

Fire Regime Condition Class (FRCC) Interagency Handbook Reference Conditions

Modeler: G.Nowacki, M. Thomas-Van Gundy, D. Wallner, R. Guyette, L. Iverson, & T. Hutchinson **Date:** 5/27/04 **PNVG Code:** OKHK4

Potential Natural Vegetation Group: Oak-Hickory Northeast (*tentative title*)

Geographic Area: Eastern Nebraska/Oklahoma to Central Michigan/Tennessee.

Description: The oak-hickory (Kuchler PNV 100) historically occurred on moderately well to well drained uplands within east-central United States. Much of this area is located south of the "Prairie Peninsula" where topography was more dissected and fires burned with less intensity, hence allowing forested conditions to prevail.

Definitions of vegetation types were based on Anderson and Anderson (1975) work.

Prairie: < 0.5 trees/ha; < 10% canopy cover.

Savanna: 0.5-47 trees/ha; 10-25% canopy cover.

Woodland: 47-99 trees/ha; 25-60% canopy cover.

Forest: >99 trees/ha; > 60% canopy cover.

The term "grub" is based on Curtis (1959). It refers to a vegetation class maintained by a fire regime whereby trees regenerate but are held in an early structural state (seedling sprouts, root sprouts, & saplings) by recurrent fire. Often, old oak and hickory root systems develop, continually producing sprouts that are ephemeral in nature due to fire top-kill.

Oak-hickory forests and associated seral stages were fire-maintained, and would readily succeed to sugar maple in the absence of fire. A mosaic of vegetation types comprised oak-hickory landscapes contingent on fire history (Cutter and Guyette 1994). Pyrogenic vegetation types, in order of decreasing fire frequency/intensity, include grassland prairie (fire return of ≈2 yrs), oak-hickory grubs and young regenerating stands (3-9 yrs), oak-hickory savannas and woodlands (5-15 yrs), and oak-hickory forests (15-30 yrs).

Native Americans played a critical role in the development and maintenance of oak-hickory landscapes through fire ignition, as lightning-strike ignitions were limited. Natives burned these landscapes for a variety of reasons. Fire encouraged open habitats which, in turn, increased food-producing plants (forbs, mast) and ungulate herbivores (meat). Mixed (maple-dominated) forests were relegated to those areas where fire was restricted, often associated with mesic coves, wetter depressions, and lee-sides of natural fire breaks (e.g., rivers and lakes). Prolonged lengths of time (100 to 150 yrs) were needed for maple dominance to manifest.

Fire Regime Description: The oak-hickory PNVG is predominantly fire regime I characterized by low-severity surface fires. Indigenous fires accounted for over 95% of the ignitions over these landscapes. Vegetation types varied based on fire frequency and intensity. Grassland prairies burned often (annually, biennially) and were probably associated with flat-to-slightly rolling terrain that effectively carried fire. These grasslands, deliberately maintained by Native for hunting purposes, were probably scattered throughout the forest matrix. Oak-hickory grubs (tree-sprout and shrub thickets) occurred where fire frequency was a bit less, probably 3-9 yrs. Also, grub conditions would arise immediately after catastrophic burns that would top-kill tree-dominated communities. Savannas and woodlands developed within a moderate burning regime, with fire return times averaging every 5 to 15 yrs. Closed-canopy oak-hickory forests would develop where fire return intervals stretched beyond 15 years. Shade-tolerant, fire-sensitive maples (and associate late-successional trees) would regenerate and form understories beneath oak-hickory canopies when fire was excluded over several decades. With continued fire exclusion, maple

and other late-successional species would gradually replace overstory oaks and hickories through gap capture (Sutherland and Hutchinson 2003).

Vegetation Type and Structure

Class*	Percent of Landscape	Description
A: early seral - prairie	2	Grassland prairie maintained by frequently recurring fire (1-2 yrs) age class-0-1 years
B: early seral - grubs	6	Early tree regeneration (root and stump sprouts) phase; fire frequency about 3-9 yrs. Age class – 2-9 years
C: mid-seral open – savanna & woodland	34	Oak-hickory savannas and woodlands. Fire return interval of 5-15 yrs. Age class- 10-299+ years
D: late- seral – oak forest	54	Oak-hickory forests. Fire-return interval of 15 to 30 yrs. Open understories of oak seedlings exist. Age class – 50+ years
E: late- seral – maple forest	5	Mixed (maple) forests develop during the absence of fire. Dense understories of shade-tolerant species develop. Age class – 150+ years
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	50	.02	22	Occurs primarily in A and B
Non-Replacement Fire	14	.07	78	Maintains C and D
All Fire Frequency*	12.5	.09	100	

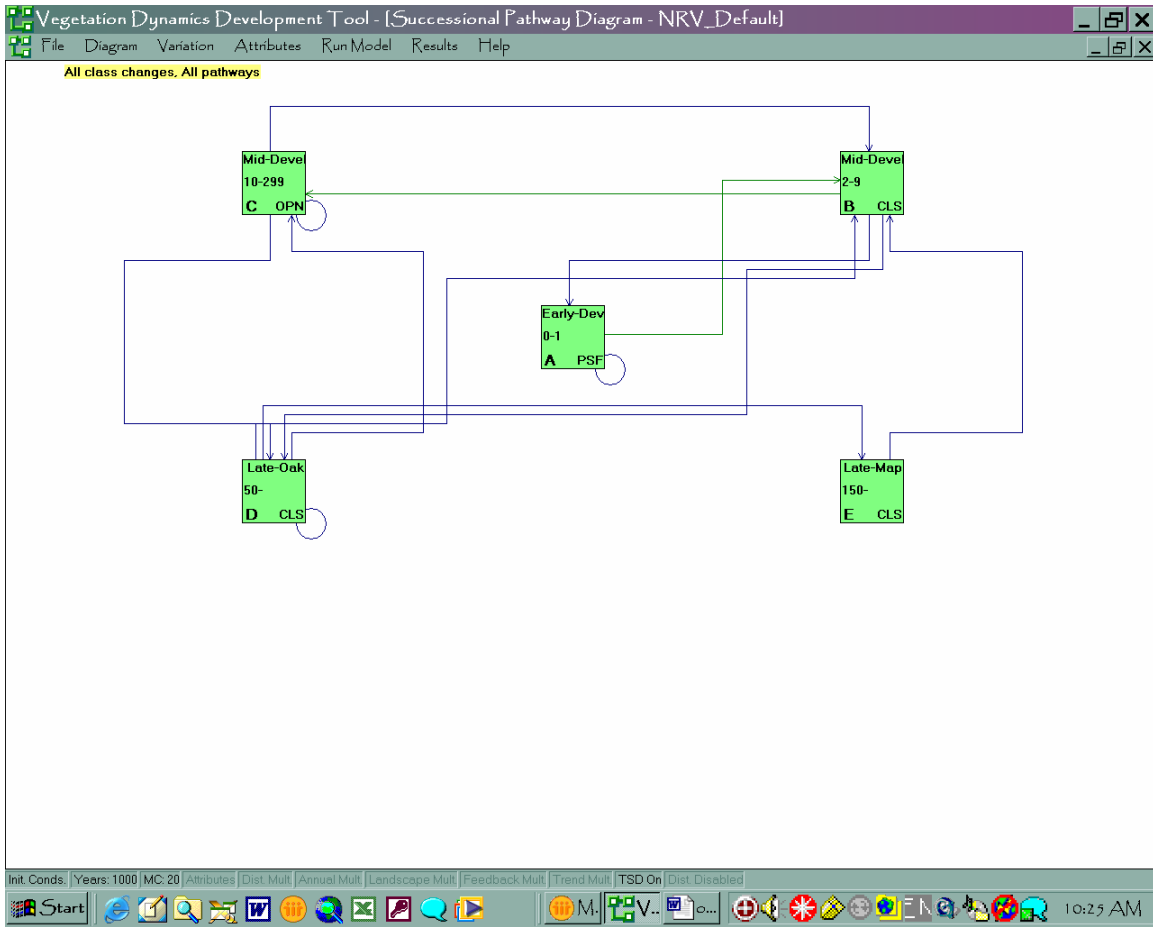
*All Fire Probability = sum of replacement fire and non-replacement fire probabilities. All Fire Fire Frequency = inverse of all fire probability (previous calculation).

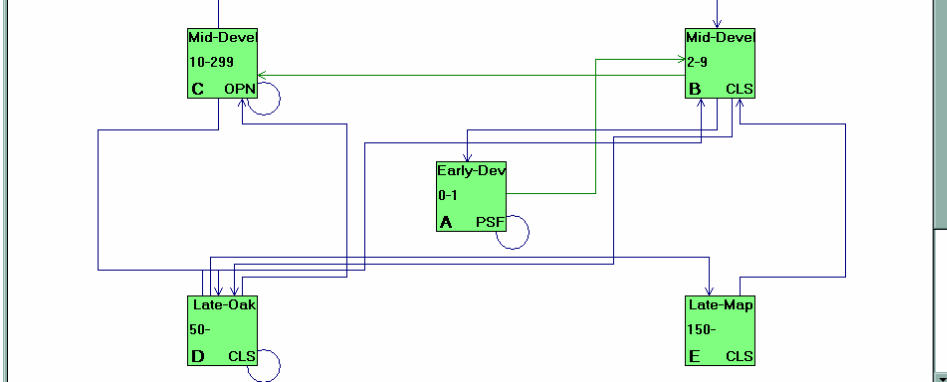
References

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PERSONAL COMMUNICATION (if applicable):

VDDT File Documentation





Ending Conditions

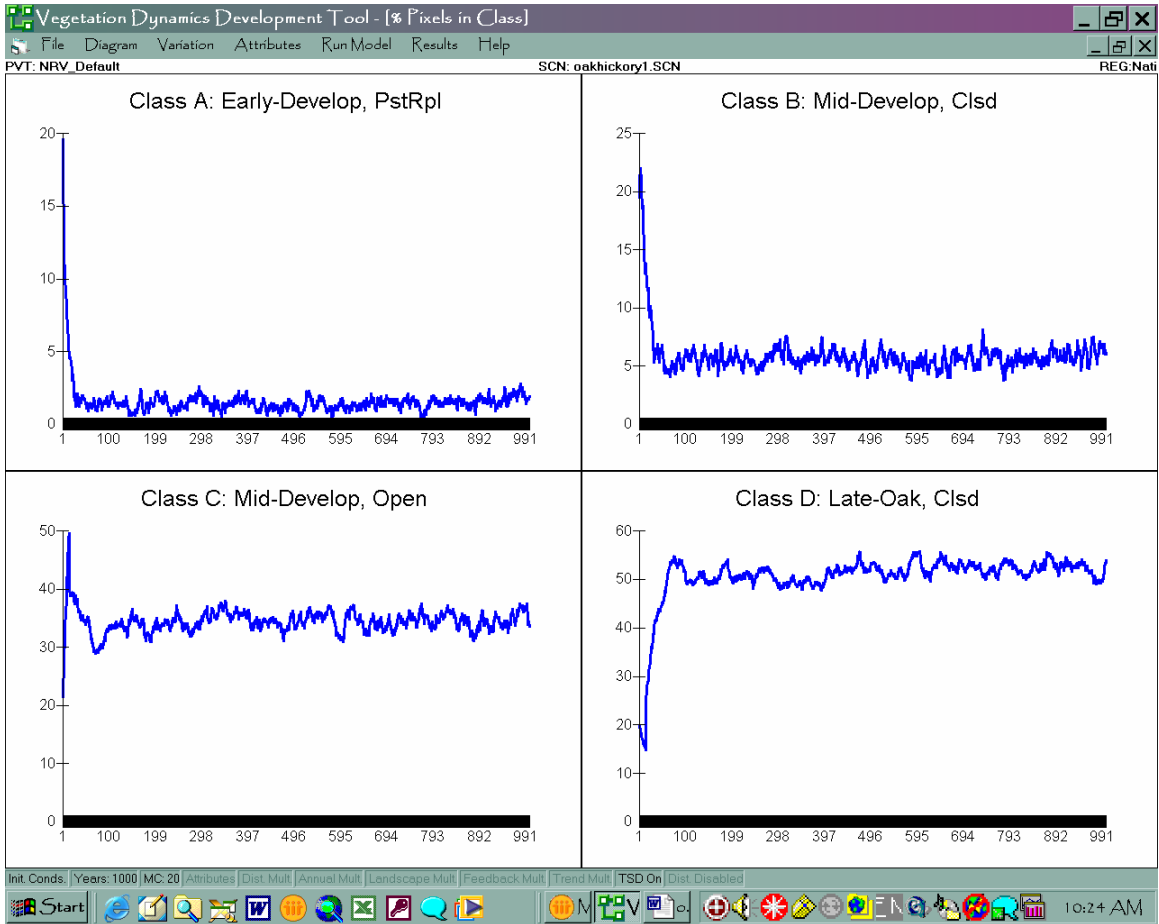
Ending Conditions by Class

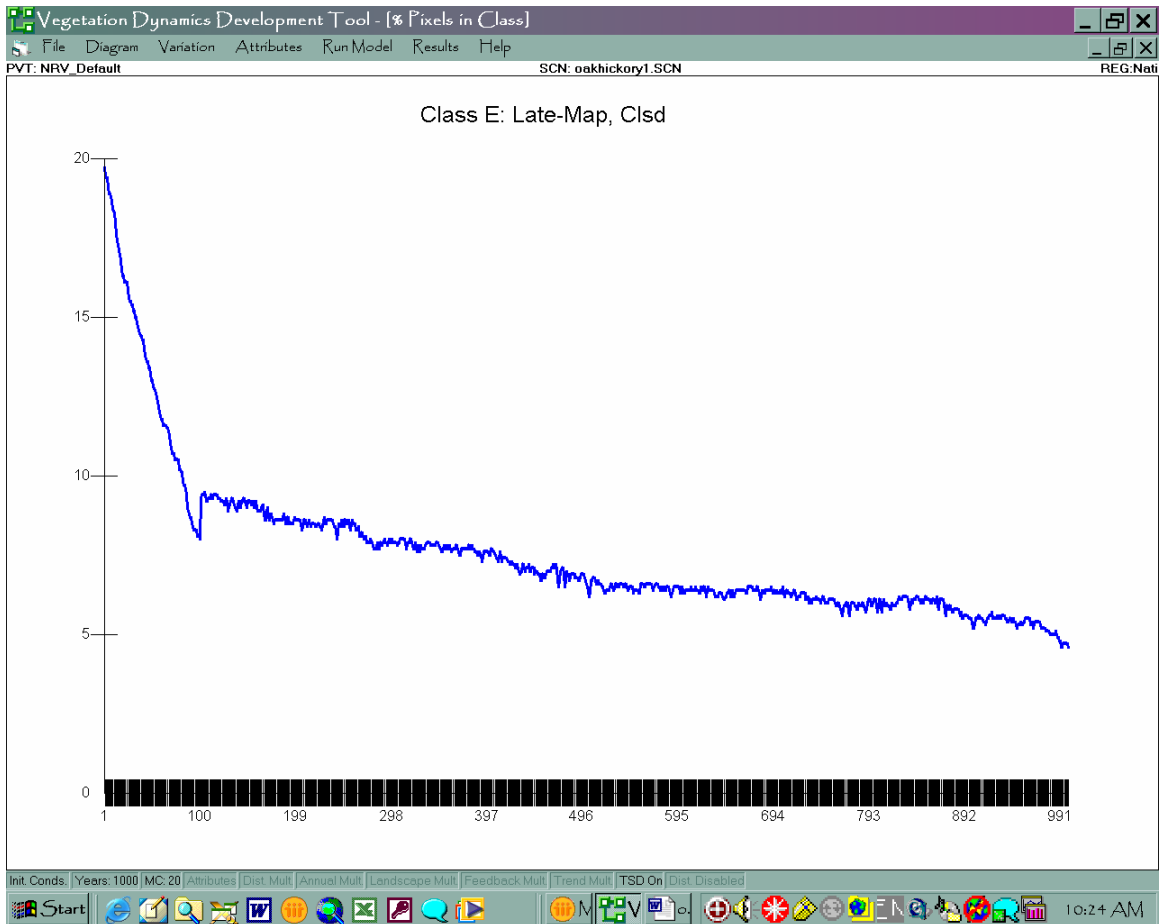
	Col 1	Col 2	Col 3	Total
Row 1	C 0.336	A 0.019	B 0.06	0.396
Row 2	D 0.539	E 0.046		0.585
Total	0.875	0.019	0.106	1.

Close

Status

PVT: NRV_Default
 SCN: oakhickory1.SCN
 REG:Nati
 PRJ:
 Unmodified





SCN: oakhickory1.SCN

1 NRV_Default

A 1 PstRpl 1001 Early-Develop

Succession: B 1

A 1003 ReplFire 0.8 0 1 -2

B 2 Clsd 1002 Mid-Develop

Succession: C 7

A 1003 ReplFire 0.05 2 9 0

D 1152 ClsdPath 1 2 9 0

C 3 Open 1002 Mid-Develop

Succession: C 289

B 1003 ReplFire 0.01 10 299 0

C 1001 SurfFire 0.1 10 299 0

D 1152 ClsdPath 1 10 299 0

D 2 Clsd 1004 Late-Oak

Succession: D 998

B 1003 ReplFire 0.005 50 1048 0

C 1002 MosaicFire 0.015 50 1048 0

D 1001 SurfFire 0.05 50 1048 0

E 1152 ClsdPath 1 50 1048 0

E 2 Clsd 1003 Late-Map

Succession: E 998

B 1003 ReplFire 0.001 150 1148 0

B 1155 WindWethStres 0.007 150 1148 0