

1957



FOREST FIRE DANGER TABLES  
1956

CANADA

NEW BRUNSWICK

Forestry  
Branch

Department  
of Northern  
Affairs and  
National  
Resources

Ottawa  
1957

## PRE FACE

This 1956 edition of the Forest Fire Danger Tables introduces a greatly simplified method of computing the Danger Index. Although these tables were derived in large measure from those of the 1948 edition, and retain their characteristic basic principles, modifications were made in some of them as a result of several years' research in areas for which field data had not previously been obtained.

Included in this edition are relative humidity tables, wind scale, Hazard Tables for some specific fuel types, and brief instructions. However, the Danger Index itself can be found by referring to only one set of facing pages once the few simple weather factors required have been recorded.

The change-over from use of the 1948 tables to the '56 tables may be accomplished at any time during the fire season, but all stations in one administrative area should make the change on the same date. New "Weather Record" forms and "Forest Fire Danger Charts" (see samples at back) have been prepared, but stocks of the old forms are quite satisfactory for use with the new tables.

Fire weather stations, weather observations, computations and uses of the Danger Index, and other matters relating to forest fire danger are discussed in detail in the "Forest Fire Danger Manual". Copies of both the tables and manual may be obtained from the Forestry Branch, Department of Northern Affairs and National Resources, Ottawa.

Table No. 4

FIRE DANGER TABLE

## SPRING AND SUMMER PERIOD

## FALL PERIOD

Today's Final Code Letter	0 to 3	4 to 6	7 to 10	11 to 16	17 to 24	25
Today's Danger Index						
B	0	0	1	3	4	5
C	0	0	1	3	4	5
D	0	1	2	3	4	5
E	1	2	3	4	5	6
F	3	4	5	6	7	8
G	4	5	6	7	8	9
H	5	6	7	8	9	10
I	6	7	8	9	10	11
J	6	7	8	9	10	11
K	7	8	9	10	11	12
L	8	9	10	11	12	13
M	9	10	11	12	13	14
N	9	10	11	12	13	14
O	10	11	12	13	14	15
P	10	11	12	13	14	15
Q	11	12	13	14	15	16
R	11	12	13	14	15	16
S	12	13	14	15	16	16
T	12	13	14	15	16	16

Today's Final Code Letter	0 to 3	4 to 6	7 to 10	11 to 16	17 to 24	25
Today's Danger Index						
B	0	0	1	3	4	5
C	0	0	1	3	4	5
D	0	1	2	3	4	5
E	1	2	3	4	5	6
F	2	3	4	5	6	7
G	3	4	5	6	7	8
H	4	4	5	6	7	8
I	4	5	6	7	8	9
J	5	6	7	8	8	9
K	5	7	8	9	9	10
L	6	7	8	9	10	11
M	7	8	9	9	10	11
N	7	8	9	10	11	12
O	8	9	10	11	12	13
P	9	10	11	12	13	14
Q	9	10	11	12	13	14
R	10	11	12	13	14	15
S	11	12	13	14	15	16
T	11	12	13	14	15	16

INSTRUCTIONS FOR CALCULATING FOREST FIRE DANGER

EACH table is to be used EVERY day as follows:

## Table No. 1 - Drought Index

- (i) In the first column on the left, locate yesterday's Drought Index.
- (ii) On the same line, in the proper column of "Depth of Rain in Inches", find today's Drought Index.
- (iii) Record the Drought Index on the Forest Fire Danger Chart.

## Table No. 2 - Rainfall

- (i) In the first column on the left, headed "Starting Danger Index", find yesterday's Danger Index.
- (ii) On the same line, in the proper column of "Depth of Rain in Inches", find Today's First Code Letter.

## Table No. 3 - Relative Humidity and Wind

- (i) In the first column on the left, find Today's First Code Letter.
- (ii) On the same line, in the correct "Relative Humidity" class and in the proper "Wind" column, find Today's Final Code Letter.

## Table No. 4 - Fire Danger Table

- (i) Choose the proper section according to the season.
- (ii) In the first column on the left, find Today's Final Code Letter.
- (iii) On the same line in the proper "Drought Index" column, find Today's Danger Index.
- (iv) Record Today's Danger Index on the Forest Fire Danger Chart.

CHANGE FROM THE SPRING AND SUMMER PERIOD TO THE FALL PERIOD ON SEPTEMBER 1

To start records in the Spring, see para. 5 of General Instructions

Table No. 5

SLASH FIRE HAZARD TABLE

## SPRING AND SUMMER PERIOD

Today's Danger Index	Today's Drought Index			
	0	1 to 3	4 to 10	11 or more
	Today's Hazard Index			
B*	0	0	0	0
C*	1	1	1	1
0	3	4	2	1
1	6	7	5	2
2	9	10	8	5
3	11	11	10	7
4	12	12	12	9
5	13	13	13	12
6	13	13	14	14
7	14	14	14	15
8	14	14	15	15
9	14	14	15	15
10	14	14	15	16
11	15	15	15	16
12	15	15	16	16
13 to 16	16	16	16	16

## FALL PERIOD

Today's Danger Index	Today's Drought Index			
	0	1 to 3	4 to 10	11 or more
	Today's Hazard Index			
B*	0	0	0	0
C*	0	0	0	0
0	2	3	1	1
1	5	6	4	1
2	7	8	6	3
3	10	10	8	5
4	11	12	11	8
5	12	12	12	10
6	12	12	13	13
7	12	13	13	14
8	12	13	14	14
9 & 10	13	13	14	15
11 & 12	14	14	15	15
13 & 14	15	15	15	16
15 & 16	16	16	16	16

\* When "Today's Final Code Letter" (Table 3) is either 'B' or 'C' use this letter in "Today's Danger Index" column instead of the Danger Index obtained in Table 4.

INSTRUCTIONS FOR CALCULATING SLASH FIRE HAZARD

1. Compute today's Fire Danger Index (Table No. 4).
2. Choose the proper section according to the season.
3. In the first column on the left, find today's Danger Index.
4. On the same line in the proper "Drought Index" column, find Today's Hazard Index.
5. Record Today's Hazard Index on the Forest Fire Danger Chart.

CHANGE FROM SPRING AND SUMMER TO THE FALL PERIOD on the same date that you start using the Fall Period of the Danger Index Table.

EXAMPLE:

Suppose that on May 23, the Danger Index computed for that day is 12 and the Drought Index 7.

Find 12 in the left-hand column of the Spring and Summer section of Table No. 5. On the same line and in the column for a Drought Index of 4 to 10 find the Hazard Index for May 23rd, 16.

Suppose that on May 24, 0.64 inch of rain fell at 11 a.m., and at noon the Relative Humidity is 89% and the wind speed 3 mph.

From Table No. 3 you will get the final code letter for May 24th, B. Find B in the left-hand column of Table No. 5. On the same line, in the column for a Drought Index of 0, find the Hazard Index 0.

Table No. 6

FAST DRYING HAZARD TABLE

## SPRING AND SUMMER PERIOD

Today's Danger Index	Today's Drought Index						
	0	1	2 to 6	7 to 10	11 to 16	17 to 24	25
	Today's Hazard Index						
0	0	0	0				
1	0	1	1	1			
2	2	4	4	2			
3	4	5	6	4	3		
4	6	7	8	6	5	4	
5	7	8	9	7	6	5	4
6	9	9	10	9	8	7	6
7	10	10	11	10	9	8	8
8	11	11	12	11	11	10	10
9	12	12	13	12	12	11	11
10	13	13	14	13	13	12	12
11	14	14	14	14	14	13	13
12	15	15	15	15	15	14	14
13 & 14	16	16	16	16	16	15	15
15 & 16	16	16	16	16	16	16	16

## FALL PERIOD

Today's Danger Index	Today's Drought Index						
	0	1	2 to 6	7 to 10	11 to 16	17 to 24	25
	Today's Hazard Index						
0	0	0	0				
1	0	1	1	1			
2	1	2	2	2			
3	3	4	5	3	2		
4	5	6	8	6	4	2	
5	7	8	9	7	6	4	2
6	9	9	10	9	8	6	4
7	10	10	11	10	9	8	6
8	11	11	12	11	11	10	8
9	12	12	13	12	12	11	10
10	13	13	14	13	13	12	11
11	14	14	14	14	14	13	12
12	14	15	15	15	14	14	14
13	15	15	15	15	15	15	14
14	16	16	16	15	15	15	15
15 & 16	16	16	16	16	16	16	16

INSTRUCTIONS FOR CALCULATING FAST DRYING FIRE HAZARD

1. Compute today's Fire Danger Index.
2. Choose the proper section according to the season.
3. In the first column on the left, find Today's Danger Index.
4. On the same line, in the proper "Drought Index" column, find Today's Hazard Index.
5. Record Today's Hazard Index on the Forest Fire Danger Chart.

CHANGE FROM SPRING AND SUMMER TO THE FALL PERIOD on the same date that you start using the Fall Period of the Danger Index Tables.

EXAMPLE:

Suppose that on May 25 you calculate the Danger Index to be 5 and the Drought Index 1.

- (i) Choose the section headed Spring and Summer.
- (ii) In the left-hand column find a Danger Index of 5.
- (iii) On the same line, in the column for Drought Index 1 find the Hazard Index 8.

#### INSTRUCTIONS FOR CALCULATING GRASS FIRE HAZARD

1. Choose the proper section according to the percentage of green grass\* as last observed.
2. In the first column on the left of the page, find Today's Relative Humidity.
3. On the same line in the proper column for the time since rain, find Today's Uncorrected Hazard Index.
4. In the left-hand column of the Seasonal Correction Table, find Today's Uncorrected Hazard Index.
5. On the same line, in the proper column for the month, find Today's Hazard Index.
6. Record Today's Hazard Index on the Forest Fire Danger Chart.

#### NOTE:

Rains of less than 0.02 inch are not used in this table. Times of rainfall are used in the table as follows:

- (i) Rain ending after 8 a.m. today - column "8 a.m. to noon".
- (ii) Rain ending between 6 p.m. yesterday and 8 a.m. this morning - column "Before 8 a.m."
- (iii) Rain ending yesterday before 6 p.m. - column "1 Day Since Rain".

#### EXAMPLE:

Suppose that on July 10, the relative humidity is 37%, the grass is 50% green and the last rain of 0.02 inch or more fell 3 days ago.

- (i) Choose the section headed "Grass 46% Green or more".
- (ii) In the left-hand column find a relative humidity of 37%.
- (iii) On the same line in the column for 3 days since rain of 0.02 inch or more, find the Uncorrected Hazard Index of 7.
- (iv) In the left-hand column of the Seasonal Correction Table, find Today's Uncorrected Hazard Index, 7.
- (v) On the same line in the column headed MAY, JUNE, JULY, find Today's Corrected Hazard Index, 8.

#### \*INSTRUCTIONS FOR ESTIMATING THE PERCENTAGE OF GREEN GRASS

Select a typical grass area that has not been burned, grazed, or mowed for at least three years, and make observations regularly once a week. To begin with it will be found helpful to break off a few handfuls of grass at ground level and to sort out the green and brown grass into two separate piles. If the amount in the two piles is equal the grass is 50% green. If one-quarter of the grass is in the green pile and three-quarters in the brown pile the grass is 25% green, and so on.

After a little practice, with care and judgement, you should be able to estimate the percentage of green grass without picking it up. The best method is to select several small 'plots' about two feet square, examine each plot carefully, and take the average. The grass must be pried apart to find the amount of dead material, not yet rotted away, under the present season's growth.

Table No. 7

GRASS FIRE HAZARD TABLE

GRASS 15% GREEN OR LESS										GRASS 16% to 25% GREEN									
Today's Relative Humidity %	0.02 in. or more rain since 6 p.m. yesterday		Days Since Rain of 0.02 in. or more						0.02 in. or more rain since 6 p.m. yesterday		Days Since Rain of 0.02 in. or more								
	8 a.m. to noon	Before 8 a.m.	1	2	3	4	5	6 or more	8 a.m. to noon	Before 8 a.m.	1	2	3	4	5	6 or more			
	Today's Uncorrected Hazard Index																		
25 or less	10	14	16	16	16	16	16	16	8	11	13	14	15	15	15	15			
26 to 35	8	12	14	15	15	16	16	16	7	10	12	13	13	13	14	14			
36 to 45	6	10	12	13	14	14	14	14	5	8	10	11	12	12	12	12			
46 to 55	4	8	10	11	12	12	12	12	4	6	8	10	10	10	11	11			
56 to 65	3	6	7	9	10	10	10	10	3	5	7	8	9	9	9	9			
66 to 75	2	4	5	7	8	8	8	8	2	4	5	7	7	8	8	8			
76 to 85	1	3	4	6	6	6	6	6	1	3	4	5	6	6	6	6			
86 or more	0	2	4	5	5	6	6	6	0	2	3	5	5	6	6	6			

GRASS 26% to 45% GREEN										GRASS 46% GREEN OR MORE									
Today's Relative Humidity %	0.02 in. or more rain since 6 p.m. yesterday		Days Since Rain of 0.02 in. or more						0.02 in. or more rain since 6 p.m. yesterday		Days Since Rain of 0.02 in. or more								
	8 a.m. to noon	Before 8 a.m.	1	2	3	4	5	6 or more	8 a.m. to noon	Before 8 a.m.	1	2	3	4	5	6 or more			
	Today's Uncorrected Hazard Index																		
25 or less	6	8	9	11	11	12	12	12	4	5	6	8	8	9	9	9			
26 to 35	5	7	8	10	10	11	11	11	3	5	6	7	8	8	8	8			
36 to 45	4	6	8	9	9	10	10	10	3	4	6	7	7	8	8	8			
46 to 55	3	6	7	8	9	9	9	9	2	4	5	6	7	7	7	7			
56 to 65	2	4	6	7	8	8	8	8	2	4	5	6	6	7	7	7			
66 to 75	2	3	5	6	7	7	7	7	1	3	4	5	6	6	6	6			
76 to 85	1	3	4	5	6	6	6	6	1	3	4	5	6	6	6	6			
86 or more	0	2	3	5	5	6	6	6	0	2	3	5	5	5	5	5			

SEASONAL CORRECTION TABLE

Uncorrected Hazard Index	MAY JUNE JULY			SEPTEMBER and OCTOBER
	APRIL	AUGUST		
	Today's Corrected Hazard Index			
0	0	0	0	0
1	1	2	0	0
2	2	3	1	0
3	3	4	2	0
4	4	5	3	1
5	5	6	4	2
6	6	7	5	3
7	7	8	6	4
8	8	9	7	5
9	9	10	8	6
10	10	11	9	7
11	11	12	10	8
12	12	13	11	9
13	13	14	12	10
14	14	15	13	12
15	15	16	14	13
16	16	16	15	14





### SCALE FOR ESTIMATING WIND VELOCITY

For best results this Wind Scale should be used at a well-exposed open place near the forest, with suitable trees for observation. Estimates should be made over a period of at least 5 minutes - the longer the better. If the wind is gusty, estimate the average wind over the whole period.

Effects of Wind	Wind Velocity, miles per hour
Smoke rises vertically; no movement of leaves of bushes or trees.	Less than 1
Leaves of trembling aspen in constant motion; small branches of bushes sway; tall grasses and weeds sway and bend with wind; wind vane barely moves.	1 to 3
Trees of pole size in the open sway gently; wind is felt distinctly on face; loose scraps of paper move; wind flutters small flag.	4 to 7
Trees of pole size in the open sway very noticeably; large branches of trees in the open toss; tops of trees in dense stands sway; wind extends small flag; a few crested waves form on lakes.	8 to 12
Trees of pole size in open sway violently; whole trees in dense stands sway noticeably; dust is raised in road.	13 to 18
Branchlets are broken from trees; inconvenience is felt in walking against wind.	19 to 24
Tops and branches are broken from trees; walking against wind is difficult; structural damage; shingles are blown off.	25 to 38

### Sample Weather Record and Forest Fire Danger Chart

The example in the following pages shows how weather records are kept and how fire danger charts are prepared.

Weather Record - The weather readings required for the danger index computation are entered in the section headed "Noon Readings" and the exact time noted. The rainfall, if any, is entered in the next line. Usually a hygrometer is used to determine the relative humidity. The dry bulb and wet bulb readings from this instrument are recorded next and, from them, the relative humidity is determined using the Relative Humidity Tables at the front of this book. The estimated or measured wind velocity is entered in the next line. These are all the weather values necessary to compute the fire danger index. Further information may be filled in according to the instructions of the local supervisor. Spaces are provided at the bottom of the page in which to note, if known, time of beginning and time of ending of rain.

Danger Chart - Rainfall is plotted in the top section of the Danger Chart. A short rain may be shown as an upright line, whereas a long rain is best plotted as a triangle indicating on the 0.00 line the time of beginning and time of ending of each rain. On occasion these times must be estimated. The actual depth of rain is clearly written just above the mark or triangle. Those weather values marked with an asterisk on the weather record are transferred to the Danger Chart and entered in the boxes provided.

The days' Danger Index can then be computed by referring in turn to Tables 1, 2, 3, and 4.

The Hazard Index is obtained by applying the computed danger index to the required Hazard Table.

In the example it is assumed that we are starting the records at the beginning of the fire season and that three days have passed since the snow melted enough to allow fires to run in the open. Therefore, according to the "General Instructions" we can assume that for May 6th the Drought Index is 3 and the Danger Index 8. Our first noon weather observations, made at 12:10 p.m. on Monday, May 7th, are entered as shown and we may proceed to compute the Danger and Hazard Indices following the instructions given with the tables.

The same procedure is followed every day except when noon weather readings cannot be taken because of rain. For example, on Friday rain was falling at noon and continued past 2 p.m. No weather observations therefore were taken and no index was computed. On Saturday, Thursday's Index, 5, must be used as the "Starting Danger Index" in Table No. 2.

# WEATHER RECORD

*Poplar Creek*

Forest Weather Station

From May 7 to May 13 19 56 Observer John Doe  
 (Month & Date) (Month & Date)

Date	7	8	9	10	11	12	13
	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
8 A.M. READINGS: Time	8 AM	8 AM	8 AM	8 AM		8:15 AM	8:10 AM
Maximum Temperature	72	79	80	71		55	59
Minimum Temperature	38	50	55	53		49	48
Depth of Rain	-	-	-	-		0.12	-
Sky Condition	P. Cloudy	P. Cloudy	Cloudy	Clear		Cloudy	Clear
Visibility Distance	20	20	10	20		12	20
NOON READINGS: Time	12:10 PM	12:10 PM	12:15 PM	12:10 PM		12:10 PM	12:15 PM
* Depth of Rain	-	T	0.06	-		-	-
Hygrometer Dry Bulb	75	78	68	72		57	63
Hygrometer Wet Bulb	54	61	55	67		55	51
* Relative Humidity	22	37	43	78		88	42
* Wind Velocity	11	8	3	2		5	14
Wind Direction	SW	W	SE	SE		W	NW
Sky Condition	Clear	P. Cloudy	P. Cloudy	Cloudy		P. Cloudy	P. Cloudy
Visibility Distance	20	12	20	12		7	20
OTHER READINGS: Time					6:00 PM		
Maximum Temperature					74		
Minimum Temperature					50		
Depth of Rain					1.65		
Hygrometer Dry Bulb					53		
Hygrometer Wet Bulb					51		
Relative Humidity					88		
Wind Velocity					4		
Wind Direction					E		
Sky Condition					Cloudy		
Visibility Distance					10		
TIME RAIN BEGAN		11 <sup>45</sup> / <sub>A</sub>	8 <sup>45</sup> / <sub>A</sub>	7 <sup>10</sup> / <sub>P</sub>	-	During Night	
TIME RAIN ENDED		11 <sup>50</sup> / <sub>A</sub>	9 <sup>30</sup> / <sub>A</sub>	-	5 <sup>25</sup> / <sub>P</sub>	7 <sup>15</sup> / <sub>A</sub>	
REMARKS							

\* Required for computing forest fire danger

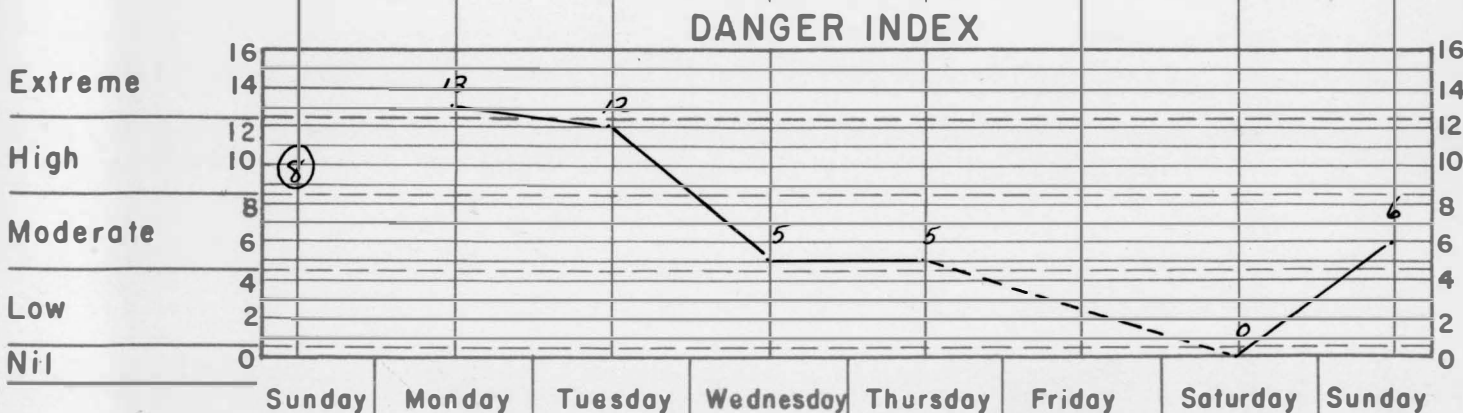
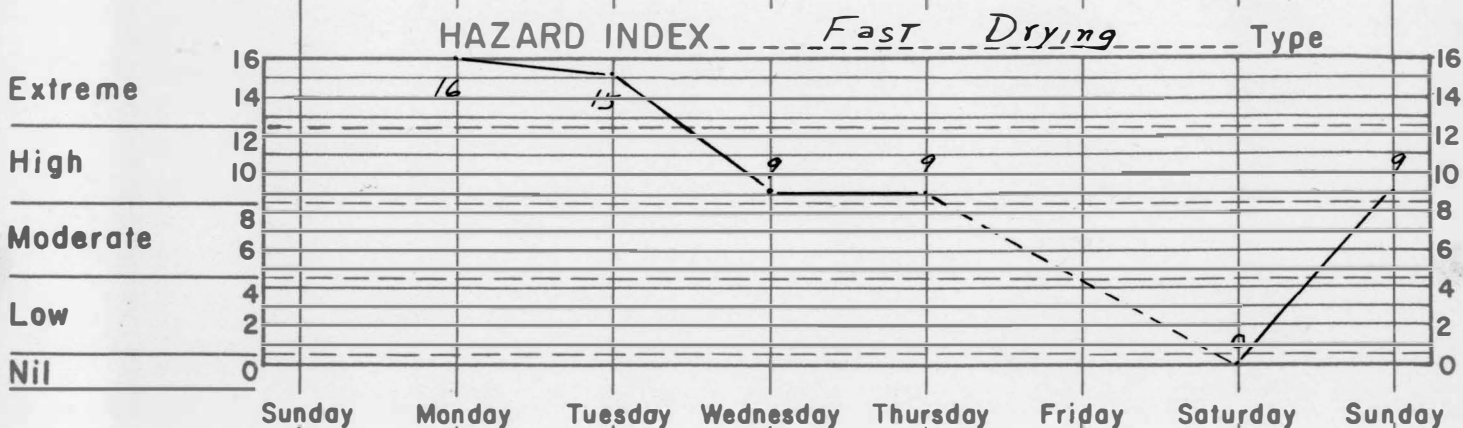
# FOREST FIRE DANGER CHART

*Poplar Creek*

FOREST WEATHER STATION

From *May 6* to *May 13* 19*56* Observer *John Doe*  
(Month and date) (Month and date)

Date	6	7	8	9	10	11	12	13
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.
Rainfall inches								
	0.50							0.50
				0.06		1.65	0.12	
	0.00		T	1			1	0.00
Relative Humidity%								
	-	22	37	43	78	-	88	42
Wind. Vel. m.p.h.								
	-	11	8	3	2	-	5	14
Drought Index								
	③	4	5	5	6	-	0	1



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