

LANDFIRE Biophysical Setting Model

Biophysical Setting 3714290

**West Gulf Coastal Plain Southern
Calcareous Prairie**

- ☐ This BPS is lumped with:
☐ This BPS is split into multiple models:

General Information

Contributors (also see the Comments field) **Date** 1/29/2007

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<u>Vegetation Type</u>	<u>Dominant Species</u>	<u>Map Zone</u>	<u>Model Zone</u>	
Upland	SCSC	37	☐ Alaska	☐ Northern Plains
Grassland/Herbaceous	SONU2		California	N-Cent. Rockies
<u>General Model Sources</u>	JUVI		☐	☐
☐ Literature			☐ Great Basin	☐ Pacific Northwest
☐ Local Data			☐ Great Lakes	☒ South Central
☒ Expert Estimate			☐ Hawaii	☐ Southeast
			☐ Northeast	☐ S. Appalachians
				☐ Southwest

Geographic Range

LA: central LA such as Fleming Glade southeast of Alexandria and the Keiffer and Tancock Prairie areas near Winnfield. TX: small prairie areas scattered in MZ37.

Biophysical Site Description

This prairie system occurs as small polygons within pine-dominated portions of the West Gulf Coastal Plain. The presence of fairly unique soils conditions exist with calcareous clays. This soil prevents the establishment of forested conditions by a combination of low available water during drought and wildfire under pre-European settlement conditions. Typically this occurs in uplands, but occasionally the soils driving the system cross small stream bottoms or riparian areas bisecting the prairies. Historically the system is found within the range of Longleaf Pine. However examples occur in Texas west to the eastern edge of the Post Oak Savannah region of east TX. Plant communities occur over relatively deep soils with circumneutral surface soil pH. These conditions form an unusual local landscape embedded in a forest system with acidic soils. Most prairie openings form distinct polygons of less than a acre to 50-100 acres or rarely more. A review of survey records from the early 1800s revealed some of these prairies in LA have been nearly or completely lost to woody invasion (Dave Moore, USFS, pers. comm.). An example includes the Tancock Prairie system which was mapped as over 1000 acres in early survey records. The Tancock Prairie remnants now form only 5-10ac polygons and roadside remnants. A similar prairie to the east of Tancock cannot be relocated as prairie, but covered about 1400ac in the early 1800s.

Vegetation Description

Blackland prairie flora typically consists of 3-6ft tall grasses and a diverse mix of forbs which flower at various times throughout the growing season. The flora is dominated by little bluestem (*Schizachyrium*

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scoparium) and Indian grass (*Sorghastum nutans*). Important associate grasses include dropseed (*Sporobolus clandestinus*), eastern gamma grass (*Tripsacum dactyloides*), bushy bluestem (*Andropogon glomeratus*), and three-awn grasses (*Aristida* spp). Common forbs present are goldenrods (*Solidago* spp), asters (*Aster* spp), sunflowers (*Helianthus* spp), evening primrose (*Oenothera biennis*), coneflowers (*Echinacea* spp), prairie clovers (*Dalea* spp), milkweeds (*Asclepias* spp), compass plant (*Silphium laciniatum*), blazing stars (*Liatris* spp) and many others (MacRoberts 1997, Foti 1989, Zollner and Simon 1998).

Post oak (*Quercus stellata*) and chinquapin oaks (*Q. muehlenbergii*) grew on ridges with thin soil over marl and chalk. Post oaks were also found either dense or in savanna-like stands over fragipans where the soil was poorly drained. Bois-d'arc (*Maclura pomifera*) was found on dry calcareous ridges with dense thickets of sumac, persimmon (*Diospyros virginiana*) and greenbriar (*Smilax* spp) (Hutchinson 1985).

Degraded blackland prairies show increased abundance of eastern red cedar (*Juniperus virginiana*) and other woody species such as persimmon, white ash (*Fraxinus americana*), winged elm (*Ulmus alata*), Carolina buckthorn (*Rhamnus caroliniana*), deciduous holly (*Ilex decidua*), flowering dogwood (*Cornus florida*) and rusty blackhaw (*Viburnum rufidulum*) due to intensive grazing and long-term fire suppression (Roberts 1979, Foti 1989, Zollner and Simon 1997).

Disturbance Description

Disturbance by both natural and native American generated fire and perhaps native grazers (bison) likely helped maintain these areas prior to European settlement.

Adjacency or Identification Concerns

The West Gulf Coastal Plain Southern Calcareous Prairies form a very distinctive habitat within the surrounding uplands. The edges where eastern red cedar (*Juniperus virginianus*) or hardwoods have invaded are less well defined; but the presence of eastern red cedar often very accurately defines the historic range of these prairies.

Native Uncharacteristic Conditions

Scale Description

This BpS appears in three forms on the landscape. Early surveyors mapped some sites as large polygons up to a couple thousand acres in size. Fire suppression in recent years caused significant decreases in size by more than 50% from 1935 to 1995 in central Louisiana's Keiffer Prairies (based on aerial photography). As a result, today we see 1-5ac (to 50-100ac+) polygons of prairies in this BpS either scattered within the historic ovals on the landscape or as similar size polygons scattered along 1-2 mile wide archs but to 5-10 miles long. The latter describes the occurrence of the Keiffer Prairies in Winn Parish, Louisiana where about 55 prairies remain scattered in such a 10 mile +/- arch of landscape.

Issues/Problems

In the last 200yrs, impacts have changed. Especially in the last 50yrs or so, fire suppression has allowed hardwoods to invade these prairies. In addition, attempts to plow and cultivate these areas or to plant them to pine trees have been attempted, usually with miserable results from the perspective of the humans attempting to change the system to farm or forest. In the past 10yrs the reintroduction of fire by prescription and the mechanical control of woody vegetation encroachment have begun to counterbalance the effects of fire suppression and other attempts to "tame" the prairies. As for the reference condition, fire occurred more frequently than under current conditions.

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Comments

Vegetation Classes

Class A 25 %

Early Development 1 Open

Upper Layer Lifeform

- ☒ Herbaceous
☐ Shrub
☐ Tree

Fuel Model

Indicator Species and Canopy Position

SCSC
 Upper
 SONU2
 Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	60 %
Height	Herb 0m	Herb 1.0m
Tree Size Class	Seedling <4.5ft	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Short grass and bare ground within 12 months of recent stand replacement (grass) fire. Blackland prairie flora will begin to return within one year. Grasses will be dominated by little bluestem (*Schizachyrium scoparium*) and Indian grass (*Sorghastrum nutans*). Frequent replacement fire occurs in this class (MFRI = four years). Native grazing also replaces this class (probability = 0.1).

Class B 60 %

Mid Development 1 Open

Upper Layer Lifeform

- ☒ Herbaceous
☐ Shrub
☐ Tree

Fuel Model

Indicator Species and Canopy Position

SCSC
 Upper
 SONU2
 Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	61 %	100 %
Height	Herb 0.6m	Herb >1.1m
Tree Size Class	Sapling >4.5ft; <5"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

A diverse plant community will return including little blue and indian grass. Important associate grasses include dropseed (*Sporobolus clandestinus*), eastern gamma grass (*Tripsacum dactyloides*), bushy bluestem (*Andropogon glomeratus*), and three-awn grasses (*Aristida* spp). Common forbs present are coneflowers (*Echinacea* spp), prairie clovers (*Dalea* spp), milkweeds (*Asclepias* spp), compass plant (*Silphium laciniatum*), blazing stars (*Liatris* spp) and many others. Frequent replacement fire occurs in this class (MFRI = four years). Without disturbance this class will succeed to C (probability = 0.01). Native grazing maintains this class (probability = 0.1).

Class C 15 %

Late Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
☐ Shrub
☒ Tree

Fuel Model

Indicator Species and Canopy Position

JUVI
 Upper
 LIST2
 Upper
 Middle

Structure Data (for upper layer lifeform)

	Min	Max
Cover	31 %	100 %
Height	Tree 0m	Tree 10m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

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Description

Includes two types of woody habitat within the prairie system. In prairie edges, eastern redcedar (*Juniperus virginiana*) often invades the prairie edge in the absence of fire. Random lack of fire allows cedar to increase in size to the point that it begins to reduce the probability of ground fires by reducing ground fuels through competition for resources. Alternatively, in areas with topographic position where fire is less likely to enter, hardwood shrubs may invade the prairie edges creating an area of dense shrub inclusions in some areas of the prairie. Frequent low intensity fire will maintain this class (MFRI = five years). Replacement fire occurs every 30yrs. Rare ice storms and wind events will transition this class back to B (probability = 0.0025).

Class D **0 %**

[Not Used] [Not Used]

Indicator Species and Canopy Position

Structure Data (for upper layer lifeform)

	<i>Min</i>	<i>Max</i>
<i>Cover</i>	%	%
<i>Height</i>		
<i>Tree Size Class</i>		

Upper Layer Lifeform

- ☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model

☐ Upper layer lifeform differs from dominant lifeform.

Description

Class E **0 %**

[Not Used] [Not Used]

Indicator Species and Canopy Position

Structure Data (for upper layer lifeform)

	<i>Min</i>	<i>Max</i>
<i>Cover</i>	%	%
<i>Height</i>		
<i>Tree Size Class</i>		

Upper Layer Lifeform

- ☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model

☐ Upper layer lifeform differs from dominant lifeform.

Description

Disturbances

Fire Regime Group:** II

Historical Fire Size (acres)

Avg 0

Min 0

Max 0

Sources of Fire Regime Data

- ☐ Literature
☐ Local Data
☐ Expert Estimate

Additional Disturbances Modeled

Fire Intervals

	<i>Avg FI</i>	<i>Min FI</i>	<i>Max FI</i>	<i>Probability</i>	<i>Percent of All Fires</i>
<i>Replacement</i>	5			0.2	85
<i>Mixed</i>					
<i>Surface</i>	28			0.03571	15
<i>All Fires</i>	4			0.23572	

Fire Intervals (FI):

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inverse of fire interval in years and is used in reference condition modeling. Percent of all fires is the percent of all fires in that severity class.

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☐ Insects/Disease ☒ Native Grazing ☐ Other (optional 1)
☒ Wind/Weather/Stress ☐ Competition ☐ Other (optional 2)

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Personal Communication

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