
**Maximum Spot Fire Distances for Burning Piles and
Wind-driven Surface Fires in Non-canopied Fuel Types
based on Albini's Models**

Prepared by

**Marty Alexander¹, PhD, RPF
Senior Researcher**

**Wildland Fire Operations Research Group
Forest Engineering Research Institute of Canada
Hinton, Alberta**

January 2006

¹ Completed while on secondment to FERIC. Permanent affiliation: Senior Fire Behavior Research Officer, Canadian Forest Service, Northern Forestry Centre, 5320-122 Street, Edmonton, Alberta T6H 3S5. E-mail: malexand@nrcan.gc.ca

Maximum spotting distances (km) assuming a receptive fuelbed, over level, non-forested terrain from burning of piled debris as a function of continuous steady flame height and wind speed.

Flame Height (m)	Speed (km/h)									
	5	10	15	20	25	30	35	40	45	50
1	<0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3
2	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5
3	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.7
4	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.8
5	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.9
6	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.1
7	0.1	0.2	0.4	0.5	0.6	0.7	0.8	0.9	1.1	1.2
8	0.1	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.2	1.3
9	0.1	0.3	0.4	0.6	0.7	0.8	1.0	1.1	1.2	1.4
10	0.1	0.3	0.4	0.6	0.7	0.9	1.0	1.2	1.3	1.5
11	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.3	1.4	1.6
12	0.2	0.3	0.5	0.7	0.8	1.0	1.2	1.3	1.5	1.7
13	0.2	0.4	0.5	0.7	0.9	1.1	1.2	1.4	1.6	1.8
14	0.2	0.4	0.6	0.7	0.9	1.1	1.3	1.5	1.7	1.8
15	0.2	0.4	0.6	0.8	1.0	1.2	1.3	1.5	1.7	1.9
16	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0
17	0.2	0.4	0.6	0.8	1.0	1.3	1.5	1.7	1.9	2.1
18	0.2	0.4	0.7	0.9	1.1	1.3	1.5	1.7	1.9	2.2
19	0.2	0.4	0.7	0.9	1.1	1.3	1.6	1.8	2.0	2.2
20	0.2	0.5	0.7	0.9	1.2	1.4	1.6	1.9	2.1	2.3
25	0.3	0.5	0.8	1.1	1.3	1.6	1.9	2.1	2.4	2.7
30	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0

Maximum spotting distances (km), assuming a receptive fuelbed, for wind-driven surface fires in non-canopied fuel types (grass, shrublands and slash) over level terrain as function of a continuous steady flame length and wind speed

Flame Length (m)	Speed (km/h)									
	5	10	15	20	25	30	35	40	45	50
1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5
2	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.8	0.8
3	0.2	0.4	0.5	0.6	0.7	0.8	0.8	0.9	1.0	1.1
4	0.3	0.4	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3
5	0.3	0.5	0.7	0.8	1.0	1.1	1.2	1.3	1.4	1.5
6	0.4	0.6	0.8	0.9	1.1	1.2	1.4	1.5	1.6	1.8
7	0.4	0.7	0.9	1.1	1.2	1.4	1.5	1.7	1.8	1.9
8	0.5	0.7	1.0	1.2	1.3	1.5	1.7	1.8	2.0	2.1
9	0.5	0.8	1.0	1.3	1.5	1.6	1.8	2.0	2.2	2.3
10	0.5	0.8	1.1	1.3	1.6	1.8	2.0	2.2	2.3	2.5
11	0.6	0.9	1.2	1.4	1.7	1.9	2.1	2.3	2.5	2.7
12	0.6	1.0	1.3	1.5	1.8	2.0	2.2	2.4	2.6	2.8
13	0.6	1.0	1.3	1.6	1.9	2.1	2.4	2.6	2.8	3.0
14	0.7	1.1	1.4	1.7	2.0	2.2	2.5	2.7	2.9	3.2
15	0.7	1.1	1.5	1.8	2.1	2.3	2.6	2.9	3.1	3.3
16	0.7	1.2	1.5	1.9	2.2	2.5	2.7	3.0	3.2	3.5
17	0.8	1.2	1.5	1.9	2.3	2.6	2.8	3.1	3.4	3.6
18	0.8	1.3	1.7	2.0	2.4	2.7	3.0	3.2	3.5	3.8
19	0.8	1.3	1.7	2.1	2.4	2.8	3.1	3.4	3.6	3.9
20	0.9	1.4	1.8	2.2	2.5	2.9	3.2	3.5	3.8	4.1
25	1.0	1.6	2.1	2.5	3.0	3.3	3.7	4.1	4.4	4.7
30	1.1	1.8	2.4	2.9	3.4	3.8	4.2	4.6	5.0	5.4