

APPENDIX B

FIRE BEHAVIOR FUEL MODELS

version 1.0 (September 2005)

The following pages detail the FBFMs observed in the NFFPD, their unique characteristics and expected fire behavior (Scott and Burgan 2005). These pages can be used as a pull-out section for field reference.

Adjective class definitions for expected/predicted fire behavior

Adjective class	Rate of Spread (ch/hr)	Flame Length (ft)
Very Low	0 - 2	0 - 1
Low	2 - 5	1 - 4
Moderate	5 - 20	4 - 8
High	20 - 50	8 - 12
Very High	50 - 150	12 - 25
Extreme	> 150	> 25

Non-burnable fuel type models (NB)

Description:

These non-burnable "fuel models" are included to provide consistency in how the non-burnable portions of the landscape are displayed on a fuel model map. In all NB fuel models there is no fuel load -- wildland fire will not spread. The gap in the NB numbering sequence is to retain fuel model numbers 98 as open water and 99 as "rock", as has been convention in the FARSITE system.

Expected fire behavior:

no fire spread

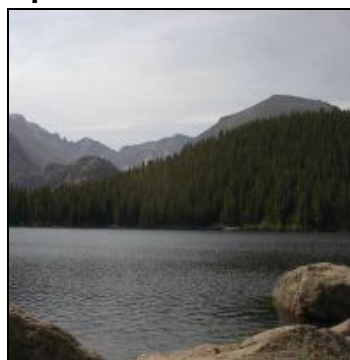
NB1 (91) urban/developed



NB2 (92) snow/ice



NB8 (98) open water



GR1 (101) Short, sparse dry climate grass (dynamic)



Description:

The primary carrier of fire in GR1 is sparse grass, though small amounts of fine dead fuel may be present. The grass in GR1 is generally short, either naturally or by heavy grazing, and may be sparse or discontinuous. The moisture of extinction of GR1 is indicative of a dry climate fuelbed, but GR1 may also be applied in high-extinction moisture fuelbeds because in both cases predicted spread rate and flame length are very low (compared to other GR fuel models).

Fine fuel load (t/ac): 0.40
Characteristic SAV (1/ft): 2054
Packing ratio (dimensionless): 0.00143
Extinction moisture content (percent): 15

Expected fire behavior:

Very low to low

GR2 (102) Low load, dry climate grass (dynamic)



Description:

The primary carrier of fire in GR2 is grass, though small amounts of fine dead fuel may be present. Load is greater than GR1, and fuelbed may be more continuous. Shrubs, if present, do not affect fire behavior.

Fine fuel load (t/ac): 1.10
Characteristic SAV (1/ft): 1820
Packing ratio (dimensionless): 0.00158
Extinction moisture content (percent): 15

Expected fire behavior:

Low to moderate

GS1 (121) Low load, dry climate grass-shrub (dynamic)



Description:

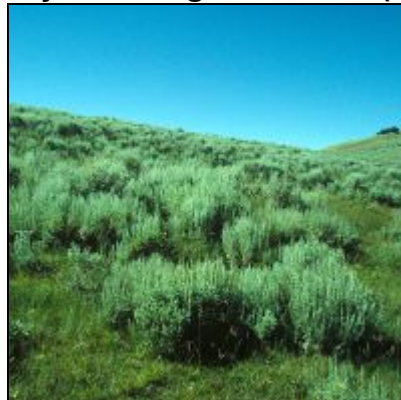
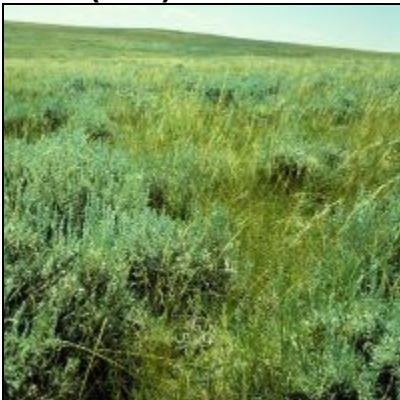
The primary carrier of fire in GS1 is grass and shrubs combined. Shrubs are about 1 foot high, grass load is low. Spread rate is high; flame length moderate. Moisture of extinction is low.

Fine fuel load (t/ac): 1.35
Characteristic SAV (1/ft): 1832
Packing ratio (dimensionless): 0.00215
Extinction moisture content (percent): 15

Expected fire behavior:

Moderate to high

GS2 (122) Moderate load, dry climate grass-shrub (dynamic)



Description:

The primary carrier of fire in GS2 is grass and shrubs combined. Shrubs are 1-3 feet high, grass load is moderate. Spread rate is high; flame length moderate. Moisture of extinction is low.

Fine fuel load (t/ac): 2.1
Characteristic SAV (1/ft): 1827
Packing ratio (dimensionless): 0.00249
Extinction moisture content (percent): 15

Expected fire behavior:

Moderate to high

SH1 (141) Low load dry climate shrub (dynamic)



Description:

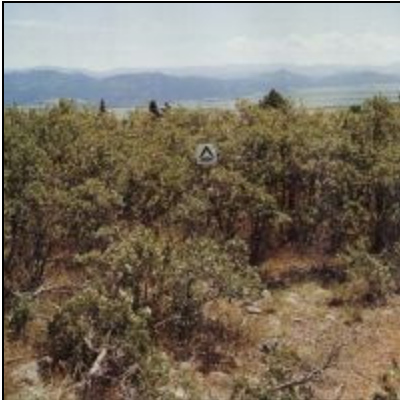
The primary carrier of fire in SH1 is woody shrubs and shrub litter. Low shrub fuel load, fuelbed depth about 1 foot; some grass may be present. Spread rate is high; flame length moderate.

Fine fuel load (t/ac): 1.7
Characteristic SAV (1/ft): 1674
Packing ratio (dimensionless): 0.00280
Extinction moisture content (percent): 15

Expected fire behavior:

Moderate to high

SH2 (142) Moderate load dry climate shrub



Description:

The primary carrier of fire in SH2 is woody shrubs and shrub litter. Moderate fuel load (higher than SH1), depth about 1 foot, no grass fuel present. Spread rate is moderate; flame length moderate.

Fine fuel load (t/ac): 5.2
Characteristic SAV (1/ft): 1672
Packing ratio (dimensionless): 0.01198
Extinction moisture content (percent): 15

Expected fire behavior:

Moderate

SH5 (145) High load dry climate shrub



Description:

The primary carrier of fire in SH5 is woody shrubs and shrub litter. Heavy shrub load, depth 4-6 feet. Spread rate is very high; flame length very high.

Fine fuel load (t/ac): 6.5

Characteristic SAV (1/ft): 1252

Packing ratio (dimensionless): 0.00206

Extinction moisture content (percent): 15

Expected fire behavior:

Very high

SH7 (147) Very high load dry climate shrub



Description:

The primary carrier of fire in SH7 is woody shrubs and shrub litter. Very heavy shrub load, depth 4-6 feet. Spread rate lower than SH5, but flame length similar. Spread rate is very high; flame length very high.

Fine fuel load (t/ac): 6.9

Characteristic SAV (1/ft): 1233

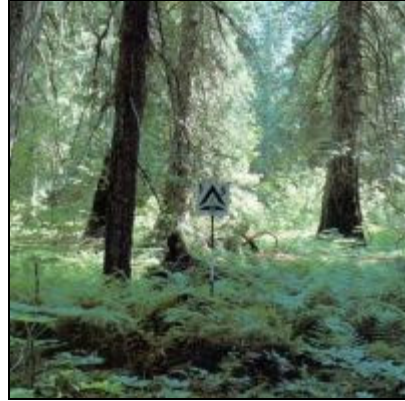
Packing ratio (dimensionless): 0.00344

Extinction moisture content (percent): 15

Expected fire behavior:

Very high

TU1 (161) Low load dry climate timber-grass-shrub



Description:

The primary carrier of fire in TU1 is low load of grass and/or shrub with litter. Spread rate is low; flame length low.

Fine fuel load (t/ac): 1.3

Characteristic SAV (1/ft): 1606

Packing ratio (dimensionless): 0.00885

Extinction moisture content (percent): 20

Expected fire behavior:

Low

TU5 (165) Very high load dry climate timber-shrub



Description:

The primary carrier of fire in TU5 is heavy forest litter with a shrub or small tree understory. Spread rate is moderate; flame length high.

Fine fuel load (t/ac): 7.0

Characteristic SAV (1/ft): 1224

Packing ratio (dimensionless): 0.02009

Extinction moisture content (percent): 25

Expected fire behavior:

Moderate to high

TL1 (181) Low load compact conifer litter



Description:

The primary carrier of fire in TL1 is compact forest litter. Light to moderate load, fuels 1-2 inches deep. Spread rate is very low; flame length very low. May be used to represent a recently burned forest.

Fine fuel load (t/ac): 1.0

Characteristic SAV (1/ft): 1716

Packing ratio (dimensionless): 0.04878

Extinction moisture content (percent): 30

Expected fire behavior:

Very low

TL3 (183) Moderate load conifer litter



Description:

The primary carrier of fire in TL3 is moderate load conifer litter, light load of coarse fuels. Spread rate is very low; flame length very low.

Fine fuel load (t/ac): 0.50

Characteristic SAV (1/ft): 1532

Packing ratio (dimensionless): 0.02630

Extinction moisture content (percent): 20

Expected fire behavior:

Very low

TL8 (188) Long-needle litter



Description:

The primary carrier of fire in TL8 is moderate load long-needle pine litter, may include small amount of herbaceous load. Spread rate is moderate; flame length low.

Fine fuel load (t/ac): 5.8

Characteristic SAV (1/ft): 1770

Packing ratio (dimensionless): 0.03969

Extinction moisture content (percent): 35

Expected fire behavior:

Low to moderate