# **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	Bate 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

Adjective class definitions for expected/predicted fire behavior

# 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



## **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:** 

Expected fire bei

Very low

# <image>

#### **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