TECHNOLOGY TRANSFER NOTE

RELATIONSHIP BETWEEN THE CLADONIA FIRE HAZARD INDEX AND FINE FUEL MOISTURE CODE

A-011

The Cladonia Fire Hazard Index (CFHI) developed by Mactavish (1963) and the Fine Fuel Moisture Code (FFMC) component of the Canadian Forest Fire Weather Index System (Van Wagner 1987) are both currently used by the Alberta Forest Service in the Footner Lake and Athabasca Forests of northern Alberta as guides to judging fine fuel flammability. The AFS has asked the question: "What is the relationship between the CFHI and FFMC?" The purpose of this *Note* is to present a conversion table which permits a direct comparison to be made (Table 1). Some familiarity with the CFHI and FFMC on the part of the reader is presumed.

The CFHI/FFMC conversion table is based on nine years (1975-83) of data from the Lambert Creek Lookout in the Footner Lake Forest. Computer calculated values of the FFMC were derived from the daily weather observations (Van Wagner and Pickett 1985), while the archived values of the CFHI were used in the correlative analysis.

It's worth emphasizing that due to the differences in the mathematical structure of the FFMC and CFHI, a true physical linkage between the two does not exist. What's presented here is simply a statistically-derived relationship which should serve the operational needs of fire managers in areas where the widespread occurrence of cladonia-dominated fuel complexes contributes to a potentially serious fire problem.

Table 1. Cladonia Fire Hazard Index (CFHI) versus the Fine Fuel Moisture Code (FFMC)

CFHI		FFMC
Index value	Danger class[a]	range
0	Nil	≤28.6
1	Low	7-48.6
2	Low	48.7-68.4
3	Low	68.5-76.0
4	Low	76.1-79.7
5	Moderate	79.8-82.2
6	Moderate	82.3-84.2
7	Moderate	84.3-85.7
8	Moderate	85.8-87.0
9	High	87.1-88.2
10	High	88.3-89.2
11	High	89.3-90.1
12	High	90.2-90.9
13	Extreme	91.0-91.7
14	Extreme	91.8-92.4
15	Extreme	92.5-93.0
16	Extreme	≥93.1

[a]According to Williams (1963).

Government of Canada / Gouvernement du Canada
Canadian Forestry Service / Service canadien des forêts
Canada

REFERENCES

Mactavish, J.S. 1963. Cladonia fire hazard table-Alberta. Can. Dep. For., For. Res. Branch, Ottawa, Ontario. [Supplement to: Anonymous. 1959. Forest fire danger tables - Alberta. Can. Dep. North. Aff. Natl. Resour., For. Branch, Ottawa, Ontario].

Van Wagner, C.E. 1987. Development and structure of the Canadian Forest Fire Weather Index System. Can. For. Serv., Ottawa, Ontario. For. Tech. Rep. 35.

Van Wagner, C.E.; Pickett, T.L. 1985. Equations and FORTRAN program for the Canadian Forest Fire Weather Index System. Can. For. Serv., Ottawa, Ontario. For. Tech. Rep. 33.

Williams, D.E. 1963. Forest fire danger manual. Can. Dep. For., For. Res. Branch, Ottawa, Ontario. Publ. 1027.

K.G. Hirsch[1]
M.E. Alexander

June 1989

---

[1]Fire Research Officer, Forestry Canada, Northwest Region, Manitoba District Office, 104- 180 Main Street, Winnipeg, Man. R3C 1A6