

APPENDIX E

Fire Regime Condition Class

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Appendix E – Fire Regime Condition Class

Process

The Fire Regime Condition Class (FRCC) is an expression of the departure of the current condition from the historical fire regime. It is an interagency, standardized tool for determining the degree of departure from reference conditions for vegetation, fuels and disturbance regimes (Reference conditions are defined as the composition of landscape vegetation and disturbance attributes that, to the best of our collective expert knowledge, can sustain current native ecological systems and reduce future hazards to native diversity – reference conditions should reflect characteristics that can be restored. These conditions are the baseline for determining departure from the natural or historical range.) Refer to <http://www.frcc.gov> for a detailed description and explanation of the FRCC determination process.

Low departure (FRCC 1) describes fire regimes and vegetation-fuel conditions considered to be within the reference condition range of variability, while moderate and high departures (FRCCs 2 and 3) characterize conditions outside of this reference condition range (Hann and Bunnell 2001; Hardy and others 2001; Schmidt and others 2002). The FRCC for the Proposed Land Management Plan revision was developed at a strategic, landscape level. The resultant coverage is consistent with national direction on the development and application of FRCC. Moreover, FRCC can be applied to all wildland vegetation and fuel conditions or to wildland fire situations.

The FRCC is based, in part, on the amount of departure from the historic range of variability (HRV) for both composition (species) and structure (size class). The methodology for determining HRV and the results is documented in Appendix B of this document. FRCC was also based on the amount of departure from historic fuels condition. Thus, the FRCC rating was developed from the combination of three items: dominance type rating for HRV, size class rating for HRV, and rating for fuels condition. The following information provides a description of the ratings for each of these items:

Size Class Rating

The HRV for size class was compared to current size classes from existing vegetation coverage. The existing vegetation coverage was developed from the Vegetation Mapping Project (VMAP), and updated for plantations, stand-replacing wildfire, and old growth. Vegetation Response Units (VRUs) were also included in the resulting existing vegetation coverage, providing habitat type groups for further modeling. Refer to Appendix G for documentation regarding updating and converting VMAP information. Size classes from the existing vegetation coverage were developed to be consistent with HRV and are as follows:

- Seedling/sapling (0 to 5 inches DBH)
- Small (5 to 10 inches DBH)
- Medium (10 to 15 inches DBH)
- Large (15 to 20 inches DBH)
- Very-large (20+ inches DBH)

To account for old growth as part of the FRCC, the very-large size class was compared to the HRV for old growth.

The habitat type groups included in the existing vegetation coverage were converted to the three biophysical groups found in HRV (warm/dry, warm/moist, and subalpine). Acres of size class by biophysical group were summarized and compared to HRV to develop a rating for current condition. Size classes within a biophysical group were rated as 1 if they were within Class A of HRV, 2 if they were in Class B, and 3 if they were in Class C.

Dominance Type Rating

The HRV for dominance type was compared to the current dominance type from the existing vegetation coverage (see Appendix G). Dominance types were grouped to be consistent with HRV. As with size class, habitat types groups included in the existing vegetation coverage were converted to the three biophysical groups found in HRV. Acres of dominance type by biophysical group were summarized and compared to HRV to develop a rating for current condition. Dominance types within a biophysical group were rated 1 if they were within the Class A of HRV, 2 if they were in Class B, and 3 if they were in Class C.

Fuels Rating

The fuel rating reflects the difference between existing and historic conditions. As with species and size, if the fuel condition was within a desired HRV, it was rated as 1, somewhat outside of HRV it was rated as 2, and further outside of HRV it was rated as 3.

The fuel rating was calculated using a modeled fire regime class, and size class and canopy cover from the existing vegetation coverage.

A natural fire regime is a general classification of the role that fire would play across a landscape in the absence of modern human mechanical intervention but includes the influence of aboriginal burning (Agee 1993; Brown 1995). Coarse-scale definitions for natural fire regimes were developed by Hardy and others (2001) and Schmidt and others (2002) and interpreted for fire and fuels management by Hann and Bunnell (2001). The five natural fire regimes are classified based on the average number of years between fires (fire frequency or Mean Fire Interval) combined with the severity of the fire (the amount of vegetation replacement) and its effect on the dominant overstory vegetation. These five natural fire regimes are as follows:

- I** 0- to 35-year frequency and low (surface fires most common) to mixed severity (less than 75 percent of the dominant overstory vegetation replaced);
- II** 0- to 35-year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced);
- III** 35- to 100+ -year frequency and mixed severity (less than 75 percent of the dominant overstory vegetation replaced);
- IV** 35- to 100+ -year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced);
- V** 200+ -year frequency and high (stand replacement) severity.

Table E-1 describes the rule set or model used in defining fire regime in the planning zone.

Table E-1 Fire Regime Class Model

VRU	Fire Regime Definition Rule
VRU1	All fire regime I
VRU2	South aspect, fire regime = I North aspect, fire regime = III
VRU3	Where aspect is southerly, fire regime = III where aspect is northerly, fire regime = IV
VRU4	Where aspect is southerly (VRU4S), fire regime = III Where aspect is northerly (VRU4N), fire regime = IV
VRU5	Where aspect is southerly (VRU5S), fire regime = IV Where aspect is northerly (VRU5N), fire regime = V
VRU6	All fire regime V
VRU7	Where aspect is southerly, fire regime = III Where aspect is northerly, fire regime = IV
VRU8	All fire regime V
VRU9	Where aspect is southerly, fire regime = III Where aspect is northerly, fire regime = IV
VRU10	South aspect, fire regime = III North aspect fire regime = V
VRU11	South aspect, fire regime = III North aspect fire regime = V
NF1	Fire regime = II
NF4	Fre regime = III
<p>NOTE:</p> <ul style="list-style-type: none"> • South aspect was defined as 113 – 292 degrees (southeast, west, south, and southwest). • North aspect was defined as 293 – 112 degrees (northwest, north, northeast, and east). • Flat areas were included with the south aspect. 	

Fire regimes were combined with density (canopy closure) and size class using the existing vegetation coverage. Table E-2, below, defines the fuel rating based on fire regime, size, and density.

Table E-2 Fuels Rating

Fire Regime	Seedling/Sapling (0-5" DBH)	Small (5-10" DBH)	Medium (10-15" DBH)	Large, Very large (15"+ DBH)
I	LOW (1)	LOW (1)	LOW, MOD (1)	LOW, MOD (1)
	MOD, HIGH (2)	MOD, HIGH (2)	HIGH (2)	HIGH (2)
II	LOW (1)	LOW (1)	LOW (1)	LOW (1)
	MOD, HIGH (2)	MOD, HIGH (2)	MOD, HIGH (3)	MOD, HIGH (3)
III	LOW, MOD, HIGH (1)	LOW, MOD, HIGH (1)	LOW, MOD (1)	LOW, MOD (1)
			HIGH (2)	HIGH (3)
IV	LOW, MOD, HIGH (1)	LOW, MOD, HIGH (1)	LOW, MOD (1)	LOW, MOD (1)
			HIGH (2)	HIGH (3)
V	LOW, MOD, HIGH (1)	LOW, MOD, HIGH (1)	LOW, MOD, HIGH (1)	LOW, MOD, HIGH (1)
<p>The following applies to this table:</p> <ul style="list-style-type: none"> • LOW is defined as 0-24.9 percent canopy cover. • MOD is defined as 25-59.9 percent canopy cover. • HIGH is defined as as greater than 60 percent canopy cover. • The number in parenthesis (1, 2, or 3) is the resultant fuels rating. 				

The ratings in Table E-2 were adjusted for fuels treatment. Areas where past fuels treatments had occurred (as identified in the Timber Stand Management Record System [TSMRS] database and stands layer), were rated as '1'. TSMRS activity codes 4961 through 4963, 4978 through 4980, and 4985, 4992, 4993, 4995, 4996 were used to identify past fuels treatments.

FRCC Rating

The ratings for HRV dominance type, HRV size class, and fuels were combined and an average rating for FRCC was calculated. Dominance type and size were weighted more heavily (two times) than fuels in developing the FRCC rating, as follows:

$$(2 * \text{dominance type rating}) + (2 * \text{size class rating}) + \text{fuels rating} / 5 = \text{FRCC rating}$$

The resulting coverage of FRCC is appropriate for use at the forest planning scale. Adjustments for site-specific conditions will be made for use at the project scale level.

Literature Cited

- Agee, J.K. 1993. *Fire Ecology of Pacific Northwest Forests*. Washington, DC: Island Press.
- Brown, J.K. 1995. *Fire Regimes and Their Relevance to Ecosystem Management*. Pages 171-178 in Proceedings of Society of American Foresters National Convention, Sept. 18-22, 1994. Anchorage, AK. Society of American Foresters, Wash. DC.
- Hann, W.J.; Bunnell, D.L. 2001. *Fire and Land Management Planning and Implementation across Multiple Scales*. International Journal of Wildland Fire. 10:389-403.
- Hardy, C.C.; Schmidt, K.M.; Menakis, J.M.; Samson, N.R. 2001. *Spatial Data for National Fire Planning and Fuel Management*. International Journal of Wildland Fire. 10: 353-372.
- Schmidt, K.M.; Menakis, J.P.; Hardy, C.C.; Hann, W.J.; Bunnell, D.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