

SCOTT AND BURGAN FUEL MODELS (2005) - “THE NEW 40”

- Determine the general fire-carrying fuel type (**grass, grass/shrub, shrub, timber/understory, timber litter, slash**).
- Determine general climate for your area (**arid, semi-arid, sub-humid, humid**). TIMBER LITTER Fuel models do not have climate groupings.
- Match **fuel model** description (fuel depth, fuel load, fuel continuity) with fuels of interest.

1. Nearly pure grass and/or forb type (Grass):

- **Arid to semiarid climate (rainfall deficient in summer). Extinction moisture content is 15%.**

GR1-Grass is short, patchy and possibly heavily grazed. Spread rate moderate; flame length low.

GR2-Moderately coarse continuous grass, average depth about 1ft. Spread rate high; flame length moderate.

GR4-Moderately coarse continuous grass, average depth about 2ft. Spread rate very high; flame length high.

GR7-Moderately coarse continuous grass, average depth about 3ft. Spread rate very high; flame length very high.

- **Subhumid to humid climate (rainfall adequate in all seasons). Extinction moisture content is 30 - 40 %.**

GR1-Grass is short, patchy, and possibly heavily grazed. Spread rate moderate; flame length low.

GR3-Very coarse grass, average depth about 2 ft. Spread rate high; flame length moderate.

GR5-Dense, coarse grass, average depth about 1 - 2ft. Spread rate very high; flame length high.

GR6-Dryland grass about 1 - 2 ft tall. Spread rate very high; flame length very high.

GR8-Heavy, coarse, continuous grass 3 - 5 ft tall. Spread rate very high; flame length very high.

GR9-Very heavy, coarse, continuous grass 5 - 8 ft tall. Spread rate extreme; flame length extreme.

2. Mixture of grass and shrub, up to about 50 percent shrub coverage (Grass-Shrub)

- **Arid to semiarid climate (rainfall deficient in summer). Extinction moisture content is 15 %.**

GS1-Shrubs are about 1 ft high, low grass load. Spread rate moderate; flame length low.

GS2-Shrubs are 1 - 3 ft high, moderate grass load. Spread rate high; flame length moderate.

- **Subhumid to humid climate (rainfall adequate in all seasons). Extinction moisture content is 30 – 40%.**

GS3-Moderate grass/shrub load, average grass/shrub depth < 2 ft. Spread rate high; flame length moderate.

GS4-Heavy grass/shrub load, depth greater than 2 ft. Spread rate high; flame length very high.

3. Shrubs cover at least 50 percent of the site; grass sparse to nonexistent (Shrub)

- **Arid to semiarid climate (rainfall deficient in summer). Extinction moisture content is 15 %.**

SH1-Low shrub fuel load, fuelbed depth about 1 ft; some grass may be present. Spread rate very low; flame length very low.

SH2-Moderate fuel load (higher than SH1), depth about 1 ft, no grass fuel present. Spread rate low to moderate; flame length low to moderate.

SH5-Heavy shrub load, depth 4 - 6 ft. Spread rate very high; flame length very high.

SH7-Very heavy shrub load, depth 4 - 6 ft. Spread rate lower than SH5, but flame length similar. Spread rate high; flame length very high.

- **Subhumid to humid climate (rainfall adequate in all seasons). Extinction moisture content is 30 – 40%**

SH3-Moderate shrub load, possibly with pine overstory or herbaceous fuel, fuel bed depth 2 - 3 ft. Spread rate low; flame length low.

SH4-Low to moderate shrub and litter load, possibly with pine overstory, fuel bed depth about 3 ft. Spread rate high; flame length moderate.

SH6-Dense shrubs, little or no herb fuel, depth about 2 ft. Spread rate high; flame length high.

SH8-Dense shrubs, little or no herb fuel, depth about 3 ft. Spread rates high; flame length high.

SH9-Dense, finely branched shrubs with significant fine dead fuel, about 4 - 6 ft tall; some herbaceous fuel may be present. Spread rate high, flame length very high.

4. Grass or shrubs mixed with litter from forest canopy (Timber-Understory)

- **Semiarid to Subhumid climate. Extinction moisture content is 20 %.**

TU1-Fuelbed is low load of grass and/or shrub with litter. Spread rate low; flame length low.

TU4-Fuelbed is short conifer trees with grass or moss understory. Spread rate moderate; flame length moderate.

TU5-Fuelbed is high load conifer litter with shrub understory. Spread rate moderate; flame length moderate.

➤ *Humid climate. Extinction moisture content is 30 %.*

TU2-Fuelbed is moderate litter load with shrub component. Spread rate moderate; flame length low.

TU3-Fuelbed is moderate litter load with grass and shrub components. Spread rate high; flame length moderate.

5. Dead and down woody fuel (litter) beneath a forest canopy (Timber Litter)

➤ *Fuelbed is recently burned but able to carry wildland fire.*

TL1-Light to moderate load, fuels 1 - 2 in deep. Spread rate very low; flame length very low.

➤ *Fuelbed composed of broadleaf (hardwood) litter.*

TL2-Low load, compact. Spread rate very low; flame length very low.

TL6-Moderate load, less compact. Spread rate moderate; flame length low.

TL9-Very high load, fluffy. Spread rate moderate; flame length moderate.

➤ *Fuelbed composed of long-needle pine litter.*

TL8-Moderate load and compactness may include small amount of herbaceous load. Spread rate moderate; flame length low.

➤ *Fuelbed not composed broadleaf or long-needle pine litter.*

TL4-Moderate load, includes small diameter downed logs. Spread rate low; flame length low.

TL7-Heavy load, includes larger diameter downed logs. Spread rate low; flame length low.

TL3-Moderate load conifer litter. Spread rate very low; flame length low.

TL5-High load conifer litter; light slash or mortality fuel. Spread rate low; flame length low.

TL9-Very high load broadleaf litter; heavy needle-drape in otherwise sparse shrub layer. Spread rate moderate; flame length moderate.

6. Activity fuel (Slash) or debris from wind damage.

➤ *Fuelbed is activity fuel.*

SB1-Fine fuel load is 10 - 20 tons/acre, weighted toward fuels 1 - 3 in diameter class, depth is <1 ft. Spread rate moderate; flame length low.

SB2-Fine fuel load is 7 -12 tons/acre, evenly distributed across 0 - 0.25

SB3-Fine fuel load is 7 - 12 tons/acre, weighted toward 0 to 0.25 in diameter class, depth is >1 ft. Spread rate high; flame length high.

➤ *Fuelbed is blowdown*

SB2-Blowdown is scattered, with many trees still standing. Spread rate moderate; flame length moderate.

SB3-Blowdown is moderate, trees compacted to near the ground. Spread rate high; flame length high.

SB4-Blowdown is total, fuel bed not compacted, foliage still attached. Spread rate very high; flame length very high.

7. Insufficient wildland fuel to carry wildland fire under any condition (Nonburnable)

NB1-Urban or suburban development; insufficient wildland fuel to carry wildland fire.

NB2-Snow/ice.

NB3-Agricultural field, maintained in nonburnable condition.

NB8-Open water.

NB9-Bare ground.

ANDERSON FUEL MODELS - "THE ORIGINAL 13"

Primary carrier of the fire is GRASS

FM1-Grass is fine structured, generally below knee level, and cured primarily. Grass is essentially continuous. Spread rate moderate; flame length low. *Grasslands, savanna, grass tundra*

FM2-Grass is usually under an open timber or brush overstory. Litter from overstory is involved, but grass carries the fire. Expected ROS is < FM1 and intensity is < FM3. Spread rate moderate; flame length moderate. *Open shrub land and pine stands, some pinon-juniper*