

**\*\*DRAFT\*\***

**5/28/04**

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

**Modeler:** Ron Masters

**Date:** 11-22-04

**PNVG Code:** XTMB1

**Potential Natural Vegetation Group:** Cross Timbers

**Geographic Area:** Central parts of Texas, Oklahoma and Kansas

**Description:** Dominated by Post oak (*Quercus stellata*) and to a lesser extent blackjack oak (*Q. marilandica*), in the eastern extent, hickory (*Carya* spp.) and black oak (*Quercus velutina*) may be a constituent and also occasionally elm (*Ulmus americana*). In open conditions the understory and canopy openings are dominated by big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*) and Indiangrass (*Sorghastrum nutans*) and various annual and perennial forbs with prevalence dictated by stand density and overstory canopy cover. In closed canopy conditions, groundcover has little to no herbaceous cover and is dominated by oak leaf litter. Other important woody plants include chittamwood (*Bumelia lanuginosa*), roughleaf dogwood (*Cornus drummondii*), greenbriar (*Smilax* spp.), sumac (*Rhus* spp.) and poison ivy (*Toxicodendron radicans*). Dense structure is found from the lower to upper midstory in closed canopy conditions with persistent branches composing much of structure along with numerous small to medium diameter stems. In the eastern extent, *Vaccinium* spp. may contribute to lower midstory structure in closed canopy stands. The cross timbers is generally found within a landscape matrix of tallgrass prairie.

Historical accounts describe post-replacement shrub-scrub (early coppice) areas of cross timbers in addition to open and closed canopy conditions. The black-capped vireo's historic range was associated with the post-replacement cross timbers vegetation type. Washington Irving and others have described areas of cross timbers that were evidently mid-seral closed and possibly late-seral closed, because of their inability to penetrate the forest on horse back and their description of the branching present in those stands. Yet others describe stands within the cross timbers that were easily traversed via wagon. Based on historical accounts and limited analysis of General Land Office survey data, more closed canopy conditions occurred on the landscape than might be expected for a frequent fire regime.

### **Assumptions:**

Early development or post-replacement stand conditions are assumed to occur within the range of 0-19 years of age for developing canopy trees. Mid-seral stage vegetation occurs in the 20-79 year range with late-seral development from 80 years throughout the remaining life of the stand. The break point for open to closed canopy conditions is considered to be 60% canopy cover. These assumptions were made based on observations of average structural attributes associated with dominant trees in these age groups.

Other major disturbances considered included: wind/weather/climate influences that may cause individual tree or tree group mortality and competition/disease/insects which again may cause individual tree or tree group mortality.

No assumptions are made about bison grazing patterns influencing structure of cross timbers stands.

**Fire Regime Description:** Fire regime group I, with frequent surface fires. Fire frequency is considered to be similar to adjacent forested ecosystems. The limited information available on fire chronologies is supportive of this assumption. Fire regimes are assumed to be a result of

both aboriginal and lightning origin. Fire history studies from southwest Missouri and southeast Oklahoma suggest a mean fire return interval of 3-4 years. Major drought cycles occur at approximately 20 year intervals and may influence periodic stand replacement fire depending on the season of fire. Fires have been reported to occur during and following drought periods. Mosaic fire or mixed severity fire is thought to play some role associated with drought cycles where leaves and grass are the primary fuel for carrying a fire. Surface fires were primarily wind driven fires in open (prairie) conditions over a fuel bed of predominantly grass although occasionally surface fires might have occurred in leaf litter given dry conditions. Historic prairie fires have been noted to slow down or stop at the border of cross timbers vegetation, presumably when leaf moisture was high. Surface fire would penetrate or burn completely through late-seral, open stands.

### Vegetation Type and Structure

Class*	Percent of Landscape	Description
<b>A:</b> post replacement	15	Oak reproduction (often coppice) to 15' tall. Community of forbs and perennial grasses. More persistent on shallow soils. Openings may be small to extensive and have scattered live trees.
<b>B:</b> mid-seral closed	14	Mid-seral with closed canopy (>60%) sapling to pole-sized oak with little or no herbaceous understory. Often coppice origin.
<b>C:</b> mid- seral open	29	Mid-seral woodland/savanna overstory with perennial grasses. Cover <60%.
<b>D:</b> late- seral open	32	Mid-seral woodland/savanna oak overstory with perennial grasses. Cover <60%.
<b>E:</b> late- seral closed	10	Late-seral, closed canopy (>60%) oak dominated overstory community. Little to no herbaceous cover and few shrubs.
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	175	.006	4	Late growing/early dormant season fires occurring in exceptional drought years
Non-Replacement Fire	3.9	.25	96	Primarily surface fire in all classes. Some mosaic fire.
All Fire Frequency*	3.8	.26	100	

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

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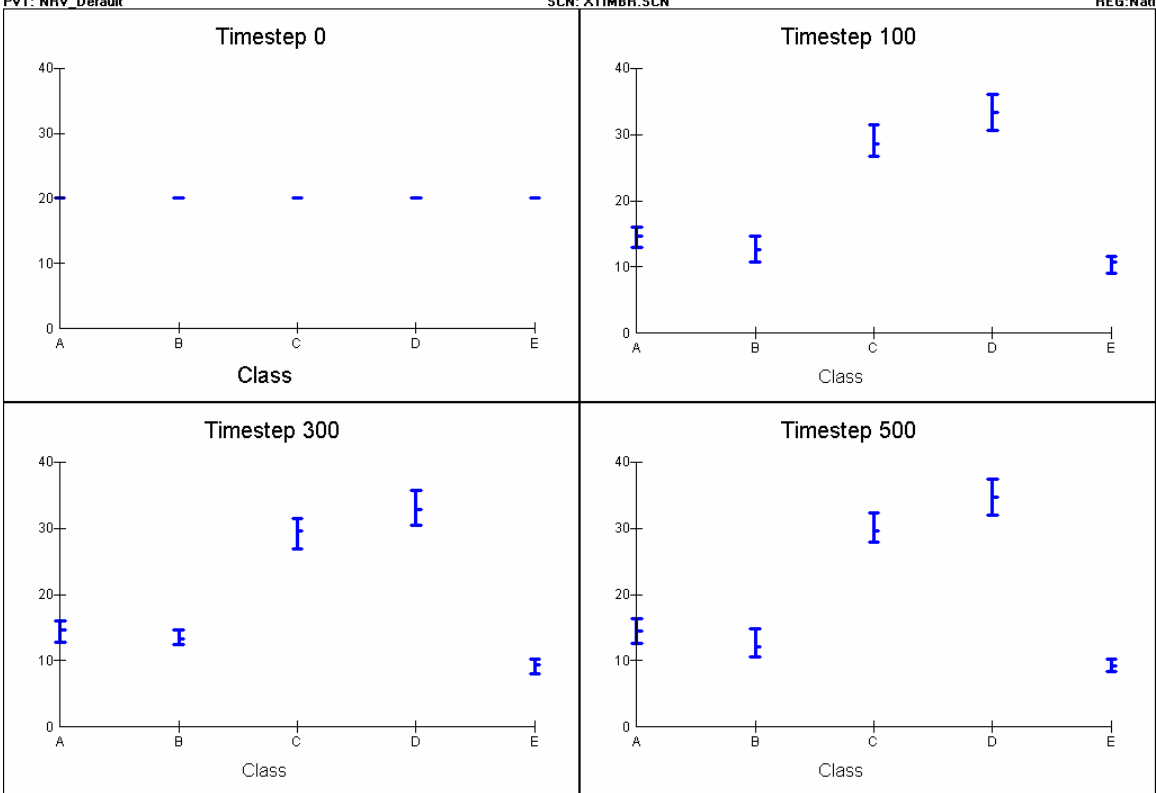
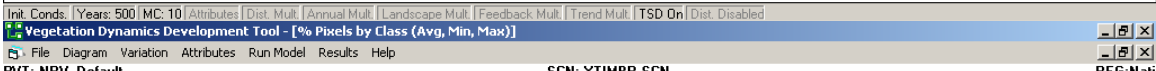
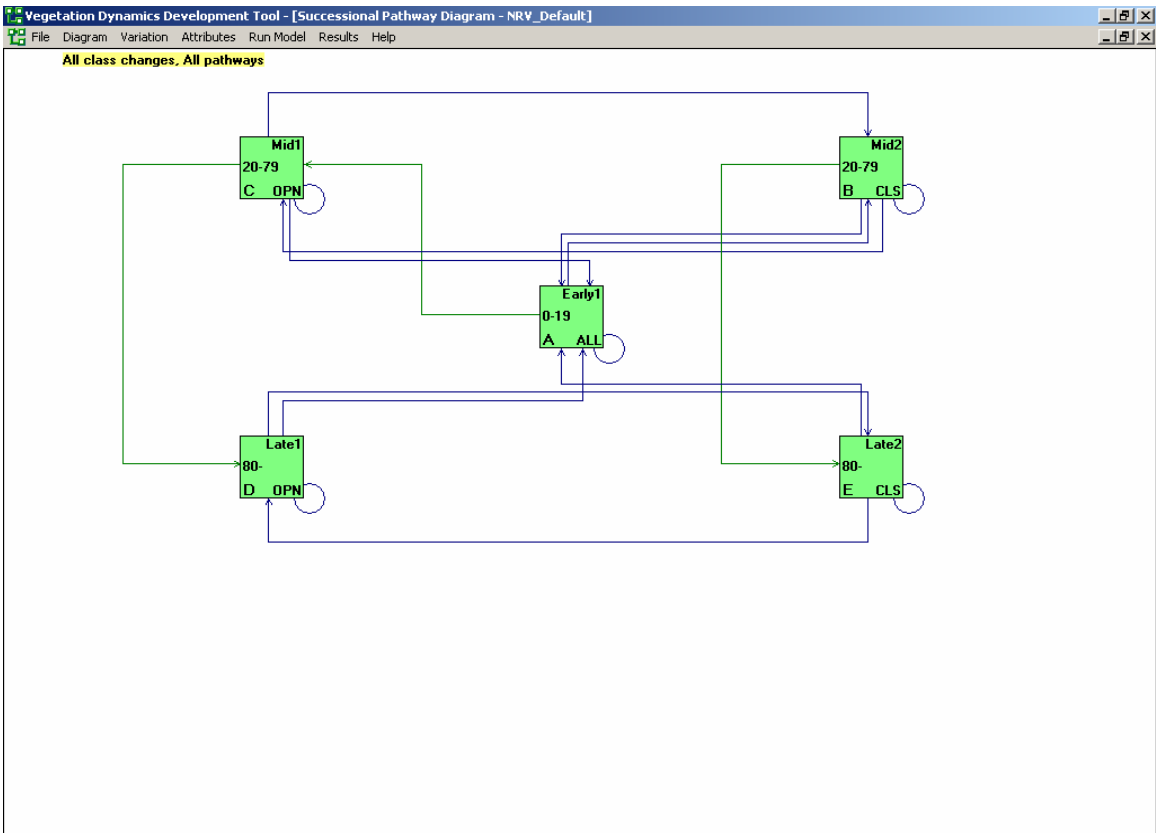
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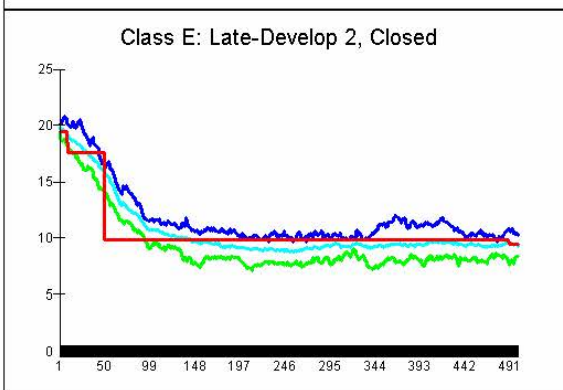
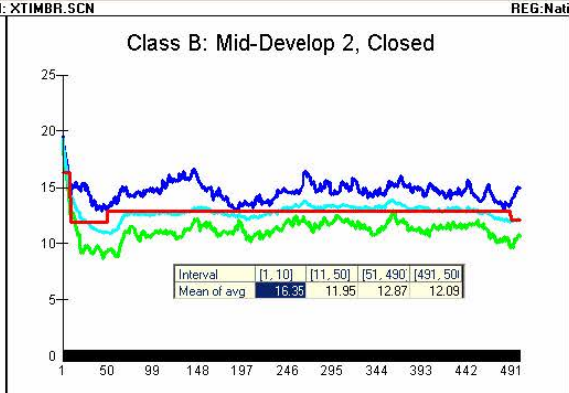
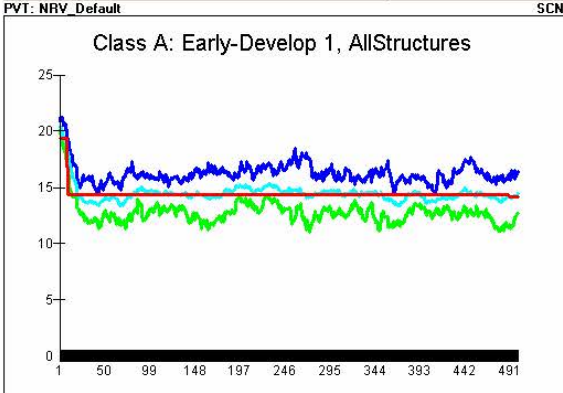
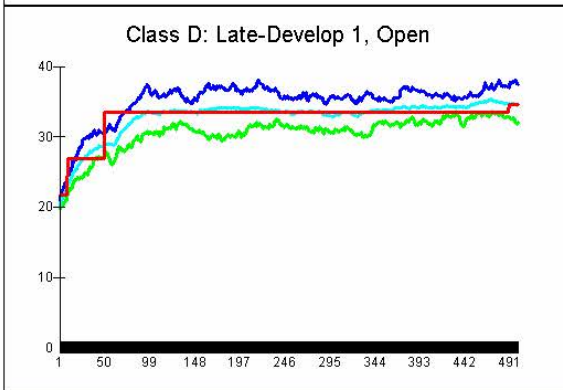
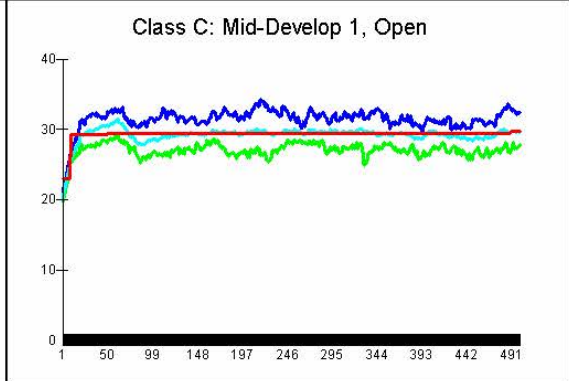
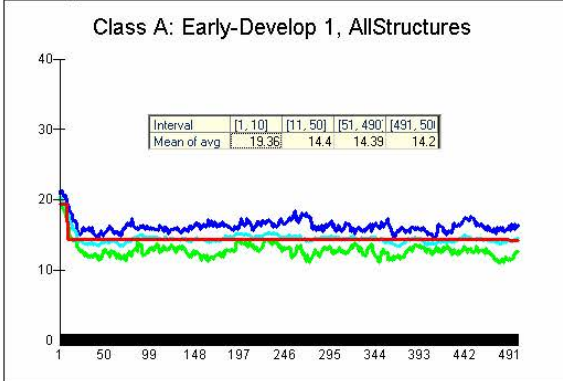
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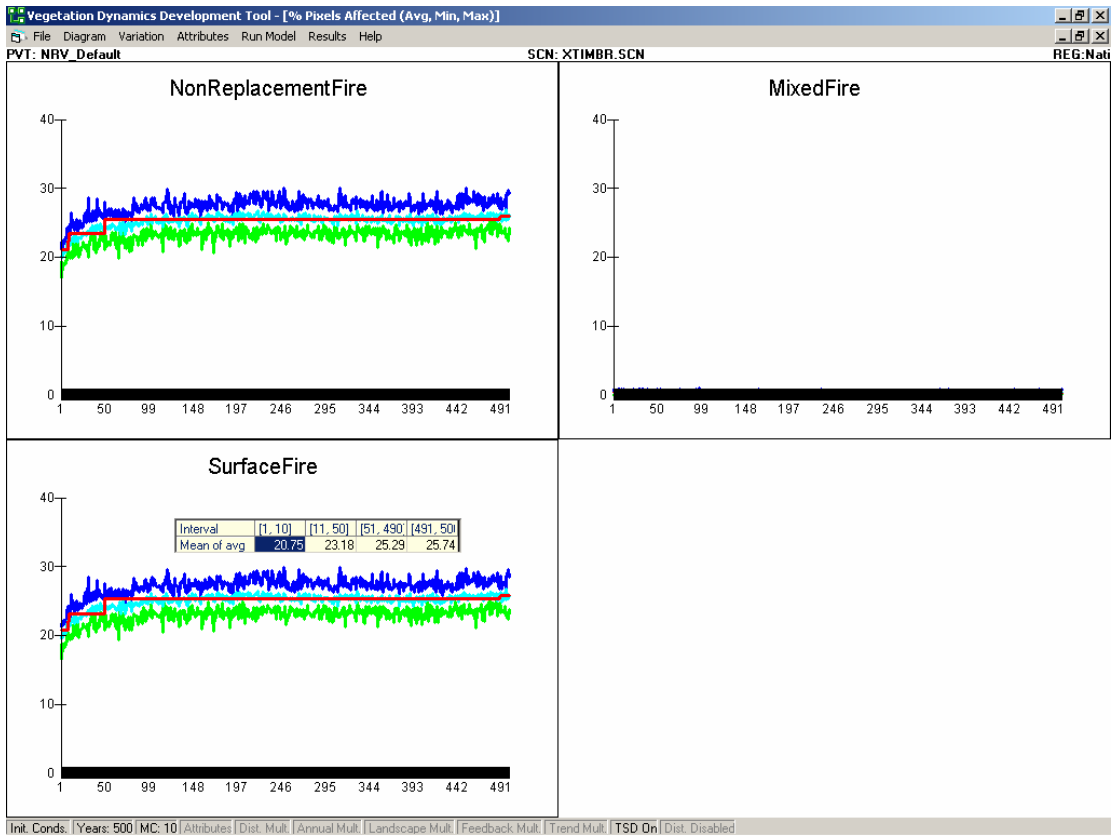
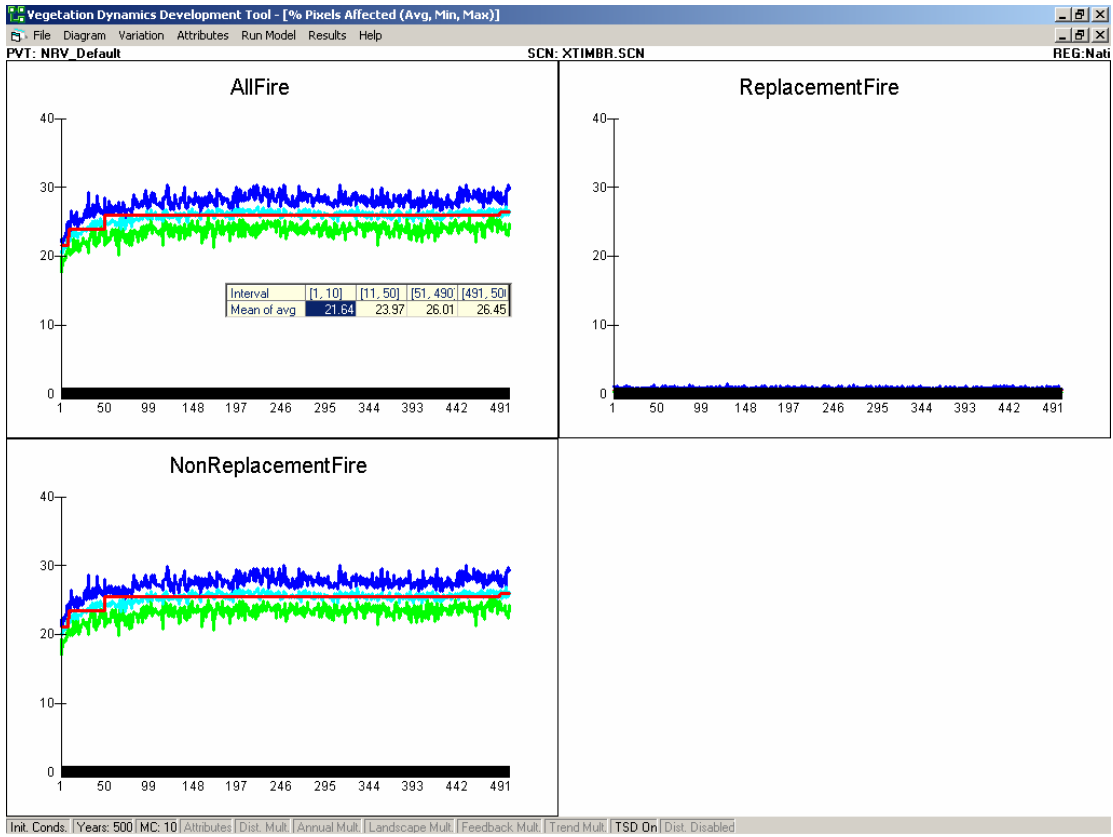
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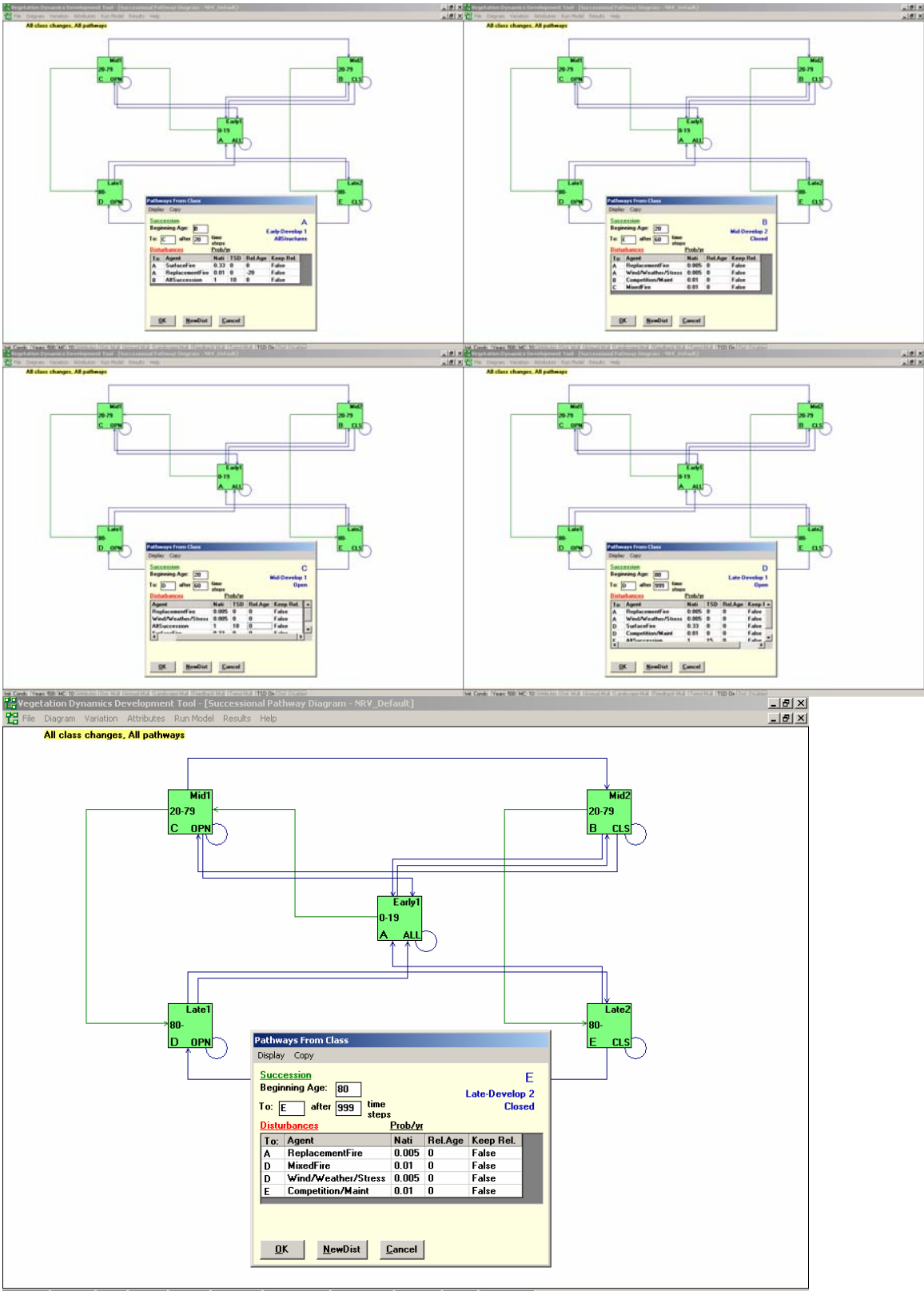
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## Map of Cross Timbers extent in Oklahoma.

