

****11/4/03 DRAFT****

**Fire Regime Condition Class (FRCC) Interagency Handbook
Reference Conditions**

Modeler: Kelly Pohl

Date: 9/3/03

PNVG Code: MCAN

Potential Natural Vegetation Group: Mixed Conifer

Geographic Area: Southwest

Description: Generally found in upper montane zone on steep to gentle slopes, predominantly on mesic, north-facing slopes. *Pseudotsuga menziesii*, *Pinus* spp., *Abies concolor*, *Juniperus* spp., and *Quercus gambelli* are present.

Fire Regime Description: Fire regime group I. Includes frequent surface and mixed-intensity fires (MFIs range from 3-20 years) with occasional replacement fires. Fires create large openings and mosaics of age structures.

Vegetation Type and Structure

Class	Percent of Landscape	Description
A: post replacement	10	Openings with grass, shrub, and forbs created after replacement fire. May have dense <i>Quercus gambelli</i> shrubs and seedlings of a variety of conifer species.
B: mid-development closed	5	>30% canopy cover of sapling or pole conifer species, mostly <i>Pseudotsuga menziesii</i> or <i>Abies concolor</i> .
C: mid- open	20	<30% canopy cover of sapling or pole <i>Pinus</i> spp. with some <i>Juniperus</i> spp. and <i>Quercus gambelli</i> .
D: late- open	60	<30% canopy cover of mature <i>Pinus ponderosa</i> with <i>Pseudotsuga menziesii</i> , <i>Abies concolor</i> , <i>Juniperus</i> spp, and <i>Quercus gambelii</i> .
E: late- closed	5	>30% canopy cover of mature conifers species, including <i>Pseudotsuga menziesii</i> , <i>Pinus</i> spp., <i>Abies concolor</i> , and <i>Juniperus</i> .
Total	100	

Fire Frequency and Severity

Fire Frequency-Severity	Modeled Probability	Percent , All	Description
-------------------------	---------------------	---------------	-------------

Fires			
Replacement Fire	.005	5	Occasional stand-replacement fires, mostly in B and E.
Non-Replacement Fire	.095	95	Frequent (about 10 year MFI) surface fires in C and D. Occasional mosaic fires in all types. Surface fires generally maintain open types and decrease density in closed types.
All Fire Frequency*	.100	100	

*Sum of replacement fire and non-replacement fire probabilities.

References

- Arno, Stephen F. 2000. Fire in western forest ecosystems. In: Brown, James K., Smith, Jane Kapler, eds. *Wildland fire in ecosystems: Effects of fire on flora*. General Technical Report RMRS-GTR-42 vol. 2. Ogden, UT: US Department of Agriculture, Forest Service, Rocky Mountain Research Station: 97-120.
- Baisan, Christopher H., and Swetnam, Thomas W. 1990. Fire history on a desert mountain range: Rincon Mountain Wilderness, Arizona, USA. *Canadian Journal of Forest Research* 20: 1559-1569.
- Baisan, Christopher H., Swetnam, Thomas W. 1997. Interactions of fire regimes and land use in the central Rio Grande Valley. Research Paper RM-RP-330. Fort Collins, CO: US Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 20 p.
- Baker, William L., and Ehle, Donna. 2001. Uncertainty in surface fire history: the case of ponderosa pine forests in the western United States. *Canadian Journal of Forest Research* 31: 1205-1226.
- Bastian, Henry V. 2001. Effects of low intensity prescribed fires on ponderosa pine forests in wilderness areas of Zion National Park, Utah. In: Vance, Regina K., Edminster, Carleton B., Covington, W. Wallace, and Blake, Julie A., compilers. *Ponderosa pine ecosystems restoration and conservation: Steps toward stewardship*. Conference proceedings, 2000 April 25-27, Flagstaff, AZ. Proceedings RMRS-P-22. Ogden, UT: US Department of Agriculture, Forest Service, Rocky Mountain Research Station: 43-48.
- Bastian, Henry V. 2001. Effects of low-intensity fire on a mixed conifer forest in Bryce Canyon National Park, Utah. In: Vance, Regina K., Edminster, Carleton B., Covington, W. Wallace, and Blake, Julie A., compilers. *Ponderosa pine ecosystems restoration and conservation: Steps toward stewardship*. Conference proceedings, 2000 April 25-27, Flagstaff, AZ. Proceedings RMRS-P-22. Ogden, UT: US Department of Agriculture, Forest Service, Rocky Mountain Research Station: 49-53.

Brown, Peter M., Kaye, Margot W., Huckaby, Laurie S., and Baisan, Christopher H. 2001. Fire history along environmental gradients in the Sacramento Mountains, New Mexico: Influences of local patterns and regional processes. *Ecoscience* 8(1): 115-126.

Brown, James K.; Smith, Jane Kapler, eds. 2000. Wildland fire in ecosystems: effects of fire on flora. Gen. Tech. Rep. RMRS-GTR-42-vol. 2. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 257 p.

Fule, Peter Z., Covington, W. Wallace, and Moore, Margaret M. 1997. Determining reference conditions for ecosystem management of southwestern ponderosa pine forests. *Ecological Applications* 7(3): 895-908.

Fule, Peter Z., Heinlein, Thomas A., Covington, W. Wallace, Moore, Margaret M. 2003. Assessing fire regimes on Grand Canyon landscapes with fire-scar and fire-record data. *International Journal of Wildland Fire* 12:129-145.

Humphries, H. C., and Bourgeron, P. S. 2003. Environmental responses of *Pinus ponderosa* and associated species in the south-western USA. *Journal of Biogeography* 30: 257-276.

Kaufmann, G. Alan, and Covington, W. Wallace. 2001. Effect of prescribed burning on presettlement ponderosa pines in Grand Canyon National Park. In: Vance, Regina K., Edminster, Carleton B., Covington, W. Wallace, and Blake, Julie A., compilers. *Ponderosa pine ecosystems restoration and conservation: Steps toward stewardship*. Conference proceedings, 2000 April 25-27, Flagstaff, AZ. Proceedings RMRS-P-22. Ogden, UT: US Department of Agriculture, Forest Service, Rocky Mountain Research Station: 36-42.

Kaufmann, Merrill R., Huckaby, Laurie S., Regan, Claudia, and Popp, John. 1998. Forest reference conditions for ecosystem management in the Sacramento Mountains, New Mexico. General Technical Report RMRS-GTR-19. US Department of Agriculture, Forest Service, Rocky Mountain Research Station: 87 p.

Kaufmann, Merrill R., Regan, Claudia M., and Brown, Peter M. 2000. Heterogeneity in ponderosa pine/Douglas-fir forests: age and size structure in unlogged and logged landscapes of central Colorado. *Canadian Journal of Forest Research* 30: 698-711.

Madany, Michael H., West, Neil E. 1980. Fire history of two montane forest areas of Zion National Park. In Stokes, M. A., and Dieterich, John H., technical coordinators. *Proceedings of the Fire History Workshop, October 20-24, 1980, Tucson, AZ*. General Technical Report RM-81. Fort Collins, CO: US Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 50-56.

Mast, Joy Nystrom, Fule, Peter Z., Moore, Margaret M., Covington, W. Wallace, and Waltz, Amy E. M. 1999. Restoration of presettlement age structure of an Arizona ponderosa pine forest. *Ecological Applications* 9(1): 228-239.

Schmidt, Kirsten M, Menakis, James P., Hardy, Colin C., Hann, Wendel J., Bunnell, David L. 2002. Development of coarse-scale spatial data for wildland fire and fuel management. Gen. Tech. Rep. RMRS-GTR-87. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 41 p. + CD.

Swetnam, T. W., and Baisan, C. H. 1996. Historical fire regime patterns in the southwestern United States since AD 1700. In: Allen, C. D., ed. Proceedings of the Second La Mesa Fire Symposium 29-30 March 1994, Los Alamos, New Mexico. General Technical Report RM-GTR-286. US Department of Agriculture, Forest Service, Rocky Mountain Research Station: 11-32.

White, Alan S. 1985. Presettlement regeneration patterns in a southwestern ponderosa pine stand. *Ecology* 66(2): 589-594.

U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (2002, December). Fire Effects Information System, Available online (3 September 2003): <http://www.fs.fed.us/database/feis/>.

VDDT Results (*Note: Some PrtScn's may be missing below)



