

Fire Regime Condition Class (FRCC) Interagency Handbook Reference Conditions

Modeler: Ron Masters

Date: 12-27-04

PNVG Code: PRAR7

Potential Natural Vegetation Group: Bluestem-Sacahuista Prairie (Kuchler Type 77) also known as the Coastal Prairie.

Geographic Area: Along the Gulf Coast and inland varying distances from 50 to 150 miles (80-240 km) from south Texas to Louisiana and the mouth of the Mississippi River (see map). To the north this type is bordered by Oak-Hickory forest (Kuchler type 100) in much of Texas and in east Texas Oak-Hickory-Pine (Kuchler type 111) and in Louisiana to the north and east by Southern Floodplain Forest (Kuchler type 112) (Kuchler 1964). To the south and west it also joins with the desert grasslands. This type is dissected by numerous rivers and streams.

Description: This type has many of the same vegetation elements of tallgrass prairie but also has a number of additional species, including some tropical grasses. Nearly 1,000 plant species have been identified in this type. The forb community tends to be richer in the coastal prairie than in true tallgrass prairie. This type is considered a shrub-grassland complex rather than a prairie (Johnston 1963, Scifres and Mutz 1975, Drawe 1994). This type is highly variable in species composition because of the dissected nature of the terrain and topography caused by numerous rivers and creeks (Johnston 1963, Diamond and Smeins 1985, Drawe 1994). Dominated by little bluestem (*Schizachyrium scoparium*), sea coast bluestem (*S. c. var. littoralis*) several *Panicums* and sacahuista also known as Gulf cordgrass (*Spartina spartinae*). Sacahuista primarily dominates along floodplains of the numerous rivers and near the coast. Other important species include bushy bluestem (*Andropogon glomeratus*), other bluestems such as split-beard (*A. ternarius*), broomsedge bluestem (*A. virginicus*), silver bluestem (*Bothriochloa saccharoides*), various *Sporobolus*, and several tropical grasses of the genera *Heteropogon*, *Paspalum*, *Trachypogon* and the previously mentioned *Panicum*.

A topographic and moisture gradient exists as one progresses inland and out of floodplains. Species associations change with edaphic and moisture conditions. Secondary species vary in importance regionally depending on topography and soil moisture relations and include sideoats grama (*Bouteloua curtipendula*), buffalo grass (*Buchloe dactyloides*) and threeawns (*Aristida* spp.). Several grass-like species that are important include *Carex* spp., *Eleocharis* spp., *Scirpus* spp. Conspicuous forbs include the genera *Ratibida*, *Rudbeckia*, *Liatris*, and *Sagittaria*. Shrubs that are important include in honey mesquite (*Prosopis glandulosa*) and various acacias most notably huicache (*Acacia farnesiana*) in Texas, also *Rosa bracteata*, and various oaks (*Quercus* spp). Eastern baccharis (*Baccharis halimifolia*) and wax myrtle (*Myrica cerifera*) are more important to the east. All of these woody plants and others increase in the absence of fire.

Bison (*Bison bison*) were historically an important source of disturbance that increased heterogeneity of patches on the landscape. Wild horses were established early on and large herds were noted by early explorers in the southern part of this type (Stewart 2002). Pronghorn antelope historically occurred in the southwestern most part of this type (Nelson 1925) where rainfall amounts dropped considerably. Although historical accounts of large groups (1,000's) of bison do occur, they evidently were not of the magnitude of herds in central and northern parts of the continent. The diversity of embedded edaphic and wetlands within the general type is important and interacted with fire to determine wildlife species distributions. A problem with much of the literature on fire in prairies, and therefore a caution, is that it does not include interaction with herbivory (Engle and Bidwell 2001). Extended inundation in areas referred to as lagunas adds a disturbance element within 25 km of the coast. These areas are subject to a different successional pattern than that following other types of disturbance (Scifres and Mutz 1975).

Fire Regime Description: Fire regime group II, with frequent replacement fires, both lightning and anthropogenic in origin (Stewart 1951, Lehmann 1965, Drawe 1980, Stewart 2002; Journey et al 2004). Likely, this type has one of the most frequent fire regimes in North America. Annual burning was described in references to historic accounts (Stewart 1951, Chamrad and Dodd 1973, Stewart 2002:141-144) and in one instance reference was made to burning twice (summer and winter) in the same year (Lehmann 1965:133). These references do not indicate every acre was burned every year but likely some considerable area was burned every year with most of the type being burned at least biannually and some areas burned twice in a given year. Lehmann (1965) also notes accounts about the patches of unburned vegetation and relative green-up compared to burned areas. Fire was likely possible during most seasons and dependant on the availability of dry fine fuels sufficient to carry a fire. Historic accounts from the 1800's depict large burns, but the terrain is dissected by numerous rivers and creeks bordered by trees (Lehmann 1965, Drawe 1994). Therefore this landscape matrix strongly influenced the probable size of burn. Within this matrix bison herds had some influence although herds were of smaller size and more dispersed than herds of the central Great Plains. Bison grazing affects fire patterns and thus the landscape patterns in tallgrass prairie (Risser 1990) and assuredly this system as well. Bison and other grazing/browsing wildlife species preferentially seek out the new growth of recently burned areas affecting patch composition (e.g., Coppedge and Shaw 1998, Jackson 1965, Risser 1990, Steuter 1986, Fuhlendorf and Engle 2004). Burn accounts are in agreement with the patch burn model where small burns are preferentially grazed by bison. Using the fire/bison interaction model first proposed by Steuter (1986) recent modifications propose that anywhere from 1/6 to 1/3 of a 20,000 acre (8,094 hectares) tallgrass landscape likely burned (Fuhlendorf and Engle 2004). Likely this figure is less for coastal prairie because of the dissected terrain. Burning causes earlier green-up and increased nutrient content of native grasses and is preferentially selected by grazing animals (Lehmann 1965, Oefinger and Scifres 1977). Typically following green-up, fire is followed by intensive bison grazing pressure to the point that structural classes shifted over the landscape in response to an interaction between bison grazing pressure and fire (Steuter 1986; Fuhlendorf and Engle 2001, 2004). Heavily grazed and trampled areas would not burn in the next year to three years creating a one-way closed path. Following this type disturbance the patches are dominated with forbs and will not burn in the succeeding dormant and growing season because of lack of fuel. Whereas previous years unburned post-grazing re-growth would be the next patch to burn. Bison grazing influenced fire return intervals. Fire occurrence in turn influenced bison grazing distribution. This model depicts a landscape composed of a continuously shifting mosaic of patches with a short time period of duration. The small patch burn and very frequent fire scenario is essential to perpetuate suitable lek sites and brood rearing habitat for Attwater's prairie chicken (*Tympanicus cupido attwateri*) in this system with long growing seasons, fertile soil and quick recovery time and with habitat requirements (Kessler 1978) similar to other prairie chicken species noted by Sparks and Masters (1996). This species historically occurred as somewhat discrete populations in parts of the blackland prairie and coastal prairie (Lehmann 1965, Chamrad and Dodd 1973, Silvy and Hagen 2004, Silvy et al 2004). Frequent fire is essential to control woody dynamics in this dissected landscape mosaic of rivers and creeks with stringers of bottomland and some upland forests (Denevan 1992; Lehmann 1965, Stewart 1951, 2002) and varying edaphic and moisture conditions (Scifres and Mutz 1975).

Vegetation Type and Structure

Class*	Percent of Landscape	Description
A: post replacement	26	Post fire community that is short duration (often weeks- depending on time of burning) before transitioning into one of the other community stages. Succession post inundation with water proceeds in a different manner through a sedge then bunchgrass stage.
B: mid-seral closed	39	Mixed forb and grass community either somewhat recovered from bison grazing, or inundation with water or continuing post burn development. Can be somewhat forb dominated with a woody component in areas.
C: mid- seral open	21	Forb dominated site with sparse bunchgrass clumps, derived from heavy bison grazing and trampling pressure, wallowing and horning, or inundation with water.
D: late- seral closed	14	Tallgrass dominated but with a persistent woody component, tillering and overall plant vigor reduced by mulching effect from accumulation of ungrazed, unburned plant litter, over short periods of fire exclusion woody encroachment will rapidly occur. The woody element will also increase following drought and over-utilization of herbaceous plants.
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	3.6	0.28	78	Surface fire during most any season. Some areas may have burned twice in a given year.
Non-Replacement Fire	12.5	0.08	22	Fires that incompletely burn a given patch because of either wet or unavailable fuels from flooding in poorly drained depressions or as a result of drought and over-grazing thus limiting fuels
All Fire Frequency*	2.8	0.36	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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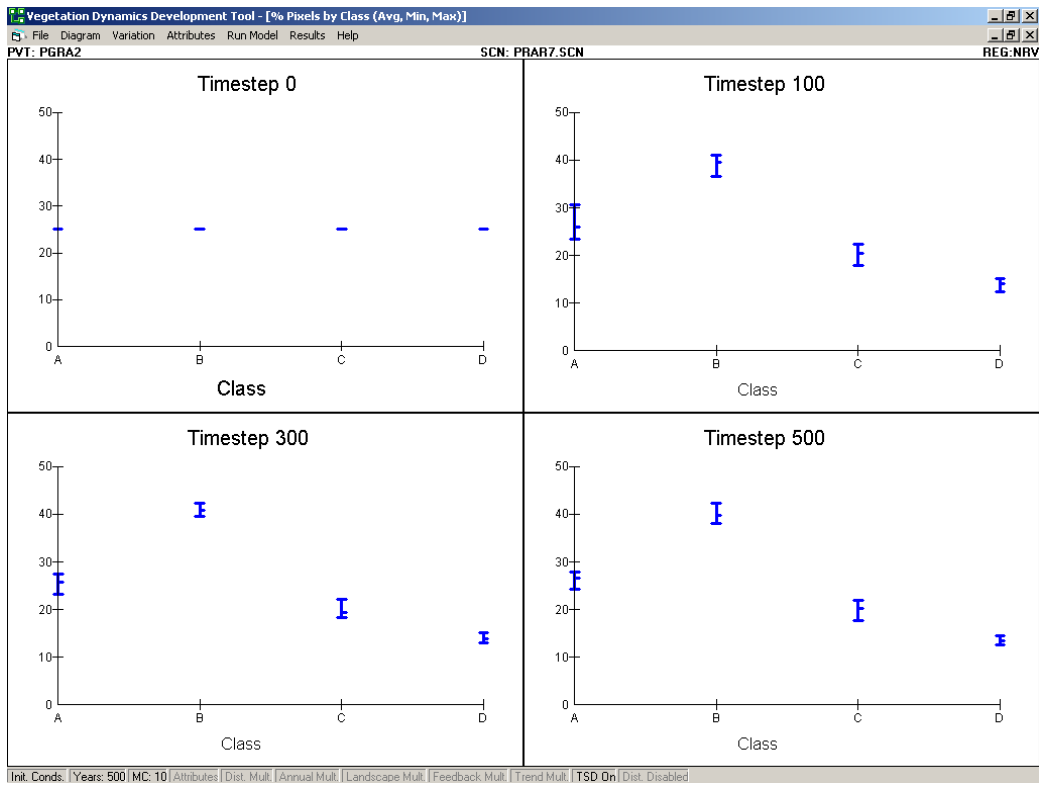
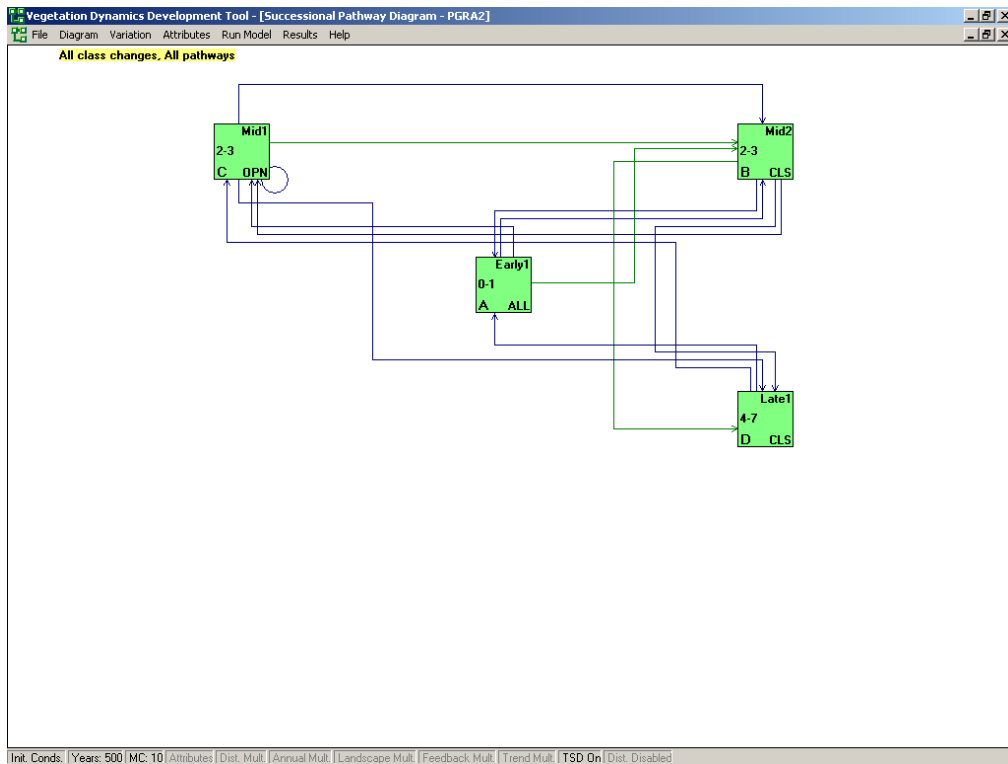
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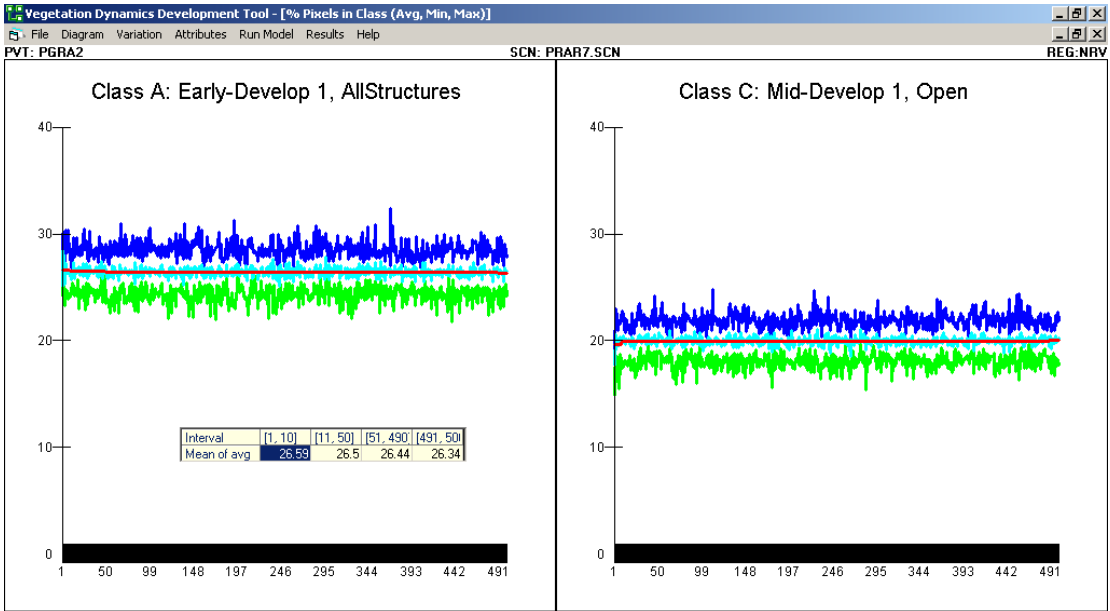
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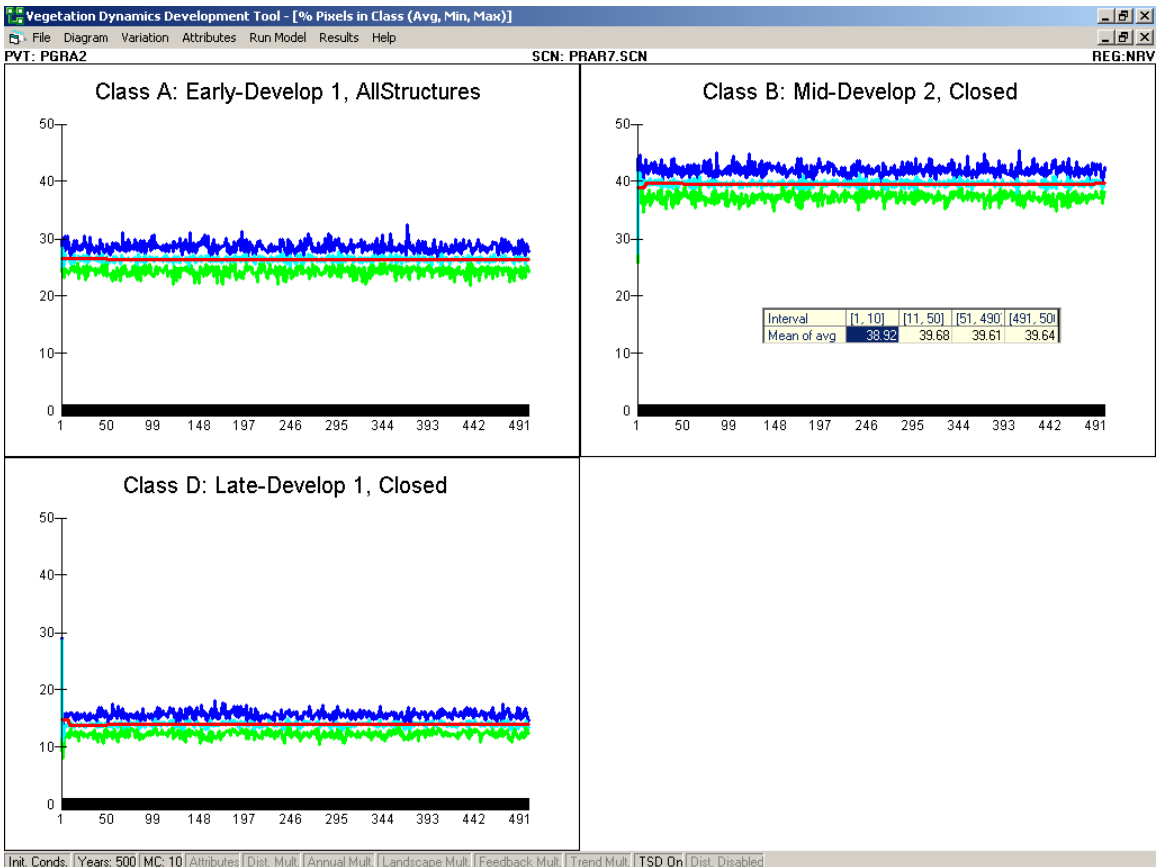
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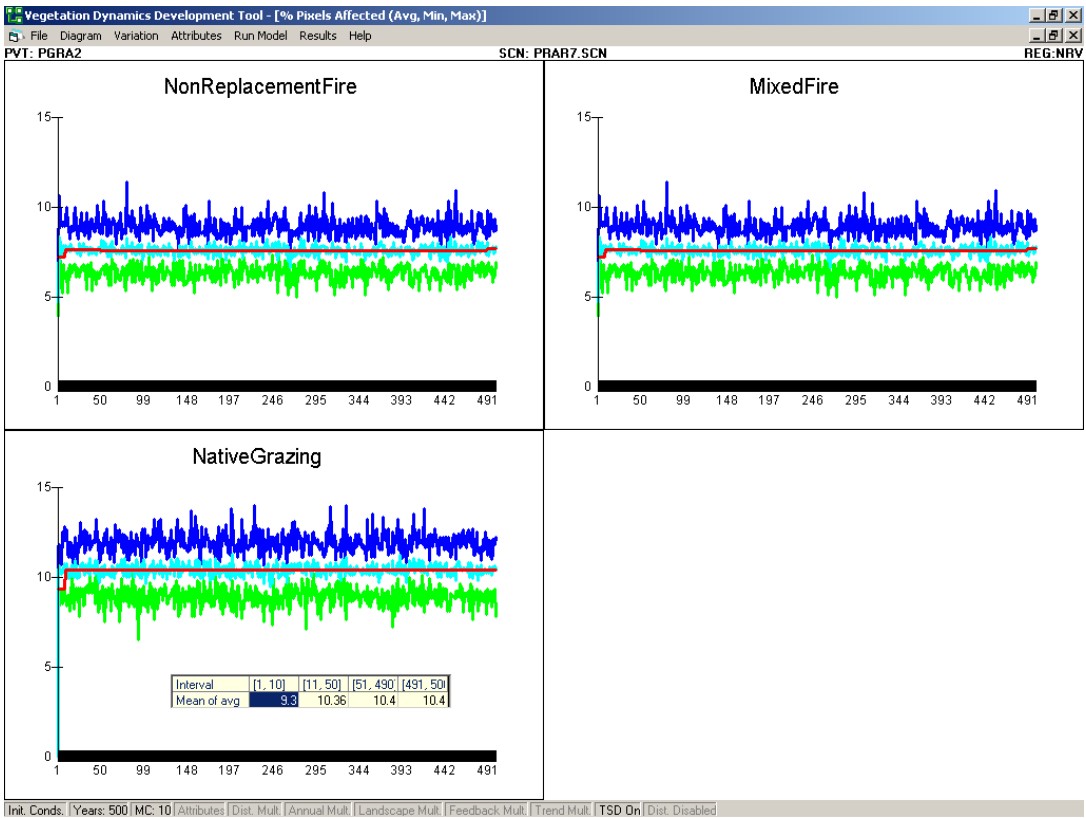
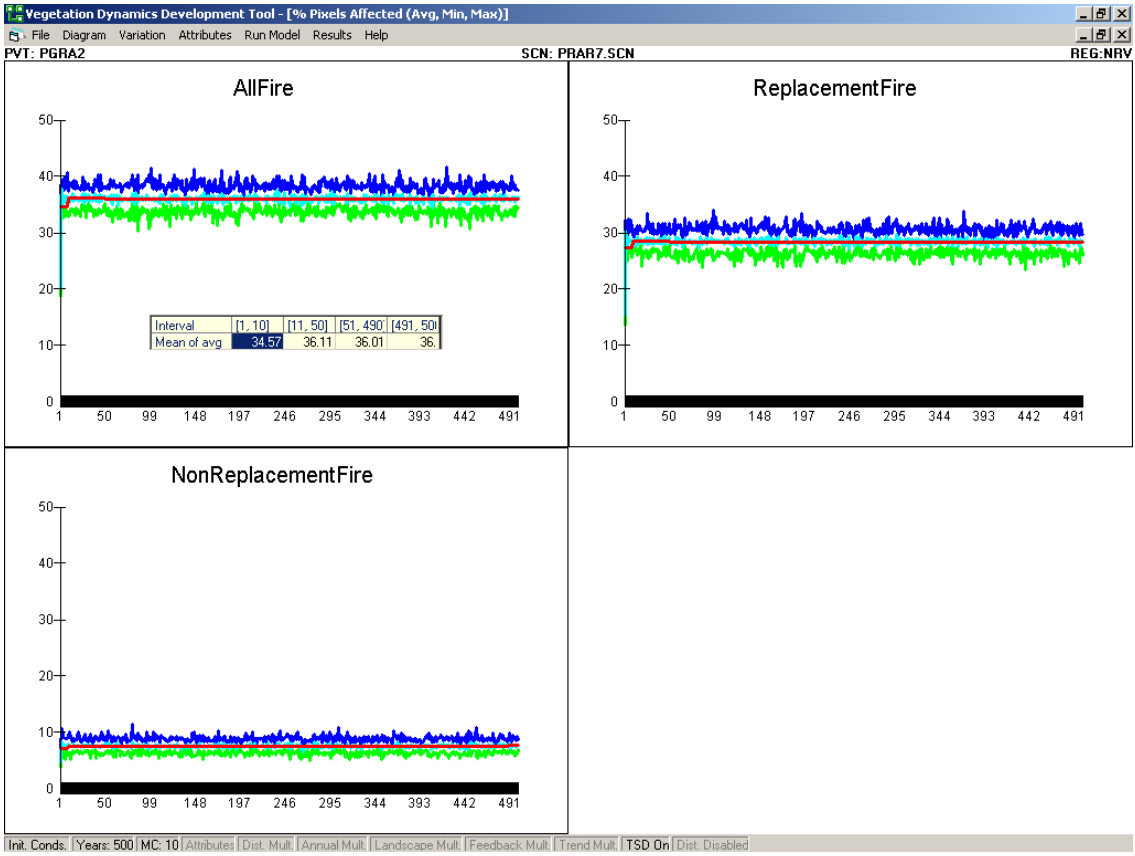
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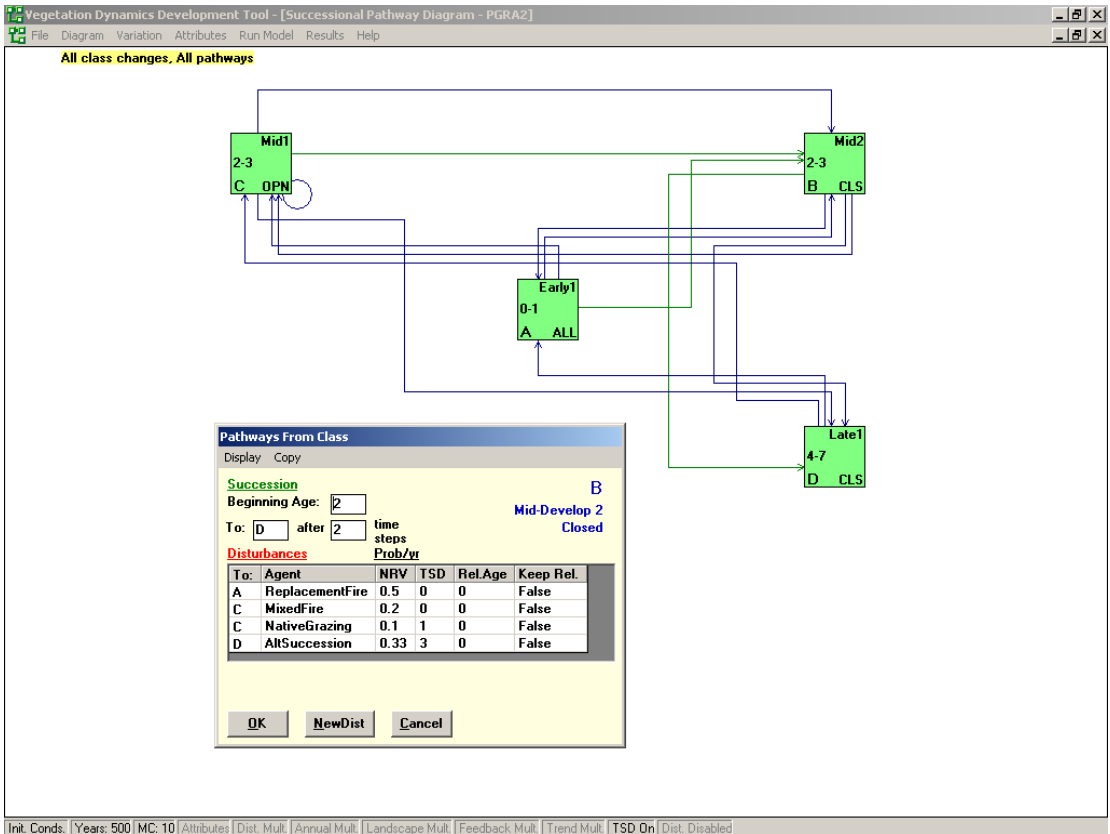
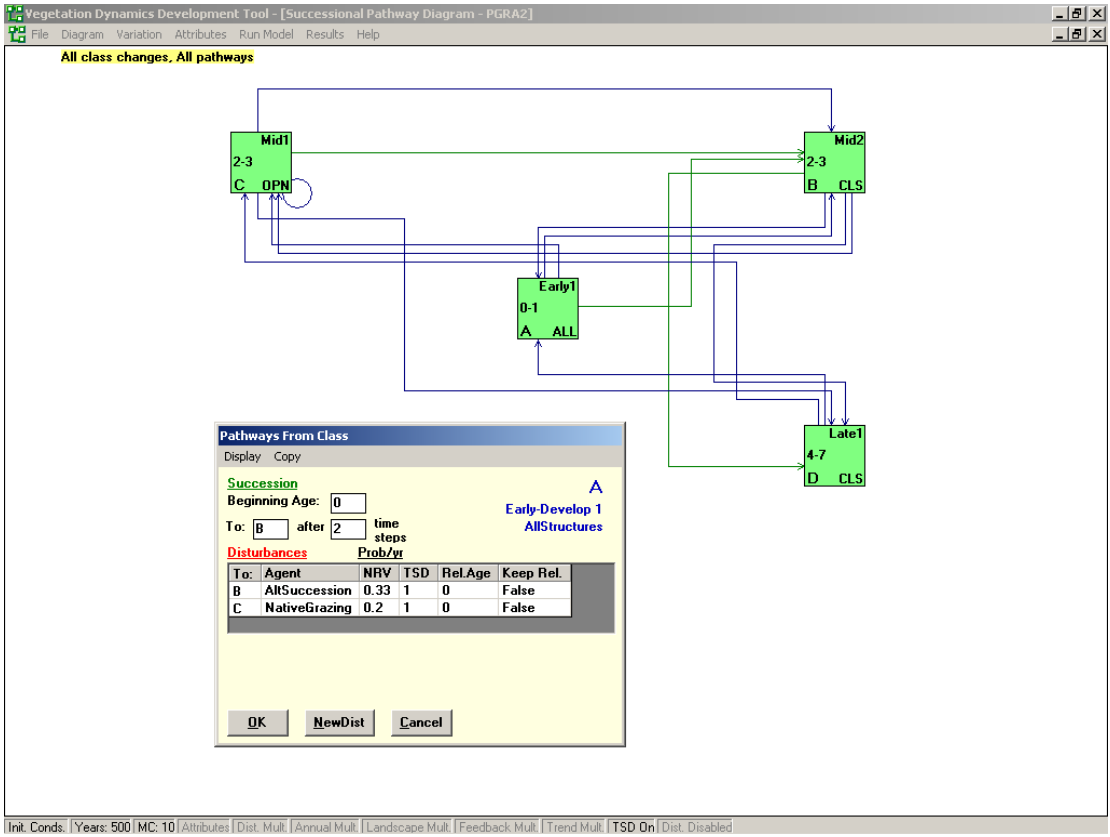




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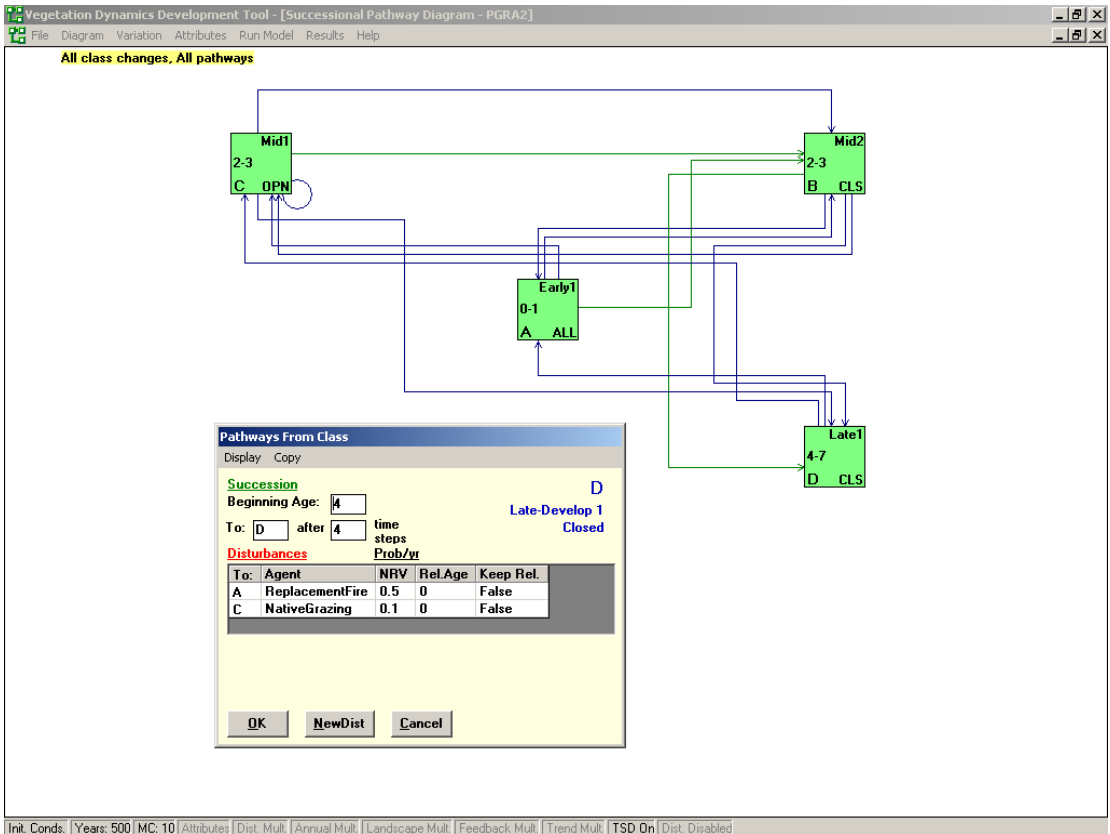
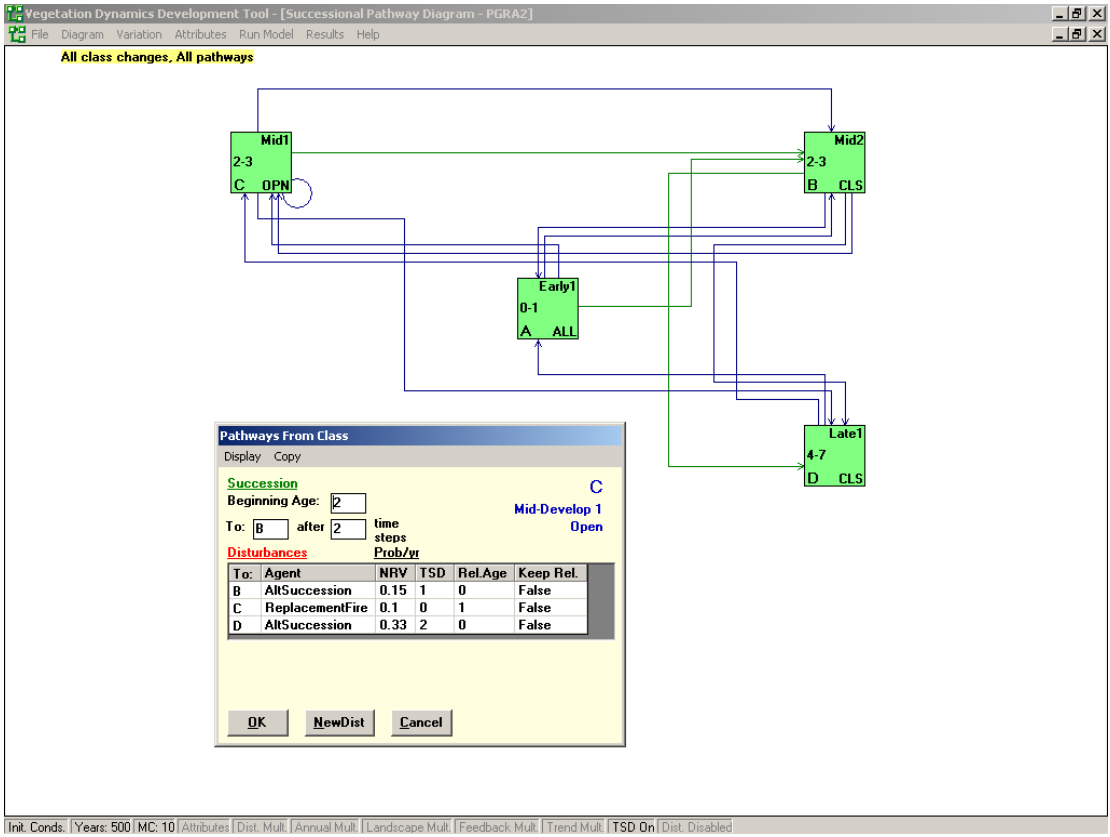




Figure 1. Bluestem-sacahuista prairie adapted from Kuchler (1964). Also known as the Coastal Prairie.