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Fuel classification in aspen forest

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Dennis G. Simmerman and James K. Brown

This poster display illustrates the current development of fuel classification in aspen forests. Fuels and flammability vary considerably among aspen and mixed aspen/conifer forest types, depending upon plant community type, grazing influence, and quantities of downed woody material. The classification is based on these factors and permits managers to appraise rate of spread, fireline intensity, and likelihood of successfully using prescribed fire. Quantitative fuel information for each classification is also available and is useful in mathematical modeling of fire behavior. The classification's primary use is in planning prescribed fires and fire suppression activities.

Five overstory/understory cover classes have been delineated based on sample fuel loadings and modeled fire behavior for common community types found on the Bridger-Teton, Caribou, and Targhee National Forests: (1) Aspen/Shrub, (2) Aspen/Tall Forb, (3) Aspen/Low Forb, (4) Mixed/Shrub, and (5) Mixed/Forb. Differences among the classes are illustrated in the following tabulation of fine fuel loading and modeled fire behavior.

Fine fuels include herbaceous materials, shrubs, and downed woody material less than $\frac{1}{2}$ inch in diameter. A midflame windspeed of 6 m.p.h and fine fuel moisture contents of 8 percent were used in the fire behavior modeling, table 1.

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Table 1.--Fuel and fire behavior representative of aspen fuel classes

	Aspen			Mixed	
	Shrub	Tall forb	Low forb	Shrub	Forb
Fine fuel loading (lb/acre)	4,580	1,600	840	3,720	650
Rate of spread (ft/min)	11.1	6.5	2.6	3.4	2.2
Flame length (ft)	3.3	2.4	1.4	1.7	1.1

This tabulation represents average differences. Loading and fire behavior can vary substantially within classes, especially within the shrub and tall forb groups. This must be kept in mind when applying the classification to individual sites.

Flammability of each fuel class can be modified by grazing and accumulation of downed woody fuels. The tentative probabilities of successfully burning in these forest types and the influence of both grazing and woody fuel accumulation on the probabilities, are listed in table 2.

Table 2.--Adjective probabilities of successfully applying prescribed fire in aspen forests

Condition	Aspen			Mixed	
	Shrub	Tall forb	Low forb	Shrub	Forb
Ungrazed, light downed woody	Good	Fair	Poor	Good	Fair
Ungrazed, heavy downed woody	Good	Fair	Poor	Good	Good
Grazed, light downed woody	Fair	Poor	Poor	Fair	Fair
Grazed, heavy downed woody	Good	Poor	Poor	Good	Fair

Good: adequate burning conditions occur yearly.

Fair: adequate burning conditions occur every few years.

Poor: adequate burning conditions occur infrequently.