****DRAFT****

Fire Regime Condition Class (FRCC) Interagency Handbook Reference Conditions

Modeler: Mike Schafale, Sharon Herman **Date: Feb. 11, 2004/ May 4, 2004** **PNVG Code: LLBS**

Potential Natural Vegetation Group: Longleaf Pine/Bluestem

Geographic Area: Southeast Virginia to Georgia, west to Texas.

Description: Dry to mesic woodland/savannas in portions of the Coastal Plain and Fall Zone where Aristida stricta is naturally absent. This is a patchy range, including a band along the Fall Zone, areas in southeast Virginia and adjacent North Carolina, a sizeable patch in southern South Carolina, and Louisiana and east Texas. The canopy is dominated by Pinus palustris or by a mixture of Pinus palustris with other pines and minority oaks. This is little cover and low density of shrubs or mid-story hardwoods under natural fire regimes. The ground cover is dense, dominated by grasses, primarily Schizachyrium spp. and Andropogon spp., generally with a diversity of legumes, composites, and other grasses. Canopy trees are patchy in distribution, with regeneration in canopy gaps of ¼ acre or less in size, mid-succesional clumps in patches similar size patches, and the oldest trees occurring as isolated individuals. The reference condition classes are aggregates of numerous patches well dispersed over the landscape. Canopy gaps are created by fire mortality, lightning, and wind throw at the scale of individual trees or several trees.

Uncharacteristic vegetation types include even-aged canopy stands in which age structure has been homogenized by logging or clearing, examples where loblolly pine, shortleaf pine, slash pine, or oaks have replaced some or all of the longleaf pine, and examples where the grass-dominated ground cover has been lost due to soil disturbance or past canopy closure. Full restoration to reference condition may take a number of burns, and may take many years if older trees are not present, but fire produces substantial ecological benefits before full restoration.

This group is distinguished from other Coastal Plain longleaf pine vegetation groups by occurring outside of the range of Aristida stricta and having Schizachyrium/Andropogon-dominated herb layers.

Fire Regime Description: Frequent surface fires, every 1-5 years. Fires are usually low in intensity overall, consuming only shrubs and herbs, but will occasionally kill young pine regeneration patches and rarely kill individual older trees. Individual fires cover extensive areas. Replacement fires are local patches of mortality within the context of these extensive low-intensity fires. Mosaic fire in the model represents the probability of a series of surface fires sufficient to move closed vegetation to open; single fires are generally ineffective.

Vegetation Type and Structure (based on surface fire return interval of .3 with 15 years to develop closed vegetation) See discussion below.

Class*	Percent of Landscape	Description
A: post replacement	10	Canopy gaps, most single tree to quarter acre size, with pine regeneration up to 15 years old. Native grassy ground cover. Tree cover 0 to 50%.
B: mid-seral closed	5	Patches, mostly ¼ acre or less, with canopy pines 15-75 years old, with substantial component of hardwoods or other pine

		species encroaching in the absence of fire. Hardwood/encroaching pine cover greater than 50%. Canopy pine cover 25-75%.
C: mid- seral open	45	Patches, most ¼ acre or less, with canopy pines 15-75 years old, with little hardwood component due to frequent fire. Grass-dominated ground cover. Canopy pine cover 25-75%.
D: late- seral open	35	Patches, most ¼ acre or less, with canopy pines 75 or more years old, with little component of hardwoods. Grass-dominated ground cover. Canopy pine cover 25-75%.
E: late- seral closed	5	Patches with canopy pines 75 or more years old, with a substantial component of hardwoods or pines other than longleaf in either the overstory or understory. Ground cover shrubby or sparse. Hardwood/encroaching pine cover greater than 50%.
Total	100	

*Formal codes for classes A-E are: AESP, BMSC, CMSO, DLSO, and ELSC, respectively.

Fire Frequency and Severity

Fire Severity	Fire Frequency (yrs)	Probability	Percent, All Fires	Description
Replacement Fire	100	.01	1%	Most replacement is in class A.
Non-Replacement Fire	1-5	.26	99%	Low intensity surface fires in all classes.
All Fire Frequency*	3	.27	100	

*All Fire Probability = sum of replacement fire and non-replacement fire probabilities. All Fire Fire Frequency = inverse of all fire probability (previous calculation).

Original model based on 04 fire return interval and 10 years to develop closed vegetatoin.

Class*	Percent of Landscape	Description
A: post replacement	10	Canopy gaps, most single tree to quarter acre size, with pine regeneration up to 15 years old. Native grassy ground cover. Tree cover 0 to 50%.
B: mid-seral closed	10	Patches, mostly ¼ acre or less, with canopy pines 15-75 years old, with substantial component of hardwoods or other pine species encroaching in the absence of fire. Hardwood/encroaching pine cover greater than 50%. Canopy pine cover 25-75%.
C: mid- seral open	40	Patches, most ¼ acre or less, with canopy pines 15-75 years old, with little hardwood component due to frequent fire. Grass-dominated ground cover. Canopy pine cover 25-75%.
D: late- seral open	30	Patches, most ¼ acre or less, with canopy pines 75 or more years old, with little component of hardwoods. Grass-dominated ground cover. Canopy pine cover 25-75%.
E: late- seral closed	10	Patches with canopy pines 75 or more years old, with a substantial component of hardwoods or pines other than longleaf in either the overstory or understory. Ground cover shrubby or sparse. Hardwood/encroaching pine cover greater than 50%.
Total	100	

*Formal codes for classes A-E are: AESP, BMSC, CMSO, DLSO, and ELSC, respectively.

Fire Frequency and Severity

Fire Severity	Fire Frequency (yrs)	Probability	Percent, All Fires	Description
Replacement Fire	100	.01	1%	Most replacement is in class A.
Non-Replacement Fire	1-5	.32	99%	Low intensity surface fires in all classes.
All Fire Frequency*	3	.33	100	

***All Fire Probability = sum of replacement fire and non-replacement fire probabilities. All Fire Fire Frequency = inverse of**

References

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.

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.

U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (2002, December). Fire Effects Information System, [Online]. Available: http://www.fs.fed.us/database/feis/.

PERSONAL COMMUNICATION (if applicable):

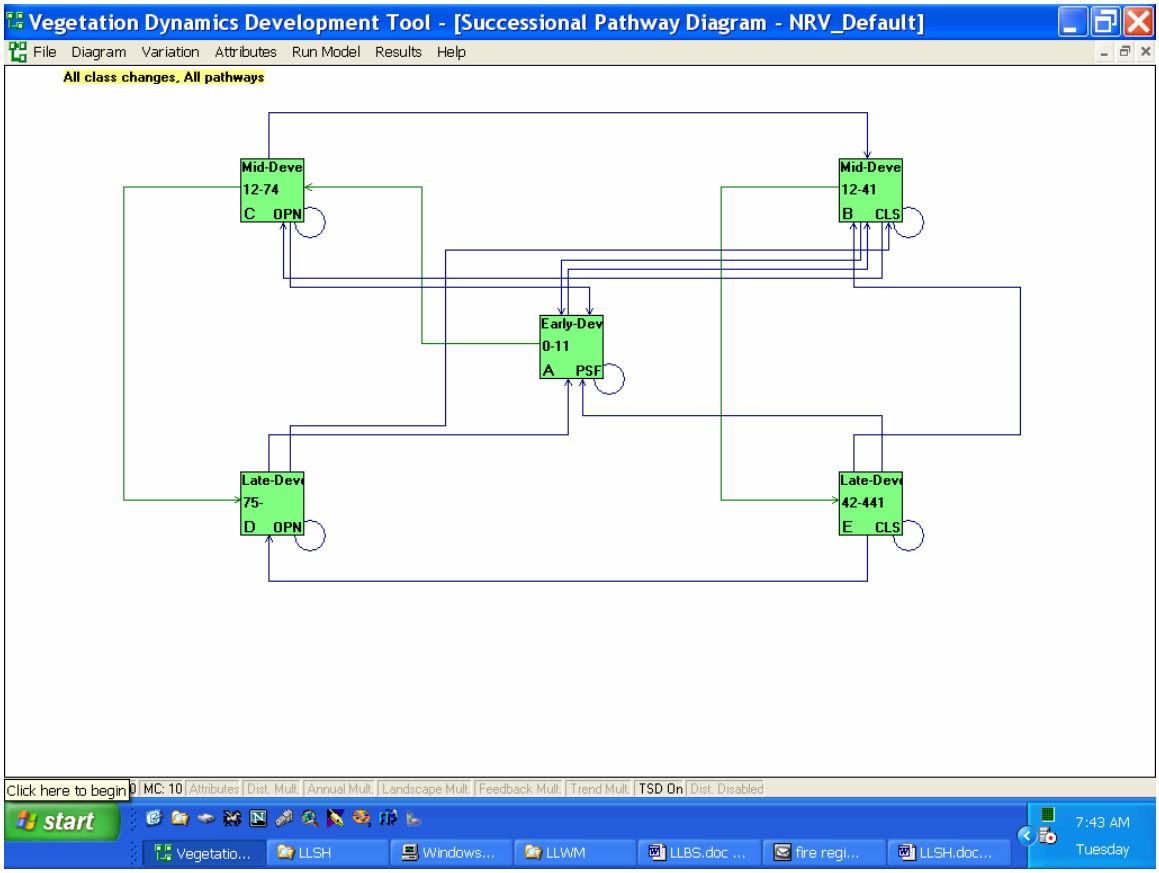
[Discussion of alternative models: The initial group model had a fire probability of 0.4 for the prevailing vegetation, based on a probability of 0.5 for more flammable wet-mesic longleaf/wiregrass. This frequency seems too high, given that the few literature estimates are a bit longer. Christensen says 3-5 years, Wade, et al. (based on Landers) 1-4 years. But 0.5 is more frequent than the midpoint even of the 1-4 year interval. In addition, the presence of vulnerable stages in the life cycle even of longleaf pine, plus the presence of a diverse lepidopteran community that is not resilient to fire, suggests a longer natural fire interval.

The model gave appropriate percentages of successional stage patches using a probability of 0.4 for longleaf pine/bluestem and of 0.5 for wet-mesic longleaf pine. But similarly appropriate percentages can be achieved with a surface fire probability of 0.3 if the time since fire needed to develop the closed path vegetation is increased from 10 to 15 years. While 10 years is often sufficient to create less flammable closed vegetation under current conditions, it is likely that this stage developed more slowly in fire-dominated landscapes that had not experienced a substantial interval of fire exclusion.

VDDT File Documentation

Include screen captures (print-screens) from any of the VDDT graphs that were used to develop reference conditions.

(images for alternative model)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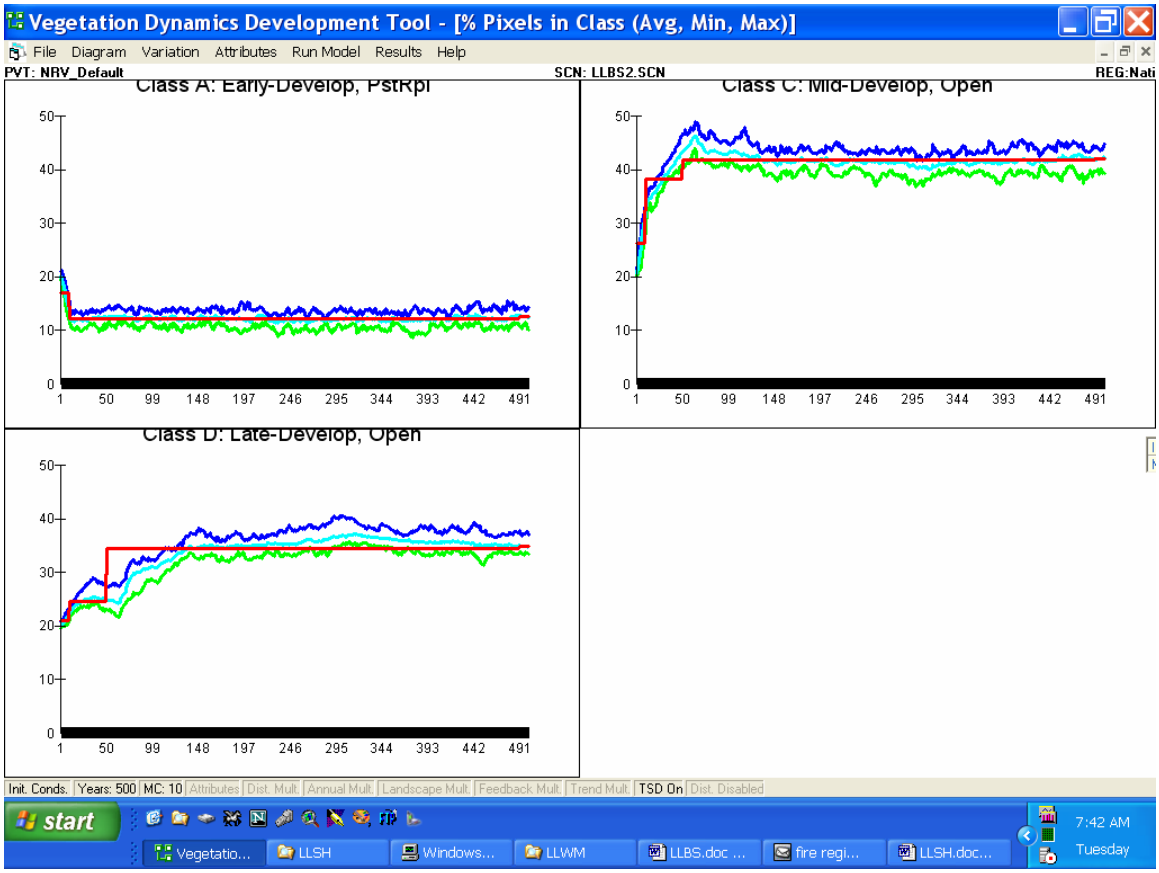
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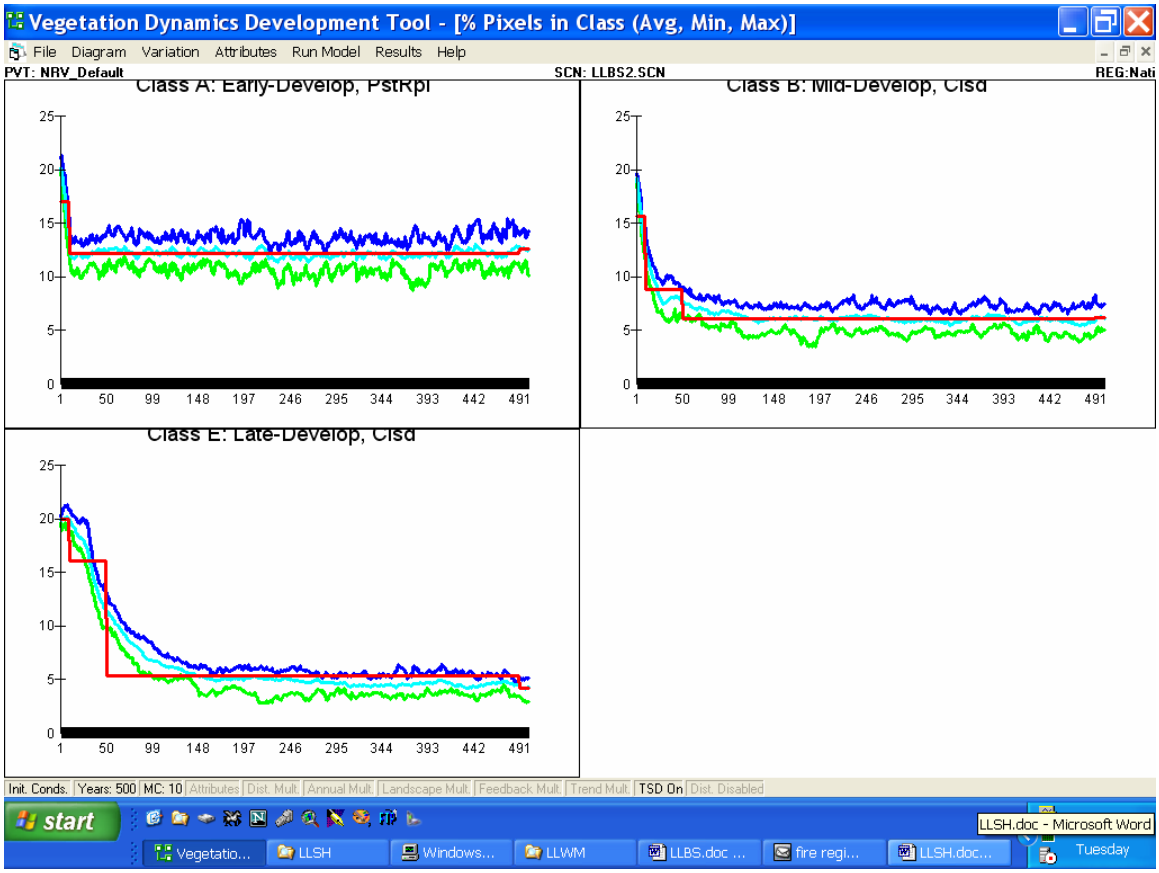
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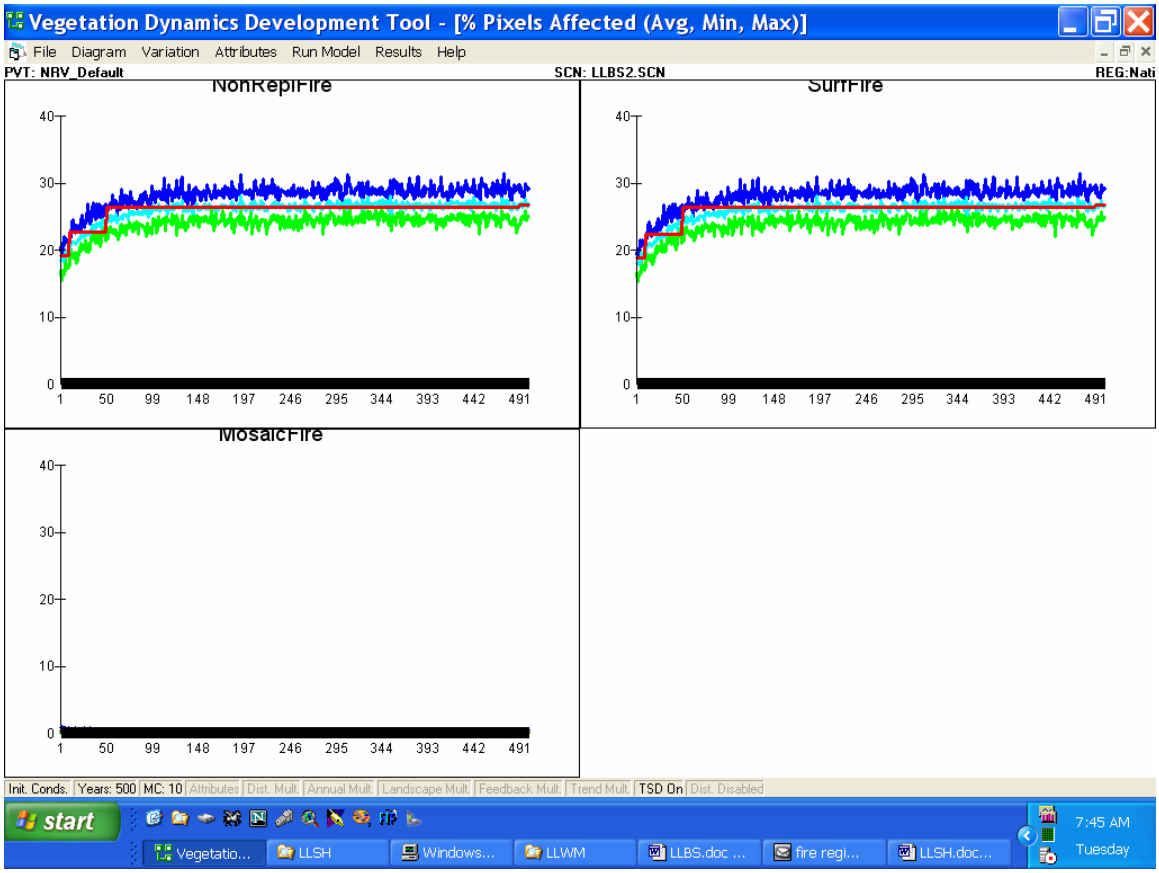
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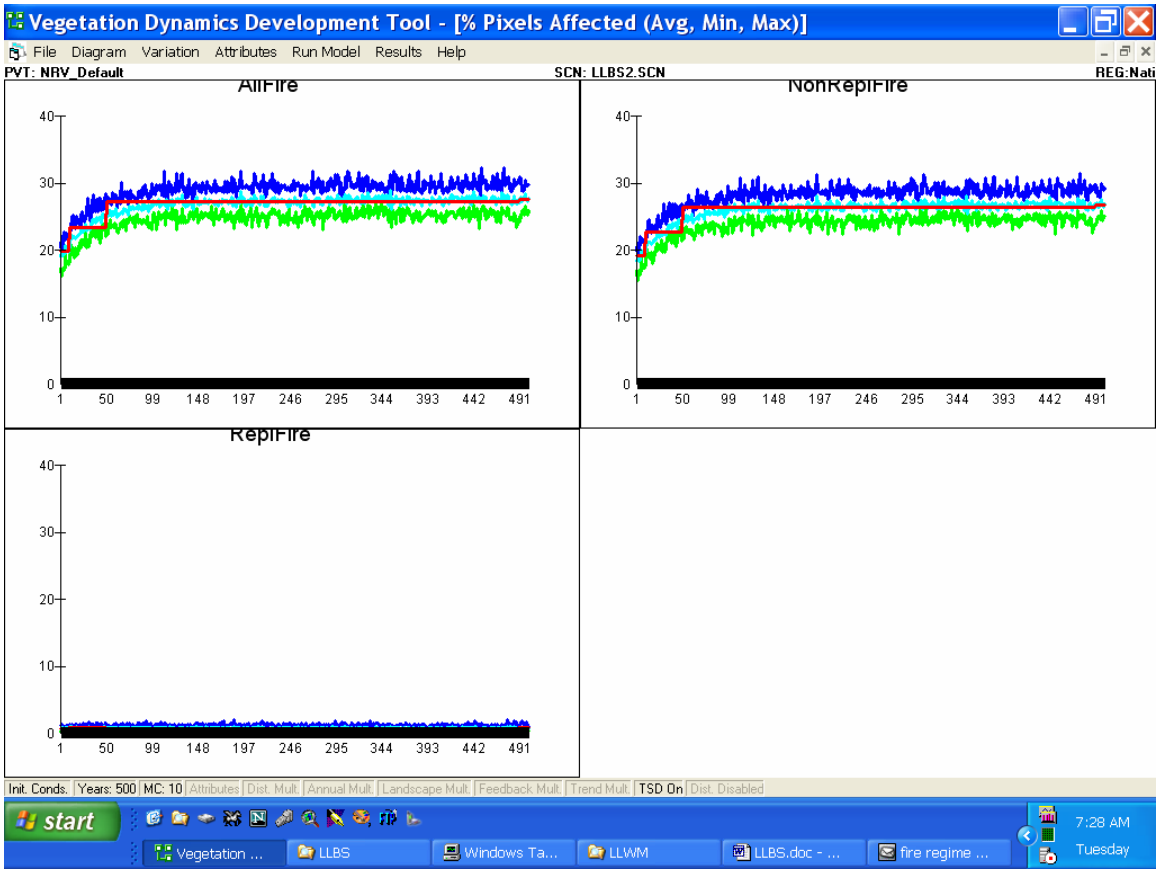
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