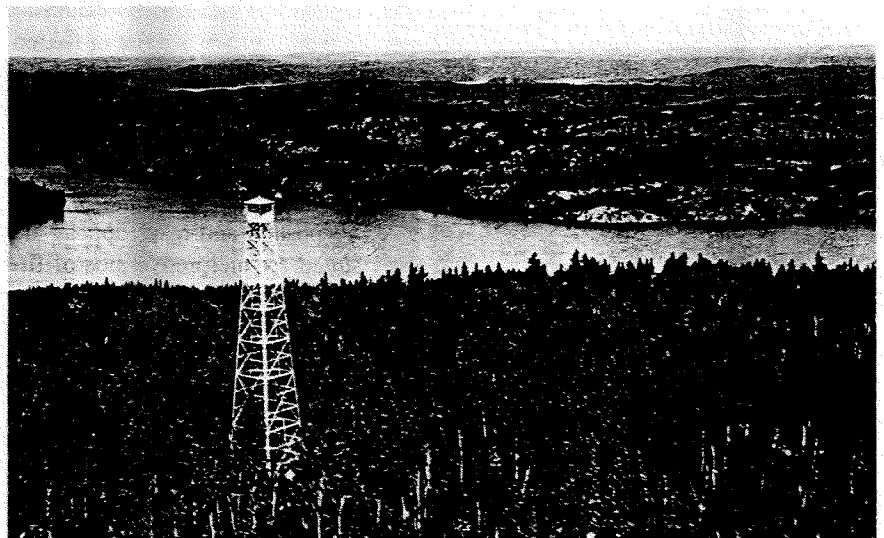
"I am of the opinion that the term 'user friendly' was coined to describe these posters. I have used them frequently since I received them and like the fast access to information that they offer."—*Conservation officer, Saskatchewan Parks, Recreation and Culture, Buffalo Narrows District, Buffalo Narrows, SK*

"They ... have a high educational value for field staff and even the public. These posters are the most effective media for relaying research information to field staff. ... It is a very creative way of illustrating a difficult subject."—*Operations supervisor, Manitoba Natural*

Resources, Whiteshell Region, Rennie, MB

"I am always pleased to see these kinds of aids. They allow me to refresh my memory quickly at the beginning of the fire season and help me understand the concerns of forestry personnel."—*Senior meteorologist, Atmospheric Environment Service, Western Region (forecast operations), Edmonton, AB*

"The pictures of fuels and fire behavior related to the CFFDRS are invaluable in teaching fire management, particularly since I put a great deal of emphasis on the CFFDRS in my courses. I also put on short courses for professionals and technicians, and I find the posters equally useful in this context. If we are serious about technology transfer then these are the kinds of tools we have to use."—*Professor, Department of Forest Resources, University of New Brunswick, Fredericton, NB. ■*



Kekekabic Lookout Tower with Lake Kekekabic in the heart of the wilderness country, Kawishiwi Ranger District on the Superior National Forest in Minnesota. Communication is by radio, and supplies are brought in either by canoe and portage or by plane. 400723

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