LANDFIRE Biophysical Setting Model

Biophysical Setting 9813230 West Gulf Coastal Plain Mesic Hardwood Forest

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

General Information

Contributors (also see the Comments field **Date** 1/24/2007

Modeler 1 Mark Clark mclark@tnc.org **Reviewer** Douglas Zollner dzollner@tnc.org
Modeler 2 **Reviewer**
Modeler 3 **Reviewer**

Vegetation Type
Forest and Woodland

Map Zone
98

Model Zone
☐ Alaska ☐ N-Cent.Rockies
☐ California ☐ Pacific Northwest
☐ Great Basin ☑ South Central
☐ Great Lakes ☐ Southeast
☐ Northeast ☐ S. Appalachians
☐ Northern Plains ☐ Southwest

Dominant Species*
QUAL
QURU
FAGR
QUPA5

General Model Sources
☑ Literature
☑ Local Data
☑ Expert Estimate

Geographic Range

This ecological system is found in limited upland areas (especially side slopes and narrow ridgetops) of the Gulf Coastal Plain west of the Mississippi River. These areas were topographically isolated from historically fire-prone, pine-dominated uplands in eastern TX, western LA and southern AR.

In LF MZ37 in ECOMAP section 231.

Biophysical Site Description

Soils can be quite variable ranging from coarse to loamy in surface texture. Most are acidic in surface reactions and less commonly circumneutral. These sites have moderate to high fertility and moisture retention. Sites are often found along slopes above perennial streams in the region.

Vegetation Description

Vegetation indicators are mesic hardwoods such as American beech (Fagus grandifolia), white oak (Quercus alba) and American holly (Ilex opaca), although scattered, large-diameter pines (most often loblolly [Pinus taeda]) are also often present. Spring-blooming herbaceous species are typical in the understory of most examples. This system is not known to support any localized endemic or globally rare plant species.

At Nacatoch Ravines Natural Area in Arkansas, the mesic slope and ravine forests are very diverse with large trees and a well-formed subcanopy and herbaceous layer. The canopy is a mix of more mesic trees including northern red oak (Q. rubra), Shumard oak (Q. shumardii), chinkapin oak (Q. muehlenbergii), white oak, sweetgum (Liquidambar styraciflua), white ash (Fraxinus americana), sycamore (Platanus occidentalis), basswood (Tilia americana), mockernut hickory (Carya tomentosa), blackgum (Nyssa

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**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

sylvatica) and maple (Acer spp). There are multiple shrub layers with redbud (Cercis canadensis), buckeye (Aesculus pavia), hophornbeam (Ostrya virginiana), deciduous holly (I. decidua), witch hazel (Hamamelis virginiana) , Hercules club (Aralia spinosa), American hornbeam (Carpinus caroliniana), paw paw (Asimina triloba) and cane (Arundinaria gigantea). The herbaceous layer is rich in recently burned areas (sparse in unburned) including the uncommon eared goldenrod (Solidago auriculata) and puccoon (Lithospermum caroliniense). Seeps are dense with ferns, vines and forbs. Many of the AR plant species of concern occur in the mesic ravines.

Thin-barked trees like American beech are more fire sensitive so are limited to areas subject to low-intensity fire.

Disturbance Description

Growing season (April-September) and pre/post drought year burns may have a greater effect on maintaining an open understory than other burns. An examination of Arkansas Forestry Commission records indicate a prevalence of lightning ignited fires occurring from mid-July through October (Foti and Glenn 1990). Anthropogenic fires could have occurred in any season but early records of aboriginal burning reference September through December (Young and Hoffman 1995, Lottinville 1980).

Normally, fire would enter this system from up slope pine-oak systems. Severity/intensity is typically lower than in the drier up-slope pine-oak systems.

Other disturbance include tree fall resulting in small gaps.

Adjacency or Identification Concerns

This system is always up slope from West Gulf Coastal Plain Large River Floodplain Forests and/or Small Stream Riparian Forest. It is down slope from West Gulf Coastal Plain Pine-Hardwood Forest.

Native Uncharacteristic Conditions

Scale Description

This system occurs at Large Patch scale (100-1000ac).

Issues/Problems

Conversion to pine plantation and pasture.
Imported from MZ37 by Brendan Ward on 8/23/07.

Comments

Vegetation Classes

Class A **5 %**

Early Development 1 All Structure

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 9

Description

Indicator Species* and Canopy Position

QUERC	Low-Mid
CHSE2	Lower

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	0 %	80 %
Height	Tree 0m	Tree 5m
Tree Size Class	Seedling <4.5ft	

☐ Upper layer lifeform differs from dominant lifeform.

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0-9yrs. Oak regeneration with grass/forb regrowth. Quercus spp, mixed hardwood shrubs, Chasmanthium sessiliflorum, sedges (Carex spp) and forbs with weedy component. Succeeds to C with mixed and replacement fire occurring. C as alternate succession pathway, though is the most likely path. Replacement fire and mixed fire both occur in this class (Replacement MFRI = 83yrs; mixed MFRI = 20yrs).

Class B 25 %

Mid Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 8

Indicator Species* and Canopy Position

QUAL	Mid-Upper
QURU	Mid-Upper
CACA18	Middle
ILOP	Middle

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	71 %	100 %
Height	Tree 5.1m	Tree 25m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

10-54yrs. Mid-development class dominated by mixed hardwood trees and shrubs. Dense overstory of Quercus alba, Q. rubra, Q. sinuata, Q. velutina, Tilia caroliniana, Carya tomentosa, Liquidambar styraciflua, Fraxinus americana and Nyssa sylvatica. Mid-story species include Q. alba, Q. rubra, T. caroliniana, C. tomentosa, Cornus florida, Ostrya virginiana, Acer rubrum and Carpinus caroliniana. Shrubs are sparse. Callicarpa americana is a dominant shrub species.

Succeeds to class E (late-closed). 22yr MFRI divided between mixed, surface, and replacement (mixed MFRI = 60yrs; surface MFRI = 30yrs; replacement MFRI = 200yrs).

Class C 10 %

Mid Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 9

Indicator Species* and Canopy Position

QUAL	Upper
QURU	Upper
CAAL27	Middle
CHSE2	Lower

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	11 %	70 %
Height	Tree 5.1m	Tree 25m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

10-54yrs. Open mid-development class. Open canopy dominated by fire-tolerant oak species. Open overstory and limited midstory. Discontinuous herbaceous component. 18yr MFRI divided between replacement (rare) and surface fire (replacement MFRI = 300yrs; surface MFRI = 13yrs). Without fire for 15yrs this class will succeed back to B.

Class D 20 %

Late Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 9

Indicator Species* and Canopy Position

QUAL	Upper
QURU	Upper
CAAL27	Middle
CHSE2	Lower

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	11 %	70 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

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55yrs+. Mature open canopy mixed hardwood woodland to savanna. Very limited midstory. Well developed herbaceous understory governed by percent canopy closure. Made up of diverse grass and forb species.

Tree heights not necessarily different from classes B and C. More difference in crown size and stem diameter (both large in class D).

Ground fires maintaining herbaceous understory and fire intolerant mid-story species. Gaps in canopy mainly from windfall. Replacement wind events (tornados) would rarely occur, each every 300yrs. MFRI is 15yrs with most of the fire being surface fire (surface MFRI = 13yr). Without fire for 20yrs, this class will succeed to E.

Class E **40 %**

Late Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 8

Indicator Species* and Canopy Position

QUAL	Upper
QURU	Upper
FAGR	Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	71 %	100 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

55yrs+. Mature closed canopy mixed hardwood forest. Dense midstory. Sparse shade-tolerant herbaceous understory. Rare replacement events like fire combined with drought and tornados rarely occur (every 300yrs each). All fire return interval is 22yrs, with the majority being low intensity (surface MFRI = 40yrs). Mixed fire will open the canopy to D every 67yrs.

Disturbances

Fire Regime Group:** I

Historical Fire Size (acres)

Avg 100
Min 0
Max 0

Sources of Fire Regime Data

- ☑ Literature
- ☐ Local Data
- ☐ Expert Estimate

Fire Intervals

	Avg FI	*Min FI*	*Max FI*	*Probability*	*Percent of All Fires*
Replacement	300			0.00333	6
Mixed	100			0.01	18
Surface	23			0.04348	77
All Fires	18			0.05681	

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 inver 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.

Additional Disturbances Modeled

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

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LANDFIRE Biophysical Setting Model

***Biophysical Setting* 9813390** **West Gulf Coastal Plain Chenier and Upper Texas Coastal Fringe Forest and Woodland**

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

General Information

Contributors (also see the Comments field **Date**

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Modeler 2			**Reviewer**
Modeler 3			**Reviewer**

Vegetation Type
Forest and Woodland

Map Zone
98

Model Zone
☐ Alaska ☐ N-Cent.Rockies
☐ California ☐ Pacific Northwest
☐ Great Basin ☑ South Central
☐ Great Lakes ☐ Southeast
☐ Northeast ☐ S. Appalachians
☐ Northern Plains ☐ Southwest

Dominant Species*
QUVI ACFA
CELA MOCE2
ZACL
CRVI2

General Model Sources
☐ Literature
☑ Local Data
☑ Expert Estimate

Geographic Range

This system includes a range of woody vegetation present along the northern Gulf of Mexico, from LA to the upper TX coast, including shell ridges along the coast and bay margins, coastal salt domes, stranded ancient barrier ridges (Ingleside barrier strandplain) and chenier ridges of the chenier plain. It is heterogeneous in physiognomy, including forests, woodlands and shrublands. The chenier plain is characterized by a prograding coastline replenished by sediments carried to the Gulf initially by the Mississippi and subsequently the Atchafalaya and other rivers. It is void of barrier islands and shoreline, sediments are reworked by waves into beach ridges, sometimes with a substantial shell component. This process has been continuing since the last glacial retreat, and as the coast line progrades, older beach ridges are left as interior ridges surrounded by marsh. These interior beach ridges are referred to as cheniers (French for oak) because they were historically dominated by live oak (Quercus virginiana). Ridges parallel the coast and are usually three meters above mean sea level. Today, very few remain vegetated by a live oak-dominated forest because many have been cleared for agriculture. Though not confined to coastal areas, salt domes are a distinctive feature along the Gulf Coast of upper TX and LA where they often form a drastic contrast to the low-lying Coastal Plain sediments surrounding them. Formed by the rise of salt masses which push up overlying strata, salt domes may rise 30m above the surrounding landscape. The natural vegetation of cheniers and salt domes are oak-dominated woodlands and forests. The Ingleside barrier strandplain is a Pleistocene barrier ridge that outcrops discontinuously along the TX coast. A note on terminology from Barrow et al. (2006). "The word derives from the French 'chene', meaning oak and in that language 'cheniere' is literally an oak grove. It is applied loosely to any grove of trees, predominantly oak in character. Scientifically, the term "chenier" is applied to certain land formations, whose origin and character are quite distinctive, and unlike most land formations in general." The description and model presented here are derived entirely from the cheniers of LA and desperately

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need to be reviewed by those familiar with the TX flora and coastal plant communities.

Biophysical Site Description

The vegetation is dependent on fresh water from rain, since the surrounding marsh varies from fresh to oligohaline to brackish and even the open Gulf waters. The slight to modest elevation of the cheniers (from a few centimeters to three meters in height) and soil porosity (mostly coarse sand and shell) facilitates absorption of rainwater into the cheniers. There are no natural ponds on the cheniers though recent surface mining has resulted in numerous deep ponds that maybe somewhat freshwater to quite brackish. The cheniers are critically important stopover sites for neotropical trans-Gulf migratory birds, mostly federally protected songbirds. The cheniers present vegetation and arthropod food sources for the birds on both legs of the trans-Gulf migration.

Vegetation Description

Pre-Columbian vegetation was usually a closed canopy dominated by live oak (Q. virginiana) and sugarberry (Celtis laevigata) with a general dominance of Celtis on the cheniers nearest the coast and Q. virginiana on the inland cheniers. Subcanopy species include Hercules' club (Zanthoxylum clava-herculis), green hawthorn (Crataegus viridis) and sweet acacia (Acacia farnesiana).

Disturbance Description

Fires in the adjacent marsh, whether of anthropogenic or lightning origin, probably swept into the cheniers and were carried by the coarse groundcover and leaf litter. It is unlikely that flame heights reached into the canopy. This fuel was probably insufficient to kill the thick-barked, mature Q. virginiana found in the canopy but probably damaged or killed C. laevagata and other thin-barked dominant or codominant species. Subcanopy, shrub and herbaceous species as well as seedlings of the canopy species were probably severely impacted by fire if sufficient fuel was present to sustain a ground fire. The rhizomotous C. viridis and lignotuberous greenbriar (Smilax spp), yaupon (Ilex vomitoria), and wax myrtle (Morella cerifera) probably survived the surface fires, though the aerial portions may have been killed. Severe hurricanes have a tremendous impact on the cheniers. The winds defoliate the vegetation, snap limbs and may uproot trees. The storm surges carry debris into the cheniers which may mechanically impact the vegetation as well as depositing salt on the vegetation surfaces and into the soil, essentially poisoning the species at are not resistant to salinity. Loss of vegetation due to fire or tropical weather systems may directly impact the food resources required by trans-Gulf migratory birds.

Adjacency or Identification Concerns

Remote sensing identification of the forested cheniers is usually unambiguous since the forested community stands in contrast to the surrounding marsh vegetation. However, natural cheniers share vegetation characteristics with dredge spoil, though spoil is usually deposited in very straight, very uniform lines immediately adjacent to a channel or road.

Native Uncharacteristic Conditions

Loblolly pine (Pinus taeda), slash pine (P. elliottii) and sycamore (Platanus occidentalis) introduced around homesites, can be found apparently naturally reseeding.

Scale Description

Cheniers vary in areal extent from less than a hectare for midden forests to over 100km in length and nearly a kilometer in width for the largest cheniers.

Issues/Problems

The aforementioned recent quarrying and resultant loss of land and introduction of brackish pools has resulted in permanent loss of chenier habitat. In addition, cattle grazing and human habitation have

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resulted in introduction of numerous exotic species, bahiagrass (Paspalum notatum), is a common species where cattle graze. Transportation and utilities infrastructure on the cheniers have severely degraded the natural forest. Exotic forest species, especially the Chinese tallow tree (Triadeca sebiferum) and cherry laurel (Prunus laurocerasus) have become important canopy and subcanopy constituents. These species provide relatively poor sources of food for trans-Gulf migrants. Other ornamental vegetation has been introduced around homesites and may become naturalized on the cheniers.

Comments

This model was created for MZ37 and adopted for MZ98 without changes so no change in model author was made.

Vegetation Classes

Class A 14 %

Early Development 1 All Structure

Upper Layer Lifeform

- [x] Herbaceous
- [ ] Shrub
- [ ] Tree

Fuel Model 1

Indicator Species* and Canopy Position

SCHIZ4	Middle
CYDA	Lower
LYBE	Upper
PANO2	

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	100 %
Height	Herb 0m	Herb 0.5m
Tree Size Class	None	

- [ ] Upper layer lifeform differs from dominant lifeform.

Description

This class consists of the chenier devoid of forest vegetation. This may occur due to extreme fire conditions or extreme hurricane conditions. In either case, all canopy, subcanopy and shrubs species maybe killed. Regeneration may depend entirely on the seedbank or transport from off-site if a storm surge of sufficient magnitude, duration, and salinity impacts the chenier. Lesser impacts from lower intensity storms or from fires may allow regeneration from subsurface germinative sources (seeds, tubers, rhizomes, etc).The grasses will dominate the early successional/regenerative chenier. Little bluestem grass (Schizachyrium scoparium), bermuda grass (Cynodon dactylon) and wolfberry (Lycium berlandieri) are common pioneer species.

Replacement fires would occur and would likely be followed by grazing (20yr cycle). Low intensity fire may also occur when fuel loads were sparse (MFRI=100yrs). Without fire for 15yrs, this class will succeed to B.

Class B 2 %

Mid Development 1 Closed

Upper Layer Lifeform

- [ ] Herbaceous
- [x] Shrub
- [ ] Tree

Fuel Model 3

Indicator Species* and Canopy Position

QUVI	Upper
CELA	Upper
CRVI2	Mid-Upper
MOCE2	Middle

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	30 %
Height	Shrub 0m	Shrub >3.1m
Tree Size Class	None	

- [ ] Upper layer lifeform differs from dominant lifeform.

Description

This class consists of regenerating forest and also low-lying areas immediately adjacent to the marsh where frequent flooding or saline conditions limit woody growth. Grazing may retard tree growth and canopy development.

Replacement fires would occur (MFRI = 50yrs). Low intensity fire may also occur when fuel loads were sparse (MFRI=33yrs). Without fire for 15yrs, this class will succeed to C. Hurricanes and tropical storms

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could be replacement events every 150yrs.

Class C 84 %

Mid Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 8

Indicator Species* and Canopy Position

QUVI	Upper
CELA	Upper
ZACL	Mid-Upper
ACFA	Low-Mid

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	51 %	90 %
Height	Tree 5.1m	Tree 25m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

This class consists of mature forest with a closed canopy and a low-density subcanopy and shrub layer. Herbaceous layer varies from sparse to luxurient. Grazing may inhibit shrub and herbaceous layers.

Replacement fires would rarely occur (MFRI = 200yrs). Low intensity fire may also occur when fuel loads were sparse (MFRI = 20yrs). Without fire for 15yrs, this class will succeed to C. Hurricanes and tropical storms could be replacement events every 150yrs.

Class D 0 %

[Not Used] [Not Used]

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☐ Tree

Fuel Model

Indicator Species* and Canopy Position

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	%	%
Height		
Tree Size Class		

☐ Upper layer lifeform differs from dominant lifeform.

Description

Class E 0 %

[Not Used] [Not Used]

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☐ Tree

Fuel Model

Indicator Species* and Canopy Position

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	%	%
Height		
Tree Size Class		

☐ Upper layer lifeform differs from dominant lifeform.

Description

Disturbances

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Fire Regime Group:** I

Historical Fire Size (acres)

Avg 0
Min 0
Max 0

Sources of Fire Regime Data

- ☐ Literature
- ☐ Local Data
- ☐ Expert Estimate

Fire Intervals	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
Replacement	90			0.01111	20
Mixed					
Surface	23			0.04348	80
All Fires	18			0.0546	

Fire Intervals (FI):

Fire interval is expressed in years for each fire severity class and for all types of fir combined (All Fires). Average FI is central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inver 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.

Additional Disturbances Modeled

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

References

NatureServe. 2007. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA. Data current as of 10 February 2007.

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LANDFIRE Biophysical Setting Model

Biophysical Setting 9813480 West Gulf Coastal Plain Upland Longleaf Pine Forest and Woodland

☑ *This BPS is lumped with: 1403 and 1404*

☐ *This BPS is split into multiple models: BpS 1348 is systematically lumped with 1403 and 1404. BpS 1403 and 1404 are too fine for mapping and modeling, both may occur with other BpS.*

The description of BpS 1462 (West Gulf Coastal Plain Seepage Swamp and Baygall) is very broad and includes inclusional communities more associated with the outer coastal plain. For the inner coastal plain (hilly uplands) the most important wetland types are hillside seepage bogs and small baygall communities associated with small streams. Bayheads and hillside seeps included as small patches in this BpS.

General Information

Contributors (also see the Comments field **Date** 1/24/2007

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Modeler 3			**Reviewer**

Vegetation Type

Forest and Woodland

Map Zone

98

Model Zone

☐ Alaska ☐ N-Cent.Rockies
☐ California ☐ Pacific Northwest
☐ Great Basin ☑ South Central
☐ Great Lakes ☐ Southeast
☐ Northeast ☐ S. Appalachians
☐ Northern Plains ☐ Southwest

Dominant Species*

PIPA2	ANVI2
SCSC	QUST
ANGE	QUMA
ANTE2	QUIN

General Model Sources

☑ Literature
☐ Local Data
☑ Expert Estimate

Geographic Range

This BpS occurs in the hilly uplands of western and central LA. This BpS also extends into eastern TX. In MZ37 this BpS is found in ECOMAP subsections 231Ef, 231Eg, 232Fa, 232Fb, 232Fe and 232Ff.

Biophysical Site Description

This BpS occurs on acidic loamy sands to acid clays associated with Pleistocene or Tertiary formations. The community is characteristically dissected by small to large branch or creek bottoms.

Vegetation Description

Pinus palustris (longleaf pine) is the dominant overstory species, and in locations where fire has frequently occurred, it is often the only canopy species. It is reported in the literature that Q. marilandica (blackjack oak) and Q.stellata (post oak) were common associates of longleaf pine in the northern part of its range. Where fire is less frequent or suppressed, a number of overstory associates may occur, including Pinus echinata (shortleaf pine), P. taeda (loblolly pine), Nyssa sylvatica (black gum), Liquidambar styraciflua (sweetgum), Q. falcata (southern red oak) , Q. stellata, Q. marilandica, Q. shumardii (shumard oak), Q. alba (white oak), Q. nigra (water oak), Prunus serotina (black cherry), Carya tomentosa (mockernut hickory), C. texana (black hickory, central LA), Acer rubrum (red maple), Diospyros

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virginiana (persimmon) and Sassafras albidum (sassafras). In sandy soils, Q. incana (bluejack oak) and Q. hemisperica (upland laurel oak) are frequent associates. Significant shrub species include Cornus florida (flowering dogwood), Vaccinium arboreum (farkleberry), V. elliottii (elliott's blueberry), V. stamineum (deer berry), V. darrowii (dwarf blueberry, southeast Louisiana), Gaylussacia dumosa (dwarf huckleberry, southeast Louisiana), Callicarpa americana (French mulberry), Myrica cerifera (wax myrtle), Bumelia lanuginosa (chittum-wood), Ilex vomitoria (yaupon), I. opaca (American holly), Rubus spp (blackberries) and Rhus copallina (winged sumac). Common vines include Vitis spp (grapes), Smilax spp (greenbriers), Parthenocissus quinquefolia (Virginia creeper) and Gelsemium sempervirens (yellow jessamine). The herbaceous flora may be exceedingly diverse if fire has frequently occurred. Grasses, composites and legumes are predominant in the gound layer. Andropogon spp (broomsedges) and Schizachyrium spp (bluestems) are usually the dominant grasses, but several other genera are usually present, including Aristida spp (three-awn grasses), Sporobolus (dropseeds), Panicum spp (panic grasses), Anthaenantia spp (silky scales), Ctenium aromaticum (toothache grass), Digitaria spp (crab grasses), Eragrostis spp (love grasses), Erianthus spp (plume grasses), Gymnopogon spp (skeleton grasses), Muhlenbergia spp (muhly grasses), Paspalum spp (paspy grasses) and Setaria spp (bristle grasses). Composites include Aster spp (asters), Carphephorus odoratissimus (vanilla plant), Chrysopsis spp (golden asters), Heterotheca spp (golden asters), Elaphantopus spp (elephant-foot), Eupatorium spp (thoroughworts), Euthamia spp (flat-topped goldenrods), Gnaphalium spp (rabbit tobaccos), Helenium spp (sneeze-weeds), Helianthus spp (sunflowers), Liatris spp (blazing-stars), Rudbeckia spp (brown-eyed susans), Solidago spp (goldenrods) and Vernonia spp (ironweeds). Prominent legumes are Baptisia spp (indigos), Cassia spp (partridge-peas), Centrosema virginianum (butterfly pea), Clitoria mariana (pigeon wings), Crotolaria spp (rattle pods), Desmodium spp (beggar's ticks), Lespedeza spp (bush clovers), Stylsanthes biflora (pencil-flower), Rhynchosia spp (snout beans) and Tephrosia spp (hoary peas). Additional frequent forbs include Oenothera spp. (evening primroses), Polygala spp (milkworts), Lobelia spp (lobelias), Callirhoe papaver (poppy-mallow), Ruellia spp (wild petunias), Hypoxis spp (yellow-eyed grasses), Asclepias spp (mildweeds), Lechea spp (pinweeds), Euphorbia spp (spurges), Sabatia spp (rose-gentians), Agalinis spp (false foxgloves) and Rhexia spp (meadow beauties). The fern Pteridium aquilinum (bracken fern) is often conspicuous in large colonies.

The Catahoula Barrens is an inclusional community that occurs within this BpS. It occurs on sandstone outcrops with shallow acidic soils which are highly erodable. The community is characterized by widely scattered, stunted trees and shrubs and a sparse ground cover of grasses and forbs with some areas consisting of exposed rock with little or no vegetation. Tree species include P. palustris, P. echinata, P. taeda, Q. stellata, Q. incana, Q. marilandica and Liquidamber styraciflua. Shrubs may include Ilex vomitoria, Vaccinium arboreum, V. elliottii and Bumelia lanuginosa. Common herbaceous species include Bigelowia virgata (rayless goldenrod), Andropogon spp, Eragrostis spp, Liatris spp (blazing stars) and Aster spp. A rare occurrence in TX is the Navasota ladies tresses (Spiranthes parksii), a threatened and endangered species.

Disturbance Description

This BpS experiences frequent surface fires, every 1-5yrs, and is classified in Fire Regime Group I. Fires are usually low in intensity overall, consuming only shrubs and herbs, but it will occasionally kill patches of young pine regeneration and rarely kill individual older trees. Individual fires cover extensive areas. Replacement and mixed 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. Effects of single fires are minimal, but are cumulative over time.

Open structural stages are characterized by surface fire disturbances of three years while closed structural

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stages are characterized by mixed fire regimes occurring every 100yrs. Structural stage B also contains surface fire frequencies of once every 15yrs which would not be sufficient to change the vegetative structure from a closed to a more open mid-story layer as does a mixed fire within the same stage.

Wind/Weather/Stress disturbances are characterized by hurricane and tornado occurrences every 200yrs except for the closed-late stage where weather could influence transition every 100yrs. Ice storms are also a weather factor but to what degree is unknown.

Competition between pine and hardwood trees maintain the mid and late classes.

Adjacency or Identification Concerns

This BpS is the presumed matrix vegetation type of the inner (landward) portions of the West Gulf Coastal Plain in LA and eastern TX within the range of longleaf pine. The system is bounded on the outer (seaward) side by West Gulf Coastal Plain Wet Longleaf Pine Savanna and Flatwoods (BpS 1451) and on the inner (landward) side primarily by West Gulf Coastal Plain Pine-Hardwood Forest (BpS 1371). Uncharacteristic vegetation types include even-aged canopy stands in which age structure has been homogenized by logging or clearing. Examples are found where loblolly pine, shortleaf pine, slash pine or oaks have replaced some or all of the longleaf pine, and 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.

Native Uncharacteristic Conditions

Loblolly pine plantation.

In the absence of fire, shrub or mid-story hardwood densities increase.

Scale Description

The dominant longleaf pine canopy is patchy in distribution as represented by the open structural stages. Canopy gaps are created by fire mortality, lightning and wind throw at the scale of individual trees or several trees. These "gaps" are represented under structural stage A of the model. Palik and Pederson (1996) report patch disturbances removed 550-1300 square meters (0.14-0.32ac) of exposed crown area to form openings 1000-2000 square meters (0.25-0.5ac); but occur only once per 1000ha in five years.

Issues/Problems

Imported from MZ37 by Brendan Ward on 8/23/07

Comments

For MZ37, this model was adapted from the Rapid Assessment model R9LLBS (Longleaf Pine/Bluestem).

The Ecological Classification System developed by James Van Kley at Stephen F Austin State University for the National forests in Texas and the Kisatchie National Forests in Louisiana is a good reference document for describing this BpS (Turner et al. 1999).

Vegetation Classes

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Class A 5 %

Early Development 1 All Structure

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 2

Indicator Species* and Canopy Position

ANTE2	Upper
ANVI2	Lower
SCSCS3	Lower

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	0 %	50 %
Height	Tree 0m	Tree 5m
Tree Size Class	Sapling >4.5ft; <5"DBH	

☑ Upper layer lifeform differs from dominant lifeform.

Though trees are the upper layer lifeform, the vegetative cover is predominantly native grasses.

Description

Class A includes canopy gaps, mostly from a single tree to a quarter acre in size, with pine regeneration up to 14yrs old. The ground cover is predominantly native grasses. Tree cover ranges from 0-50%. This class transitions to class B in the absence of fire for 10yrs and to class C in the presence of fire. Surface fire is the dominant fire type with a MFRI of three years. Replacement fire is rare at 1 100yr MFRI.

Class B 5 %

Mid Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 7

Indicator Species* and Canopy Position

PIPA2	Upper
QUST	Mid-Upper
LIQUI	Low-Mid
ILVO	Low-Mid

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	71 %	90 %
Height	Tree 5.1m	Tree 25m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Class B is characterized by patches, most ¼ acre or less, of canopy pines 15-49yrs old, and a substantial component of hardwoods or other pine species encroaching in the absence of fire. Hardwood and encroaching pine cover is >50%. The pine canopy cover ranges from 71-90%. This class succeeds to class E in the absence of fire. This class can transition to class A with replacement fire (MFRI = 100yrs) or wind storm (every 200yrs). This class can transition to class C with a mixed fire (MFRI = 50yrs) or partial blowdown. Surface fire is the dominant fire type (MFR = 15yrs).

Class C 15 %

Mid Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 2

Indicator Species* and Canopy Position

PIPA2	Upper
ANVI2	Lower
SCSCS3	Lower

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	31 %	70 %
Height	Tree 5.1m	Tree 25m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Class C includes patches, most ¼ acre or less, with canopy pines 15-49yrs old, and a minimal hardwood component due to frequent fire. The ground cover is dominated by grasses. The pine canopy cover ranges from 25-75%. This class transitions to class B in the absence of fire for 15yrs. This class transitions to class A with a hurricane (every 200yrs). This class matures to class D with time. Regular surface fire maintains this open class (MFRI = three years).

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Class D 70 %

Late Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 2

Indicator Species* and Canopy Position

PIPA2	Upper
ANVI2	Lower
SCSCS3	Lower

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	31 %	70 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Class D includes patches, most ¼ acre or less, with canopy pines 50yrs+ old, and a minimal component of hardwoods. The ground cover is dominated by grasses. The pine canopy cover ranges from 25-75%. This class transitions to Class A with a hurricane (every 200yrs). This class transitions to E in the absence of fire. Canopy closure will take considerable time however midstory closure will take place within 15-20yrs in many areas. Regular surface fire maintains this open class (MFRI = three years).

Class E 5 %

Late Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 7

Indicator Species* and Canopy Position

PIPA2	Upper
QUST	Mid-Upper
LIQUI	Upper
PITA	Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	71 %	100 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Class E is characterized by patches with canopy pines 50yrs+ old, and a substantial component of hardwoods or pines other than longleaf in either the overstory or understory. The ground cover is shrubby or sparse. Hardwood and encroaching pine cover is >50%. This class transitions to class B with a hurricane (100yrs). This class transitions to class A with replacement fire (MFRI = 100yrs). This class transitions to class D with mixed fire (MFRI = 100yrs). A very dense tall shrub component of species such as Iex vomitoria, Calicarpa americana and Myrica cerifera typically develops. Height ranges from 85-100ft.

Disturbances

Fire Regime Group:** I

Historical Fire Size (acres)

Avg 10000
Min 1000
Max 100000

Sources of Fire Regime Data

- ☑ Literature
- ☐ Local Data
- ☑ Expert Estimate

Fire Intervals

	Avg FI	*Min FI*	*Max FI*	*Probability*	*Percent of All Fires*
Replacement	625			0.0016	1
Mixed	770			0.0013	1
Surface	4	1	5	0.25	99
All Fires	4			0.2529	

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 inver 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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Additional Disturbances Modeled

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

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**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

LANDFIRE Biophysical Setting Model

Biophysical Setting 9813710 West Gulf Coastal Plain Pine-Hardwood Forest

☑ *This BPS is lumped with: 1405*

☐ *This BPS is split into multiple models: BpS 1405 is systematically lumped with 1371. BpS 1405 is too fine for mapping and modeling.*

General Information

Contributors (also see the Comments field **Date** 1/23/2007

Modeler 1	Larry Threet	larry_threet@fws.gov	**Reviewer**
Modeler 2	Mike Melnechuk	mmelnechuk@tnc.org	**Reviewer**
Modeler 3			**Reviewer**

Vegetation Type

Forest and Woodland

Map Zone

98

Model Zone

☐ Alaska ☐ N-Cent.Rockies
☐ California ☐ Pacific Northwest
☐ Great Basin ☑ South Central
☐ Great Lakes ☐ Southeast
☐ Northeast ☐ S. Appalachians
☐ Northern Plains ☐ Southwest

Dominant Species*

PIEC2
PITA
QUERC
ANDRO

General Model Sources

☐ Literature
☐ Local Data
☑ Expert Estimate

Geographic Range

This BpS lies in AR, LA, TX and southeast OK. The West Gulf Coastal Plain Pine-Hardwood Forest type is found over a large area of the South Central model zone. It is the predominant vegetation system over most of the Upper West Gulf Coastal Plain ecoregion with smaller incursions into the southern Interior Highlands. (Ecological Classification CES203.378). Includes ECOMAP section 231E and subsections 231Ea, 231Eg, 231Ef, 231Ek, 231Eb and 234Ec. In MZ45, this BpS is peripheral and occurs in south AR and north LA.

Biophysical Site Description

This BpS was historically present on nearly all uplands in the region except on the most edaphically limited sites (droughty sands, calcareous clays and shallow soil barrens/rock outcrops). Such sites are underlain by loamy to fine-textured soils of variable depths. These are upland sites on ridgetops and adjacent side slopes, with moderate fertility and moisture retention (Ecological Classification CES203.378).

Vegetation Description

This BpS consists of forests and woodlands dominated by shortleaf pine (Pinus echinata) and/or loblolly pine (P. taeda) in combination with a host of dry to dry-mesic site hardwood species at lesser prevalence (e.g., oak (Quercus spp), sweetgum (Liquidambar styraciflua) and hickory (Carya spp)). Overall this system may have supported relatively low levels of vascular plant species diversity. This system has undergone major transformations since European settlement of the region (e.g., conversion of BpS to pine plantations) (Ecological Classification CES203.378).

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**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

Disturbance Description

This BpS is Fire Regime Group 1. Naturally this system had frequent fire dominated by low intensity surface fire with occasional mixed fire in drought years and rare stand replacement fires in extreme dry years. Drought and moist cycles play a strong role interacting with both fire frequency and intensity. Other disturbance factors that played a smaller role included ice storms, wind events and insect infestations.

Adjacency or Identification Concerns

The BpS meets the oak-hickory-pine BpS along the southwestern edge of the Interior Highlands ecoregion (MZ44), and there may be some integration of this type into the lower areas of the Ouachita Mountains. Along the eastern border, the BpS also integrates with the bottomland hardwood systems of the MSRAP ecoregion (MZ45). Southern areas of the BpS have been reclassified as a separate longleaf pine (P. palustris)-dominated BpS. The West Gulf Coastal Plain Nepheline Syenite Glade system (CES203.371) is included within this BpS, and is limited to Pulaski and Saline County in AR.

Native Uncharacteristic Conditions

Large areas of this type have been converted to pure loblolly pine plantations and/or have been harvested or eliminated to make room for homes, development, etc.

Scale Description

Historically this BpS covered a very large and relatively contiguous area broken by smaller areas of pine flatwoods, bottomland sloughs and swamps, blackland prairies, saline barrens and river systems (e.g., Red River, Ouachita River and Saline River floodplain).

Issues/Problems

This model was copied from MZ45 by Brendan Ward on 8/23/07.

Comments

This model was created for MZ37 by Larry Threet and Mike Melnechuk and reviewed by Douglas Zollner.

For MZ45 this model was adopted from MZ37 without changes so no change in model author was made. This model was not reviewed for MZ45.

Vegetation Classes

Class A **10 %**

Early Development 1 All Structure

Upper Layer Lifeform

- ☐ Herbaceous
- ☑ Shrub
- ☐ Tree

Fuel Model 3

Indicator Species* and Canopy Position

PIEC2	All
PITA	All
QUERC	Middle
ANDRO2	Lower

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	0 %	100 %
Height	Shrub 0.6m	Shrub 1.0m
Tree Size Class	Sapling >4.5ft; <5"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

0-15yrs. Pine/oak regeneration with grass/forb regrowth. P. taeda, P. echinata, Quercus spp, mixed hardwood shrubs, blackberry (Rubus spp), various Andropogon spp, Carex spp and forbs with weedy component. Frequent surface fires (MFRI - five years) and occasional replacement fires (MFRI - 50yrs) are the disturbance factors in this class. Without fire for 10yrs this class succeeds to class B, otherwise it moves to class C.

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**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

Class B 10 %

Mid Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 9

Indicator Species* and Canopy Position

PIEC2	All
PITA	All
QUERC	Middle

Structure Data (for upper layer lifeform)

	Min	Max
Cover	71 %	100 %
Height	Tree 10.1m	Tree 25m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

15-40yrs. Mid-development class dominated by Pinus spp and mixed hardwood trees and shrubs. Dense overstory and midstory. Sparse understory with little to no herbaceous component. Frequent surface fires (MFRI - five years) maintain the class. Occasional mixed fires (MFRI - 25yrs), insect outbreaks (50 year interval), and rare wind or ice storms (250 year interval) take the class to C. Rare replacement fires (MFRI - 100yrs) move the class back to A. Class B succeeds to E.

Class C 20 %

Mid Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 2

Indicator Species* and Canopy Position

PIEC2	Upper
PITA	Upper
QUERC	Mid-Upper
ANDRO2	Lower

Structure Data (for upper layer lifeform)

	Min	Max
Cover	20 %	70 %
Height	Tree 10.1m	Tree 25m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

15-40yrs. Open mid-development class. Open canopy dominated by Pinus spp and fire-tolerant oak species. Open overstory and limited midstory. Continuous herbaceous component. Frequent surface fires (MFRI - five years) maintain the system at C until it succeeds to D. Rare replacement fires (MFRI - 100yrs) take the class back to A. Alternate succession (no fire for 10yrs) will cause a transition to class B.

Class D 55 %

Late Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 2

Indicator Species* and Canopy Position

PIEC2	Upper
PITA	Upper
QUERC	Upper
ANDRO2	Lower

Structure Data (for upper layer lifeform)

	Min	Max
Cover	20 %	70 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

40-500yrs. Mature open canopy mixed pine/mixed hardwood woodland to savanna. Depending on soil properties, pine or oak may be dominant canopy species. Very limited midstory (mixed hardwoods, little pine regeneration). Well developed herbaceous understory governed by percent canopy closure. Made up of diverse grass and forb species. Frequent surface fires (MFRI - five years) maintain the class at D. Occasional mixed fire (MFRI - 50yrs) will also maintain the class in D. Rare replacement events like fire and insct outbreaks (interval - 200yrs each) will move the class back to A. Alternate succession (no fire for 20yrs) will move this class to E.

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**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

Class E **5 %**

Late Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 8

Indicator Species* and Canopy Position

PITA	Upper
QUAL	Upper
CORNU	Middle
CAREX	Lower

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	71 %	100 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Large 21-33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

40-500yrs. Mature closed canopy loblolly pine/mixed hardwood forest. Dense midstory (mixed hardwoods, with some pine regeneration). Sparse shade-tolerant herbaceous understory. Mesic, seepage and swale areas. Frequent surface fires (MFRI - five years) maintain the class at E. Occasional mixed fire (MFRI - 50yrs) and minor insect outbreaks (66yrs) open the canopy and move the class to D. Rare replacement fire (MFRI - 100yrs) and major insect outbreaks (200yrs) will take the class back to A.

Disturbances

Fire Regime Group: I**

Historical Fire Size (acres)

Avg 1000
Min 100
Max 5000

Sources of Fire Regime Data

- ☑ Literature
- ☐ Local Data
- ☑ Expert Estimate

Fire Intervals

	Avg FI	*Min FI*	*Max FI*	*Probability*	*Percent of All Fires*
Replacement	130			0.00769	3
Mixed	66			0.01515	7
Surface	5			0.2	90
All Fires	4			0.22284	

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 inver 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.

Additional Disturbances Modeled

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

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**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

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LANDFIRE Biophysical Setting Model

Biophysical Setting 9813840 Mississippi Delta Maritime Forest

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

General Information

Contributors (also see the Comments field **Date** 2/9/2007

Modeler 1	Keith Fisher	keith_fisher@tnc.org	**Reviewer**
Modeler 2			**Reviewer**
Modeler 3			**Reviewer**

Vegetation Type
Forest and Woodland

Map Zone
98

Model Zone
☐ Alaska ☐ N-Cent.Rockies
☐ California ☐ Pacific Northwest
☐ Great Basin ☑ South Central
☐ Great Lakes ☐ Southeast
☐ Northeast ☐ S. Appalachians
☐ Northern Plains ☐ Southwest

Dominant Species*

QUMY	SERE2
QUGE2	MOCE2
CEER3	ARBE7
PIEL	MUHLE

General Model Sources
☑ Literature
☐ Local Data
☐ Expert Estimate

Geographic Range
East Gulf Coastal Plain Maritime Forest occurs on barrier islands and coastal zones along the northern Gulf of Mexico from the Florida Panhandle west to the mouth of the Mississippi River in LA (NatureServe 2006).

Biophysical Site Description
This biophysical setting occurs on stable dune and swale topography in somewhat more protected environments generally landward of the foredune, and transitional backdune zones of coastal beaches and barrier islands along the northern Gulf of Mexico. The system typically includes a series of stabilized dunes and interdunal swales oriented parallel to the coastline. Soils are primarily wind and wave deposited well drained, quartz sands of Appalachian origin (Drehle 1973, Johnson and Barbour 1990) that have been stabilized long enough to support trees and shrubs. As the forest establishes, soil temperature fluctuations moderate and humus begins to build up over the well drained sands; both contributing to moisture retention and more mesic conditions (FNAI 1990). Soil moisture is typically higher in swales.

Vegetation Description
Johnson and Barbour (1990) describe the vegetation of St. Vincent Island as representative of north gulf coastal systems. In this description maritime forest occurs on a series of ridges and swales landward of the primary dune and coastal grassland. The ridges are vegetated by a mix of low salt spray pruned oaks including myrtle oak (Quercus myrtifolia) and sand live oak (Q. geminata), rosemary (Ceratiola ericoides), saw palmetto (Serenoa repens), wax myrtle (Morella cerifera), woody goldenrod (Chrysoma pauciflosculosa) and false rosemary (Conradina canescens). Swales are vegetated by pine flatwoods communities with an overstory of slash pine (Pinus elliottii), and an understory of gallberry (Ilex glabra), saw palmetto, wax myrtle and fetterbush (Lyonia lucida).

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Huffman and Platt (2004) describe similar vegetation on Little St. George Island. They found scrub oaks (Quercus chapmanii, Quercus myrtifolia), conradina (Conradina canescens) and rosemary (Ceratiola ericoides) associated with slash pine on the dry dune ridges. The swales included an overstory of slash pine with a diverse herbaceous groundcover including muhly grass (Muhlenbergia filipes) and sawgrass (Cladium jamaicense). On larger coastal flats, mesic pine savannas included a well-developed herbaceous groundcover flora similar to mainland flatwoods with an abundance of saw palmetto (Serenoa repens), wiregrass (Aristida beyrichiana) and ericaceous shrubs (e.g., Vaccinium myrsinites).

NatureServe (2006) indicates this system encompasses a mosaic of woody vegetation present on barrier islands and near-coastal strands including forests and/or shrublands. Major associations include:
•Sand pine (Pinus clausa) / myrtle oak / sand live oak / false rosemary woodland
•Slash Pine / yaupon holly (Ilex vomitoria) / saw palmetto / wax myrtle woodland
•Slash pine / saw palmetto gallberry / wax myrtle / yaupon holly woodland
•Slash pine / saltmeadow cordgrass (Spartina patens) / black rush (Juncus roemerianus)/ switchgrass (Panicum virgatum) woodland
•Live oak (Quercus virginiana)/ sand pine / pignut hickory (Carya glabra) / sand hickory (C. pallida) / saw palmetto forest
•Live oak / sparkleberry (Vaccinium arboretum) / yaupon holly forest
•Live oak / slash pine / sabal palm (Sabal palmetto) / red bay (Persea borbonia) / beautyberry (Callicarpa americana) forest.

Disturbance Description

Maritime forest systems remain subject to periodic severe physical stresses, although less than coastal dune and grassland systems. Vegetation structure and composition are influenced by salt spray and extreme disturbance events such as hurricanes, erosion, accretion, and sand burial. The most heavily salt-influenced examples may appear pruned or sculpted (NatureServe 2006).

Hurricanes frequently make landfall in the northern Gulf of Mexico and have a significant impact on coastal systems. Even when they do not make landfall in the region, the storm surge and wave action generated by an off-shore storm can have a significant impact. A total of 112 hurricanes made landfall from Wakulla County, Florida to Hancock County, Mississippi during the period 1926 to 2005 (Jarrell et al. 1992 with updates). From the period 1851 to 2004, 36 major hurricanes (Category 3 or higher) made landfall along the Gulf Coast from Louisiana to the Florida Panhandle (Blake et al. 2005). Hurricane associated storm surges can overwash the dune system and cause significant erosion and/or sand burial of maritime forests. Personal observations along coastal areas of the Florida panhandle region in 2005 revealed large areas of vegetation extending several hundred yards inland that were killed or significantly impacted by salt water inundation.

The role of fire in this system is poorly documented. The majority of this system occurs on narrow barrier islands along the northern Gulf of Mexico. FNAI (1990) indicates that the mesic conditions and insular locations of well-developed Maritime Hammock communities inhibit natural fires, which occur no more frequently than once every 26-100yrs. Liu et. al. (2003), in their study of sediment cores from Little Lake, Alabama, suggested that wildfires have been common in the coastal ecosystems in Alabama, however, they offered no frequency estimates. They did suggest a correlation between hurricanes and fire. This correlation was also supported by Meyers and van Lear (1998) who suggest that hurricane-fire interactions once played a major role in the development of ecosystems in the southern US, influencing their composition, structure, and pattern on the landscape. Huffman and Platt (2004) in their

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dendrochronological study of fire scars on slash pines on Little St. George Island indicate that from 1866 to 1904, the mean fire return interval was four years and most fires occurred during the growing season (generally April through July). This was prior to significant human activity on the island. They could not locate any trees that established prior to 1853 on the island and postulated that many were destroyed by a hurricane in 1851, or a fire following the hurricane.

The following fire return interval estimates were based on the Huffman and Platt study and the return interval in similar ecological systems on the mainland. Pine dominated swales and flats most likely burned more frequently than the oak/rosemary dominated ridges. Fires were primarily light surface fires occurring every four years during the growing season. More intense replacement fires may have occurred following hurricanes, when more fuel was available as a result of storm damage. There is little fuel to sustain surface fires in the oak/rosemary dominated ridges. Fires in this vegetation type are typically replacement fires that burn through the shrub crowns. The return interval here was estimated at 25-100yrs, and may have occurred following a hurricane or other intense storm related event when more fuel was available and fire intensity was higher.

Adjacency or Identification Concerns

Shrub dominated portions of this system may also be called coastal strand. Tree dominated portions may also be called coastal or maritime hammock. Pine dominated sections may be called pine flatwoods.

Coastal development and alterations including real estate development, beach armoring, beach re-nourishment and erosion are also a significant threat to this ecological system. Morton et al. (2004) indicates large portions of the gulf shoreline are eroding at average long-term rates as high as 1-3 m/yr, despite beach armoring and re-nourishment efforts.

Native Uncharacteristic Conditions

Scale Description

This system is restricted primarily to linear coastal barrier islands along the northeastern Gulf of Mexico coast. The width of this linear system is unknown. The Gulf coast of FL (including the peninsular region), Alabama and MS includes approximately 630 linear miles of barrier island (US Army Corps of Engineers 2002).

Disturbances, particularly large storms, can affect a high percentage of this system at one time. The impact of fire on this system is poorly documented.

Issues/Problems

Limited information describing the frequency of fire or fire effects on this system could be located, particularly on the scrub dominated dune ridges.

Comments

This model was created for MZ99 by Keith Fisher and reveiwed by Chris Szell.

For MZ98 this model was adopted and Maria Melnechuck made minor text edits. Because change were minor and only descriptive, model author was not changed for MZ98. No review was obtained for this model in MZ98.

Vegetation Classes

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Class A 20 %

Early Development 1 All Structure

Upper Layer Lifeform

- ☐ Herbaceous
- ☑ Shrub
- ☐ Tree

Fuel Model 7

Indicator Species* and Canopy Position

QUMY	Low-Mid
PIEL	Low-Mid
SERE2	Low-Mid
ARBE7	Lower

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	0 %	30 %
Height	Shrub 0.6m	Shrub 1.0m
Tree Size Class	Seedling <4.5ft	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Class A includes herbs, shrubs and seedling trees recovering from 0-15yrs post disturbance. This class may occur following a disturbance such as a hurricane, sand burial, overwash or a fire event. Vegetation resprouts from roots, corms or seeds. On the oak/rosemary dominated dune ridges, the dominant vegetation in class A is the resprouting shrubs which may comprise up to 30% cover. In the pine dominated swales and flats the dominant vegetation in class A is the herbaceous groundcover and resprouting shrubs.

Hurricanes and other wind/weather related disturbances may impact this class several times per century, either through sand burial, overwash or erosion. Light surface fires probably occurred in the pine dominated swales every four years. Replacement fires were less frequent in the pine dominated swales, and probably occurred following a hurricane event that increased the amount of downed available fuel. This was estimated to occur once every 100yrs. The probability of the oak/rosemary dominated dune ridges burning in this class are low due to the lack of fine fuels and low fuel continuity. Alternate sucession was used to represent the percent of class A in the oak/rosemary dominated dune ridge association that will transition to class B (50%).

Class B 10 %

Mid Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☑ Shrub
- ☐ Tree

Fuel Model 4

Indicator Species* and Canopy Position

QUMY	Upper
QUGE2	Upper
CEER3	Upper
SERE2	Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	51 %	70 %
Height	Shrub 1.1m	Shrub >3.1m
Tree Size Class	None	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Class B includes oak/rosemary dominated scrub on dune ridges from 16-40yrs old. Some examples may include sand pine in the overstory. Canopy closure is generally between 50-75%. Examples occurring close to the primary dune line on more exposed aspects typically develop a low, dense, salt pruned canopy. Examples in more protected environments develop more vertically, but retain a dense canopy.

Surface fires generally will not occur or will cause little effect in this association because very little fine fuel is available. Replacement fires may occur as often as every 100yrs, typically following a hurricane. Hurricanes and other wind/weather related disturbances may impact this class several times per century, either through sand burial, overwash, or erosion, returning it to class A.

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Class C 45 %

Mid Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 7

Indicator Species* and Canopy Position

PIEL	Upper
SERE2	Low-Mid
ARBE7	Lower
ILGL	Low-Mid

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	31 %	50 %
Height	Tree 5.1m	Tree 10m
Tree Size Class	Pole 5-9" DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Class C includes trees 16-60yrs old in the swales and larger coastal flats with an understory of scattered shrubs and grasses or other herbs. Canopy closure is generally between 30-50%. The stand experiences a light surface fire every four years which maintains an open, diverse understory of scattered low shrubs and grasses. Replacement fires may occur every 150yrs, typically following a hurricane. Hurricanes and other wind/weather related disturbances may impact this class several times per century, either through sand burial, overwash, or erosion, returning it to class A. Chronic weather related disturbances help maintain the open nature of the stand and were not considered a distinct disturbance event.

Class D 20 %

Late Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 7

Indicator Species* and Canopy Position

PIEL	Upper
SERE2	Low-Mid
ARBE7	Lower
ILGL	Low-Mid

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	31 %	50 %
Height	Tree 10.1m	Tree 25m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Class D includes trees greater than 60yrs old in the swales and larger coastal flats with an understory of scattered shrubs and grasses or other herbs. Canopy closure is generally between 30-50%. The stand experiences a light surface fire every four years which maintains an open, diverse understory of scattered low shrubs and grasses. Replacement fires may occur every 150yrs, typically following a hurricane. Hurricanes and other wind/weather related disturbances may impact this class several times per century, either through sand burial, overwash, or erosion, returning it to class A. Less intense hurricanes occur more frequently and may snap off or down older trees, returning the stand to class C (possilby every 20yrs). Chronic weather related disturbances help maintain the open nature of the stand and were not considered a distinct disturbance event.

Class E 5 %

Late Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 9

Indicator Species* and Canopy Position

QUGE2	Upper
CAGL8	Upper
SERE2	Low-Mid
ILVO	Low-Mid

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	71 %	100 %
Height	Tree 10.1m	Tree 25m
Tree Size Class	Large 21-33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

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Class E represents an advanced stage of the oak dominated scrub association that occurs in areas protected from coastal influences and fire. Trees are greater than 40yrs old and have developed a dense, almost continuous canopy. Canopy closure is generally >75%. Other tree species may occur in the canopy including pignut hickory, red bay and sabal palm. Understory vegetation may include saw palmetto, yaupon holly, beautyberry, sparkleberry and others. The ground cover vegetation is poorly developed.

Surface fires generally do not occur or cause little effect in this association because very little fine fuel is available. Replacement fires may occur every 200yrs, typically following a hurricane that increases the amount of fuel available. Hurricanes may have the greatest impact to this association. Category 4 or 5 storms several times per century may return the stand to class A. More frequent but less intense storms may snap off or down older trees, returning the stand to class B (possibly every 20yrs).

Disturbances

Fire Regime Group:** I

Historical Fire Size (acres)

Avg 0
Min 0
Max 0

Sources of Fire Regime Data

- [x] Literature
- [ ] Local Data
- [ ] Expert Estimate

Fire Intervals	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
Replacement	120	25	150	0.00833	4
Mixed					
Surface	5	3	5	0.2	96
All Fires	5			0.20834	

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 inver 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.

Additional Disturbances Modeled

- [ ] Insects/Disease
- [x] Wind/Weather/Stress
- [ ] Native Grazing
- [ ] Competition
- [ ] Other (optional 1)
- [ ] Other (optional 2)

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LANDFIRE Biophysical Setting Model

Biophysical Setting 9814340 Texas-Louisiana Coastal Prairie

☑ *This BPS is lumped with: 1487*

☐ *This BPS is split into multiple models: BpS 1434 is systematically lumped with 1487. BpS 1487 is too fine for mapping and modeling.*

General Information

Contributors (also see the Comments field **Date** 1/24/2007

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Vegetation Type

Upland Grassland/Herbaceous

Map Zone

98

Model Zone

☐ Alaska ☐ N-Cent.Rockies
☐ California ☐ Pacific Northwest
☐ Great Basin ☑ South Central
☐ Great Lakes ☐ Southeast
☐ Northeast ☐ S. Appalachians
☐ Northern Plains ☐ Southwest

Dominant Species*

ANGE	TRDA3
SCSC	PAHE2
PAVIS	SONU2
SPSP	MOCE2

General Model Sources

☐ Literature
☑ Local Data
☑ Expert Estimate

Geographic Range

This BpS encompasses non-saline tallgrass prairie vegetation ranging along the coast of LA and TX. This coastal prairie region once covered as much as nine million acres (Grace 2000). The prairie region of southwestern LA was once extensive (~ 2.5 million acres) but today is limited to small, remnant parcels (100-1000ac). Gulf Coast and inland varying distances from 50-150 miles (80-240 km) from south TX to LA and the mouth of the Mississippi River. In LA, it is bordered to the north and east by Southern Floodplain Forest (Kuchler 1964). To the south and west it also joins with the desert grasslands.

This BpS is found in MZ37 in ECOMAP subsections 232Ea and 232Eb.

Biophysical Site Description

This BpS is found on Vertisols and Alfisols which developed over Pleistocene terraces flanking the Gulf Coast. It is often characterized by a ridge-and-swale or mound-and-intermound microtopography and encompasses both upland and wetland plant communities. The bluestem-sacahuista is relatively flat, but is characterized by ridge-swale or mound-intermound microtopography. This type is dissected by numerous rivers and streams which result in highly variable species composition (Johnston 1963, Diamond and Smeins 1985, Drawe 1994).

A topographic and moisture gradient exists as one progresses inland and out of floodplains. The diversity of embedded edaphic conditions and wetlands within the general type is important and interacted with fire to determine wildlife species distributions. Extended inundation in areas referred to as lagunas adds a disturbance element within 25km of the coast. These areas are subject to a different successional pattern

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than that following other types of disturbance (Scifres and Mutz 1978).

Vegetation Description

Upland dominants include little bluestem (Schizachyrium scoparium), brownseed paspalum (Paspalum plicatulum), Indiangrass (Sorghastrum nutans) and big bluestem (Andropogon gerardii). Wetland dominants in undisturbed occurrences include switchgrass (Panicum virgatum) and eastern gamagrass (Tripsacum dactyloides); disturbed occurrences may be dominated by bushy bluestem (A. glomeratus). 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 1000 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). The species composition is dominated by little bluestem, sea coast bluestem (S. c. var. littoralis), several Panicums and sacahuista, also known as Gulf cordgrass (Spartina spartinae). Sacahuista (Nolina spp) primarily dominates along floodplains of the numerous rivers and near the coast. Other important species include bushy bluestem, other bluestems such as split-beard (A. ternarius), broomsedge bluestem (A. virginicus), silver bluestem (Bothriochloa saccharoides), various Sporobolus spp and several tropical grasses of the genera Heteropogon, Paspalum, Trachypogon and the previously mentioned Panicum. 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-likes that are important include sedges (Carex spp), spikerush (Eleocharis spp) and Scirpus spp. Conspicuous forbs include the genera Ratibida (prairie coneflower), Rudbeckia (coneflower), Liatris (blazing-stars) and Sagittaria (arrowhead). Shrubs that are important include honey mesquite (Prosopis glandulosa) and various acacias most notably huicache (Acacia farnesiana) in Texas, also Macartney rose (Rosa bracteata) and various oaks (Quercus spp). Eastern baccharis (Baccharis halimifolia) and wax myrtle (Morella cerifera) are more important to the east. All of these woody plants and others increase in the absence of fire.

Disturbance Description

Fire (lightning and anthropogenic) occurs about 2-5 times every 10yrs. In the absence of regular fire, this system will be invaded by woody shrubs and trees. Disturbance sizes were estimates based on landscape size and should be reviewed. This type is fire regime group II, with frequent replacement fires, both lightning and anthropogenic in origin (Stewart 1951, Lehmann 1965, Drawe 1980, Stewart 2002; Jurney 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 dependent on the availability of dry fine fuels sufficient to carry a fire. Historic accounts from the 1800s 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.

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). Bison (Bison bison) were historically an important source of disturbance that increased heterogeneity of patches on the landscape. Wild horses

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were established early on and large herds were noted by early explorers in the southwestern part of this type (Stewart 2002). Pronghorn (Antilocapra americana) 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, bison herds were of smaller size and more dispersed in this system 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 20,000ac (8094ha) 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).

Adjacency or Identification Concerns

In LA this system grades coastward into marshes of the chenier plain and inland into West Gulf Coastal Plain Wetland Longleaf Savanna and Flatwoods (CES203.191). In TX this system generally grades coastward into a saline prairie or salt marsh system and inland into West Gulf Coastal Plain Wetland Longleaf Savanna and Flatwoods (CES203.191), or oak woodland vegetation. Relatively undisturbed natural depressions (potholes) occurring within the upland matrix units of this system are included in West Gulf Coastal Plain Texas-Louisiana Coastal Prairie Pondshore (CES203.541; BpS 1487). Current conditions of the coastal prairie are changed by the lack of fire use, which in turn allows invasive woody species (Chinese tallow, wax myrtle, swamp privet and eastern baccharis).

Native Uncharacteristic Conditions

Overgrazing, fire-exclusion and associated woody encroachment; conversion to agriculture.

Scale Description

Burned and unburned patches mainly 100-1000ac in size. Grazing patches follow burned patches on the landscape. Burned patches may remain open for 0-1yrs; grazing will prolong this open state.

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Issues/Problems

Some estimates state that 99% of coastal prairie has been lost through conversion to other uses and environmental degradation due to the interruption of important ecological processes, such as fire / grazing, needed to maintain this system.

Imported from z37 by Brendan Ward on 8/23/07.

Comments

Vegetation Classes

Class A 25 %

Early Development 1 All Structure

Upper Layer Lifeform

- [x] Herbaceous
- [ ] Shrub
- [ ] Tree

Fuel Model 1

Indicator Species* and Canopy Position

ANGE	Upper
FORBS	Mid-Upper
SCSC	Upper
SPSP	Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	70 %
Height	Herb 0m	Herb 0.5m
Tree Size Class	None	

- [ ] Upper layer lifeform differs from dominant lifeform.

Description

0- 1yrs. Open. Burned in last year. 'Sweet' regrowth that may occasionally be grazed (local intensive grazing). Cover of bare ground, forbs and annuals will be higher in this open box. 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. Transition to class B the following year. Grazing by bison and also herbivory by geese will occur frequently in this class (every three years in the model) since the regrowth is the ideal food source for nutrition. Flooding (every 10yrs) will maintain this class.

NOTE -- most of the grazing will occur in this box. Native ungulates will concentrate on recently burned patches. Although ecologically very important grazing not included in this model because it would be closely associated (spatially and temporally) with burned patches.

Class B 60 %

Mid Development 1 Closed

Upper Layer Lifeform

- [x] Herbaceous
- [ ] Shrub
- [ ] Tree

Fuel Model 3

Indicator Species* and Canopy Position

SCSC	Upper
PAVI2	Upper
ANGE	Upper
SONU2	Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	71 %	100 %
Height	Herb 0.6m	Herb >1.1m
Tree Size Class	None	

- [ ] Upper layer lifeform differs from dominant lifeform.

Description

Closed. Two years plus old with disturbance. Mix of live and standing dead herbaceous biomass. Cover dominated by grasses. This class remains in class B until replacement fire takes it to class A (every four years). Grazing by bison and also herbivory by geese will occur frequently in this class (every three years in the model) since the regrowth is the ideal food source for nutrition. Flooding will maintain this class (10yr interval). This class moves class to C without fire.

NOTE -- grazing is not explicitly included in this model. Local grazing would lengthen the fire return

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interval. This model assumes an intact grassland landscape with episodic (not chronic) grazing pressure.

Class C 5 %

Mid Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☑ Shrub
- ☐ Tree

Fuel Model 3

Indicator Species* and Canopy Position

ANGE	Mid-Upper
SPSP	Mid-Upper
MOCE2	Upper
BAHA	Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	31 %	60 %
Height	Shrub 0m	Shrub 3.0m
Tree Size Class	None	

☑ Upper layer lifeform differs from dominant lifeform.

Grass will still be the dominant type however shrubs will be increasing without disturbance.

Description

3-6yrs old without disturbance (fire after eight years). Replacement fire every five years moves to class A. Flooding events every 10yrs moves the class to B. 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. Can go from tree seedling/sapling to large trees (D class). Three meters is taller than the species actually get in this class - maximum height is probably closer to two meters.

Class D 10 %

Late Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☑ Shrub
- ☐ Tree

Fuel Model 4

Indicator Species* and Canopy Position

MOCE2	Upper
BAHA	Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	61 %	100 %
Height	Shrub 1.1m	Shrub 3.0m
Tree Size Class	None	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Eight years plus. Closed. 'Un-burned' greater than six years old. The grass component is reduced or eliminated by the shrub canopy closure. Moderate intensity mixed fire will move this class to C (10yr interval).

Class E 0 %

[Not Used] [Not Used]

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☐ Tree

Fuel Model

Indicator Species* and Canopy Position

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	%	%
Height		
Tree Size Class		

☐ Upper layer lifeform differs from dominant lifeform.

Description

Disturbances

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Fire Regime Group:** II

Historical Fire Size (acres)

Avg 500
Min 10
Max 10000

Sources of Fire Regime Data

- ☐ Literature
- ☐ Local Data
- ☑ Expert Estimate

Fire Intervals	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
Replacement	5	1	6	0.2	95
Mixed	100			0.01	5
Surface					
All Fires	5			0.21001	

Fire Intervals (FI):

Fire interval is expressed in years for each fire severity class and for all types of fir combined (All Fires). Average FI is central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inver 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.

Additional Disturbances Modeled

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

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LANDFIRE Biophysical Setting Model

Biophysical Setting 9814510 West Gulf Coastal Plain Wet Longleaf Pine Savanna and Flatwoods

☑ *This BPS is lumped with: 1462*

☐ *This BPS is split into multiple models: BpS 1451 is systematically lumped with 1462. BpS 1462 is too fine for mapping and modeling and may also occur with 1474. Bayheads found along streams included as small patch.*

General Information

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Vegetation Type

Forest and Woodland

Map Zone

98

Model Zone

☐ Alaska ☐ N-Cent.Rockies
☐ California ☐ Pacific Northwest
☐ Great Basin ☑ South Central
☐ Great Lakes ☐ Southeast
☐ Northeast ☐ S. Appalachians
☐ Northern Plains ☐ Southwest

Dominant Species*

PIPA2 ANVI2
SCHIZ4
SCSC
ANDRO

General Model Sources

☑ Literature
☐ Local Data
☑ Expert Estimate

Geographic Range

These systems were historically common in the TX and LA Southwest Flatwoods Subregion (The Nature Conservancy of Texas 2001), although only a few remnants remain today. Wet longleaf pine woodlands occur mainly on Pleistocene-aged formations in the southern part of the west gulf coastal plain ecoregion on poorly drained to moderately permeable sandy loam to clay loam. The most extensive wetland pine savannas are found on the Montgomery Formation of the Pleistocene epoch. Found in MZ37 in ECOMAP subsections 232Ea, 232Fa, 232Fb, 232Fe and 232Ff.

Biophysical Site Description

The term "savanna" is classically used to describe expansive herb-dominated areas with scattered trees. Wet longleaf pine woodlands are characterized by fine-textured soils, nearly featureless plains, and streams with broad, shallow valleys and poorly defined drainages. Much of the landscape exhibits undulating micro-topography, including seasonally flooded depressional areas (sometimes referred to as flatwoods ponds) and pimple mounds. Drainage mottles occur in the subsoil, with most exhibiting the gray coloration characteristic of anoxic soil conditions. The nearly level topography and lack of well-defined drainages, combined with an impermeable subsurface soil layer (hardpan), result in soils that are seasonally saturated, especially in winter and spring. During summer and fall, the moderately permeable surface soils tend to become droughty. Soils are hydric, strongly acidic, nutrient poor, fine sandy loams and silt loams, low in organic matter. There is a western LA variant on saline soil termed Brimstone silt loam.

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Vegetation Description

Common woody species include Pinus palustris (longleaf pine, usually predominant tree species), Magnolia virginiana (sweet bay), Nyssa sylvatica (black gum), Quercus virginiana (live oak), Q. marilandica (blackjack oak), Q. laurifolia (laurel oak), Cyrilla racemiflora (swamp cyrilla), Morella cerifera (wax myrtles), Hypericum spp (St. John's worts) and Styrax americana (littleleaf snowbell).

Pine savannas possess a high level of herbaceous biodiversity dominated by graminoids, similar to that occurring in hillside bogs. Graminoids present include Andropogon spp (broomsedges), Schizachyrium scoparium and S. tenerum (little and slender bluestem), Panicum spp (panic grasses), Aristida spp (three-awn grasses), Ctenium aromaticum (toothache grass), Muhlenbergia capillaris (hairawn muhly), Erianthus spp (plume-grasses), Coelorachis spp (jointgrasses), Rhynchospora spp (beak-rushes), Xyris spp (yellow-eyed grasses), Fuirena spp (umbrella grasses), Scleria spp (nut-rushes), Dichromena latifolia (giant white top sedge), Eriocaulon spp (pipeworts), Lachnocaulon spp (bog buttons) and Fimbristylis spp (fimbry-sedge). Some forbs common in the community include Sarracenia spp (pitcher plants), Agalinis spp (gerardias), Lobelia spp (lobelias), Rhexia spp (meadow beauties), Eryngium integrifolium (bog thistle), Oxypolis filiformis (narrow-leaved hog-fennel), Polygala spp (milkworts), Liatris spp (blazing-stars), Sabatia spp (rose-gentians), Drosera spp (sundews), Pinguicula spp (butterworts), Marshallia tenuifolia (thin-leaved barbara's-buttons, southwestern Louisiana), Utricularia spp (bladderworts) and Platanthera spp (fringed-orchids). Various additional species belonging to the lily family (Liliaceae), sunflower family (Asteraceae) and orchid family (Orchidaceae) are prominent. Lycopodium spp (club-mosses) and sphagnum moss are often abundant. Fire frequency is a major factor controlling species occurrence and community structure. Without frequent fire (preferably growing season burns which mimic historic fire regimes), deciduous shrubs and trees gain dominance and out-compete herbaceous flora. Additional inclusions in the community, include "flatwood ponds" and "baygalls".

Disturbance Description

Frequent fires, seasonal wetness and low nutrient availability of this ecosystem inhibit the establishment of woody understory species and maintain a sparse canopy of longleaf pine. Since natural fire breaks are few on this landscape, low-intensity surface fires burn frequently (fires every 1-4yrs) primarily during the growing season. This frequent fire regime is necessary to maintain the open savanna condition and provides bare ground for longleaf pine regeneration. Generally, these surface fires consume herbaceous and shrub fuels, but rarely harms the larger more established trees. Long fire return intervals (10yrs+) will lead to significant woody encroachment of shrubs and fire-intolerant trees. This condition can also lead to increased fuel loading that will put the larger, more established trees at risk due to hotter, less frequent fires. Repeated moderate intensity fires can force the "woody encroachment" state to the "open savanna" state.

Years of altered fire regime will result in a shift in species composition and vegetation structure. Woody shrubs rather than herbaceous species dominate the understory. Structural changes may include dense stands of small-diameter brush, with an increase in the potential for catastrophic wildfires. Prescribed fire has been used as an attempt to reverse the effects of decades of fire suppression. However, the results of these attempts have been mixed. Uncertainty remains over the frequency of burning necessary to restore fire-dependent ecosystems, however a return frequency of every 2-5yrs appears best. Application of burns is often too infrequent, allowing woody understory species to crowd out longleaf or, in hardwood forests, oaks, beeches and other dominant trees. Similarly, burns are ineffective if applied at the wrong life stage of plants, or at the wrong point in the growing season. An example: late spring to early summer burns favor longleaf and associated herbaceous plants, whereas late-season or winter burns favor woody shrubs. However, prescribed burns, properly applied, are a crucial restoration and management tool in the

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pyrogenic longleaf pine ecosystems. Canopy gaps are created by fire mortality, lightning and wind throw from hurricanes and tornados. These "gaps" are represented under structural stage A of the model. Palik and Pederson (1996) report patch disturbances removed 550-1300 square meters (0.14-0.32ac) of exposed crown area to form openings 1000-2000 square meters (0.25-0.5ac); but occur only once per 1000 ha in five years. Wind/Weather/Stress disturbances are characterized by hurricane and tornado occurrences. Damaging ice storms are also a weather factor but to what degree is unknown.

Adjacency or Identification Concerns

This BpS represents the presumed matrix vegetation of the outer (seaward) portions of the West Gulf Coastal Plain in LA and eastern TX, on relatively recent (Pleistocene) geologic formations within the range of longleaf pine. Within the range of longleaf pine, this BpS is adjacent to West Gulf Coastal Plain Upland Longleaf Pine Forest and Woodland.

Native Uncharacteristic Conditions

Uncharacteristic vegetation types include even-aged canopy stands in which age structure has been homogenized by logging or clearing, and establishment of monoculture pine plantations. Examples are found where loblolly pine (P.taeda), shortleaf pine (P. echinata), slash pine (P. elliottii) or oaks (Quercus spp.) have replaced some or all of the longleaf pine, and 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. In the absence of fire, shrub or mid-story hardwood densities increase.

Scale Description

Large patch.

Issues/Problems

Drainage of these wetlands for real estate development and pine plantations is endangering this ecosystem far more than the lack of fire and the subsequent progression of plant succession.

The proliferation of both invasive native and exotic vegetation is a negative impact on this ecosystem. Some native plants can be problematic in the absence of natural processes like fire. For example, yaupon holly (Ilex vomitoria) has crowded out other natives and becomes a dominant understory plant in some fire-suppressed areas. Most invasives are extremely difficult and costly to control once established. Other invasives already well-established include Chinese tallow tree (Triadica sebifera), feral hog (Sus scrofa) and non-native fire ants (Solenopsis invicta).

Imported from z37 by Brendan Ward on 8/23/07

Comments

From "The Natural Communities of Louisiana, Louisiana Natural Hertitage Program, Louisiana Department Wildlife & Fisheries"

Vegetation Classes

*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
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Class A 15 %

Early Development 1 All Structure

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 3

Indicator Species* and Canopy Position

PIPA2	Upper
ANVI2	Upper
SCSC	Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	0 %	30 %
Height	Tree 0m	Tree 5m
Tree Size Class	Sapling >4.5ft; <5"DBH	

☑ Upper layer lifeform differs from dominant lifeform.

The dominant lifeform is herbaceous, mainly native grass species.

Description

0-20yrs. Class A includes canopy gaps, mostly from a single tree to a quarter acre in size, with pine regeneration up to 15yrs old (or pine absent). The ground cover is predominantly native grasses. Longleaf regeneration cover can range from 0-30%. The higher percentages are local situations. Dominant lifeform is herbaceous. Longleaf pine present in grass stage and young saplings only. Frequent surface fires at three year intervals create opportunities for longleaf pines to escape their prolonged juvenile stage (to class C). Fire exclusion leads to class B after six years, an 'alternate succession' pathway associated with increased cover of fire-sensitive woody species.

Class B 10 %

Mid Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 7

Indicator Species* and Canopy Position

PIPA2	Upper
CYRA	Low-Mid
SCSC	Lower
ILVO	Low-Mid

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	61 %	80 %
Height	Tree 5.1m	Tree 25m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Class B is the closed "shrub/woody encroachment box" with infrequent fire. Tree encroachment will follow with continued fire exclusion over time. (This class includes bayheads that are found along streams and are naturally wet enough to exclude fire.) Ages 21-50yrs. Replacement fires (every 50yrs) will force this class back to class A. Mixed fires every 20yrs move the class to C.

Class C 25 %

Mid Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 2

Indicator Species* and Canopy Position

PIPA2	Upper
ANVI2	Lower
SCSC	Lower
	Lower

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	0 %	60 %
Height	Tree 5.1m	Tree 25m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Class C is characterized by patches, most ¼ acre or less, of canopy pines 21-50yrs old. With time (15yrs), this class will mature to class D. Frequent surface fires in the herbaceous layer maintains this class (two year interval). Rare replacement fires (100yr interval) take the class back to A.

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*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

Class D 47 %

Late Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 2

Indicator Species* and Canopy Position

PIPA2	Upper
ANVI2	Lower
SCSC	Lower

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	0 %	70 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Large 21-33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Class D includes canopy pines 51yrs+ old. The ground cover is dominated by grasses. The pine canopy cover ranges from 25-75%. Frequent surface fire (every two years) in the herbaceous layer maintains this class. This class moves to E with lack of fire after 15yrs. Rare replacement fires (100yr interval) take the class back to A. Severe wind/weather events are rare (every 100yrs) and move the class to A.

Class E 3 %

Late Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 4

Indicator Species* and Canopy Position

PIPA2	Upper
LIST	Mid-Upper
ILVO	Low-Mid
NYSY	Mid-Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	71 %	90 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Large 21-33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Class E includes patches, most ¼ acre or less, with canopy pines 51yrs+ old. The ground cover consists of pine litter with sparse grasses and herbs. The shrub layer and lower midstory consists of dense to moderately open shrub thickets and sapling trees. Common species in this layer are Pinus taeda (loblolly pine), Nyssa sylvatica (black gum), sweet gum, Acer rubrum (red maple), Q. falcata (southern red oak), Q. Nigra (water oak), Q. laurifolia (laurel oak), Q. Stellata (post oak), Ilex vomitoria (yaupon), Morella cerifera (wax myrtle), etc. The overstory consists of longleaf with emerging loblolly, water oak and sweetgum. Rare replacement fires and severe wind/weather events (every 100yrs) and move the class to A. Mixed fires occur every 50yrs and move the class to D.

Disturbances

Fire Regime Group: I

Historical Fire Size (acres)

Avg 1000
Min 100
Max 10000

Sources of Fire Regime Data

- ☑ Literature
- ☐ Local Data
- ☑ Expert Estimate

Fire Intervals

	Avg FI	*Min FI*	*Max FI*	*Probability*	*Percent of All Fires*
Replacement	138			0.00725	2
Mixed	178			0.00562	2
Surface	3	1	5	0.33333	96
All Fires	3			0.3462	

Fire Intervals (FI):

Fire interval is expressed in years for each fire severity class and for all types of fir combined (All Fires). Average FI is central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inver 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.

*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

Additional Disturbances Modeled

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

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*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

LANDFIRE Biophysical Setting Model

Biophysical Setting 9814580 West Gulf Coastal Plain Pine-Hardwood Flatwoods

☑ *This BPS is lumped with: 1402*

☐ *This BPS is split into multiple models: BpS 1458 is systematically lumpped with 1402. BpS 1402 is too fine for mapping and modeling.*

General Information

Contributors (also see the Comments field **Date** 1/25/2007

Modeler 1	Mike Melnechuk	mmelnechuk@tnc.org	**Reviewer**
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Modeler 3			**Reviewer**

Vegetation Type

Forest and Woodland

Map Zone

98

Model Zone

☐ Alaska ☐ N-Cent.Rockies
☐ California ☐ Pacific Northwest
☐ Great Basin ☑ South Central
☐ Great Lakes ☐ Southeast
☐ Northeast ☐ S. Appalachians
☐ Northern Plains ☐ Southwest

Dominant Species*

PITA	QUPH
QUFA	PIEC2
QUST	PIPA2
QUNI	ANTE2

General Model Sources

☑ Literature
☐ Local Data
☑ Expert Estimate

Geographic Range

This type lies in parts of AR, LA and TX, especially in ECOMAP subsections 231Ec, 231Ea, 234Ec and small portions of 231Ej.

Biophysical Site Description

This BpS is situated on second and third Pleistocene Terraces above larger drainages. Lower levels are flooded at varying frequencies. These terraces are often topographically flat. Clayey subsoils lead to formation of permanent and semi-permanent wetlands. Mima mounds are also present in some situations. The Deweyville Terrace Pine Flatwoods (DPFW) also lie within this type. Pine flatwoods generally occur on the middle and highest Deweyville terraces in the study area, on Guyton and Pheba soils. The lower (and younger) Deweyville surfaces that occur below 26m (87ft) mean sea level (msl) are subject to Ouachita or Saline River flooding at least once every ten years, on average, but their wetland character is primarily maintained by precipitation. Above 26 msl, precipitation is the sole source of wetland hydrology in the pine flatwoods. Guyton soils occur in units of 10-400ha. These soils are level and poorly drained. Guyton silt loam soils have water tables within 30cm of the surface during the winter and early spring. Topographically lower areas of Guyton also experience periodic flooding during the winter and spring. On the higher Deweyville terraces, pine flatwoods occur primarily on Pheba silt loam, which has a seasonal water table perched above the fragipan during periods of high rainfall. The fragipan restricts water movement and root penetration. Since higher Deweyville sublevels are flatter and more poorly drained than the lower sublevels, they are marginal for pine flatwoods except on topographically higher rises of Pheba soil. This is in contrast to the Prairie Terrace Pine Flatwoods, where the higher sublevels are more dissected and better drained. Soils may be named or classified differently in Louisiana.

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DPFW represent a transition from a pine-dominated terrace type to floodplain bottomland hardwood forest. The lower sublevels (the lowest and part of the next higher) are within the current floodplain of the Ouachita River and are primarily bottomland hardwood forest (BLH), whereas the upper part of the second sublevel and the highest sublevel are outside the current floodplain and are dominantly pine or pine-hardwood. As a result many species occur on both the DPFW and the floodplain BLH communities. Delta post oak (Quercus similis) is much more common on the Deweyville than on the Prairie terrace here, as is dwarf palmetto (Sabal minor). The presence of laurel oak (Q. laurifolia) in vernal pools on the DPFW also indicates overlap between the DPFW and floodplain BLH. It is not uncommon to see loblolly pine (Pinus taeda), baldcypress (Taxodium distichum), overcup oak (Q. lyrata) and dwarf palmetto growing side by side in DPFW.

Prairie Terrace Pine Flatwoods (PPFW)
PPFW are located on the lowest, youngest, and least dissected of the Prairie Terrace sublevels (which are much older than Deweyville terraces and occupy a higher landscape position). More dissected higher levels are naturally occupied by upland hardwood and pine-hardwood forest and woodland. The soils on the PPFW sites are Amy and Pheba silt loams. Amy map units are 10 to 400 ha in size. Pheba map units occur on slightly higher prairie terrace surfaces, and are only 5 to 20 ha in size and occupy only a small portion of the total landscape.

Areas that are located on Amy silt loam soil are extremely wet, due to a seasonal high water table within 30 cm of the surface during the winter and spring. Areas that are located on Pheba silt loam have a seasonal water table that is perched above the fragipan during periods of high rainfall. The fragipan restricts water movement and root penetration and causes a hydroxeric alteration, as described before.

Vegetation Description

The typical dominant overstory species is loblolly pine (Pinus taeda) with willow oak (Quercus phellos) in wetter flats and southern red oak (Q. falcata) and post oak (Q. stellata) or Delta post oak on well-drained surfaces. Shortleaf pine (P. echinata) can occupy some part of the canopy and sub-canopy in the northern part of range, while longleaf pine (P. palustris) can occupy some part of the canopy and sub-canopy in the southern part of the range. In a few places, such as near Goldonna, LA, these pines along with loblolly will co-occupy the canopy. Depending on disturbance history, sub-canopy species can include recruitment species from the canopy, as well as mockernut hickory (Carya alba), black hickory (C. texana), sweetgum (Liquidambar styraciflua), slippery elm (Ulmus rubra) sassafras (Sassafras albidum), white ash (Fraxinus americana) and black gum (Nyssa sylvatica). Mid-story and shrub species include those listed above as well as flowering dogwood (Cornus florida), red maple (Acer rubrum), Mexican plum (Prunus mexicana), sourwood (Oxydendrum arboreum), wax myrtle (Myrica cerifera), French mulberry (Callicarpa americana), rusty blackhaw (Viburnum rufidulum), various hawthorns (Crataegus spp), Male-berry (Lyonia ligustrina), various blueberries and huckleberries (Vaccinium spp), various hollies (Ilex spp), winged sumac (Rhus copallina) and sweetleaf (Symplocos tinctoria). Vines include poison ivy (Toxicodendron radicans), Virginia creeper (Parthenocissus quinquefolia), yellow jasmine (Gelsemium sempervirens) and greenbriars (Smilax spp). The ground layer flora of the PPFW is dramatically different from that of the DPFW, with a large number of prairie species occurring only in PPFW. Frequency of herbs and graminoids is directly correlated with disturbance, especially fire. In the presence of fire this diversity can be very high. Common herbs and grasses include little bluestem (Schizachyrium scoparium), broomsedge (Andropogon virginicus), big bluestem (A. gerardii), split-beard bluestem (A. ternarius), spangle-grasses (Chasmanthium laxum and C. sessiliflorum), three-awn grasses (Aristida spp), panic grasses (Dichanthelium acuminatum, D. boscii, D. commutatum, Panicum virgatum, P. anceps, D. rigidulum and others), sunflowers (Helianthus hirsutus, H. angustifolius and others),

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goldenrods (Solidago rugosa, Solidago odora and others), blazingstars (Liatris spicata, L. pycnostachya, L. squarrosa, L. squarrulosa, L. aspera and others), rosinweeds (Silphium integrifolium, S. asteriscus), partridge berry (Mitchella repens), beggarticks (Desmodium glutinosum, D. paniculatum, D. rotundifolium, D. marilandicum, D. viridiflorum and others) and Lespedeza (Lespedeza procumbens). The West Gulf Coastal Plain Saline Glade (BpS 1402) community is embedded within this BpS.

Disturbance Description

Naturally this system was dominated by frequent low to moderate intensity fire with occasional replacement fires associated with grassy fuels and cycles of moisture and drought. Fires would rarely alter species composition or structure. Insect outbreaks (southern pine beetle), ice storm damage and windthrow are also important disturbance factors. Drought and moist cycles play a strong role interacting with both fire frequency and intensity. Native ungulate grazing may have played a small role in maintaining the system.

Adjacency or Identification Concerns

This system often occurs adjacent to and can be influenced by the West Gulf Coastal Plain Pine-Harwood Forest (BpS 1371) and the Gulf and Atlantic Coastal Plain Floodplain Systems (BpS 1473).

Native Uncharacteristic Conditions

Most of this system has been converted to pure loblolly pine plantations less than twenty five years of age.

Scale Description

Greater than 100,000ac.

Issues/Problems

Imported from MZ37 by Brendan Ward on 8/23/07.

Comments

For MZ37, this model was adapted from a Rapid assessment model (R5GCPF) by David Moore and Tom Foti (davemoore@fs.fed.us, tom@arkansasheritage.org).

Vegetation Classes

Class A 10 %

Early Development 1 All Structure

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 2

Indicator Species* and Canopy Position

PITA	Upper
QUPH	Mid-Upper
QUFA	Mid-Upper
QUNI	Mid-Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	100 %
Height	Tree 0m	Tree 5m
Tree Size Class	Sapling >4.5ft; <5"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

0-14yrs. All sites, post-fire grass regrowth, grass seedlings, forbs and hardwood sprouting. Little bluestem, panic grasses, composites, oaks, red maple, black gum. Frequent surface fire (MFRI = five years) or mixed fires (MFRI = 20yrs) maintain this class until it succeeds to C. If 15yrs pass without fire, this class will succeed to B instead of C. Replacement events like fire and wind occur rarely (MFRI = 150yrs and catastrophic weather events = 100yr interval). Saline barrens, glades and prairies would be included in this class.

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Class B 10 %

Mid Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 9

Indicator Species* and Canopy Position

PITA	Upper
QUPH	Mid-Upper
QUFA	Mid-Upper
QUNI	Mid-Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	81 %	100 %
Height	Tree 5.1m	Tree 25m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

15-40yrs. Dense, thick stands of loblolly pine poles intermixed with oaks and other hardwoods. Fuel loads high, with prominent ladder fuels and deep layers of needles on forest floor. Little herbaceous vegetation due to intense shading and thick layers of needles on forest floor. Surface fire at a five-year MFRI. Mixed fire and wind events (MFRI = 50yrs; wind interval = 100yrs) will open the stand and transition B to C. Replacement events like fire and insect outbreaks occur rarely (MFRI = 200yrs and catastrophic insect or disease events = 150yr interval). B will succeed to E.

Class C 20 %

Mid Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 2

Indicator Species* and Canopy Position

PITA	Upper
QUST	Lower
QUFA	Lower
QUNI	Lower

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	31 %	80 %
Height	Tree 5.1m	Tree 25m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

15-40yrs. A two-layered open woodland (canopy and herbaceous) dominated by loblolly pine, with various hardwoods (oaks, red maple and black gum) present as shrubs or sprouts. Diverse ground layer composed of grasses and forbs. Ground layer becomes more diverse with transition to class D as more sunlight reaches the ground layer. Rare replacement fires move class to A (150yr interval). Frequent surface fires (five year interval) maintain the class. With lack of fire for 10yrs, this class moves to B.

Class D 55 %

Late Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 2

Indicator Species* and Canopy Position

PITA	Upper
QUST	Lower
QUFA	Lower
PIEC2	Mid-Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	41 %	80 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Greater than 41yrs. Two-layered open woodland (canopy and herbaceous) dominated by loblolly pine, with various hardwoods (oaks, red maple and black gum) present as shrubs or sprouts. Very diverse ground layer composed of many species of grasses and forbs. Shortleaf pine becomes more abundant than loblolly pine with age of stand due to longer life span and greater fire tolerance. Frequent surface fire (MFRI = five years) and insect outbreaks (300yrs) maintain the openness of this class. If 25yrs pass without fire, this class will succeed to E. Replacement events like fire and wind occur rarely (MFRI = 200yrs each).

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Class E **5 %**

Late Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 9

Indicator Species* and Canopy Position

PITA	Upper
QUST	Mid-Upper
QUFA	Mid-Upper
QUNI	Mid-Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	81 %	100 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

>41yrs. Dense, thick stands of mature loblolly pine intermixed with oaks and other hardwoods. Vines (especially Vitis rotundifolia and Gelsemium sempervirens) prominent. Mid canopy and shrub layer prominent. With prominent ladder fuels and deep layers of needles on forest floor. Little herbaceous vegetation due to intense shading and thick layers of needles on forest floor. Surface fire is at a five year MFRI. Mixed fire (MFRI = 50yrs) will open the stand and transition E to D. Replacement events like fire and insect outbreaks occur rarely (MFRI = 200yrs and catastrophic insect or disease events = 100 year interval) take the class to A. Milder insect or disease events (every 100yrs) move to class D.

Disturbances

Fire Regime Group:** I

Historical Fire Size (acres)

Avg 800
Min 100
Max 5000

Sources of Fire Regime Data

- ☑ Literature
- ☐ Local Data
- ☑ Expert Estimate

Fire Intervals

	Avg FI	*Min FI*	*Max FI*	*Probability*	*Percent of All Fires*
Replacement	175			0.00571	3
Mixed	105			0.00952	4
Surface	5			0.2	93
All Fires	5			0.21524	

Fire Intervals (FI):

Fire interval is expressed in years for each fire severity class and for all types of fir combined (All Fires). Average FI is central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inver 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.

Additional Disturbances Modeled

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

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**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

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**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

LANDFIRE Biophysical Setting Model

***Biophysical Setting* 9814730** **Gulf and Atlantic Coastal Plain Floodplain Systems**

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

General Information

Contributors (also see the Comments field **Date** 11/1/2006

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Modeler 3			**Reviewer**		

Vegetation Type
Wetlands/Riparian

Map Zone
98

Model Zone
☐ Alaska ☐ N-Cent.Rockies
☐ California ☐ Pacific Northwest
☐ Great Basin ☑ South Central
☐ Great Lakes ☐ Southeast
☐ Northeast ☐ S. Appalachians
☐ Northern Plains ☐ Southwest

Dominant Species*

QUTE	QUMI
CELA	CAIL2
QUPH	ULAM
QUNI	FRPE

General Model Sources
☑ Literature
☑ Local Data
☑ Expert Estimate

Geographic Range
MO, AR, TN, MS and LA. The vast majority of this BpS occurs in floodplains and on terraces of large streams within the Mississippi Alluvial Plain from southern IL to the Gulf of Mexico. Smaller units occur along other large streams in the Gulf Coastal Plain and along the Arkansas River in the Interior Highlands.

Biophysical Site Description
This BpS occurs on floodplain terraces of large streams in the Mississippi Alluvial Plain, Gulf Coastal Plain and Arkansas Valley. It excludes the open water, Taxodium distichum--Nyssa aquatica and Quercus lyrata (baldcypress--water tupelo and overcup oak) that occur in deepwater alluvial swamps, sloughs and depressions that are flooded most or all of a given year. Synonyms for this BpS and its subdivisions include alluvial forest and southern bottomland hardwood forest.

Vegetation Description
Apart from treefall gaps, marshes, beaver ponds and non-forested canebrakes, there is a continuous canopy of deciduous broadleaved species. Relative dominance of canopy tree species may vary according to regional location and hydrology. The tree canopy ranges from approximately 80-150ft tall. The understory is less than 80ft tall and is usually composed of the canopy species and deciduous broad-leaved understory species. Understory shrub density is generally low but may be dense on ridges within the bottoms that are less subject to inundation. The herbaceous layer is generally sparse due to shade and/or frequent inundation, although there may be relatively thick herbaceous vegetation in treefall gaps and early seral stages. There are usually more than ten species of canopy trees and over thirty tree and shrub

*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

species total. Canopy tree density is within 15-30 trees per acre and canopy tree basal area is within 100-210 ft2 per acre. Many canopy trees exceed 20in in diameter.

River banks and flat, poorly drained areas within the floodplain are often dominated by Populus deltoides (cottonwood), Betula nigra (river birch), Acer rubrum (red maple), A. saccharinum (silver maple), A. negundo (box elder), Platanus occidentalis (sycamore), Ulmus americana (American elm), Fraxinus pennsylvanica (green ash), F. caroliniana (Carolina ash), Celtis laevigata (sugarberry), C. occidentalis (hackberry), Carya aquatica (water hickory), Diospyros virginiana (persimmon), Magnolia virginiana (sweet bay), Quercus laurifolia (diamond leaf oak) and Q. lyrata (overcup oak). Ridges and levees in low areas and higher areas near the edges of floodplains may be dominated by Liquidambar styraciflua (sweet gum), Q. nigra (water oak), Q. phellos (willow oak), Q. michauxii (swamp chestnut oak), Q. texana (Texas red oak), Q. shumardii (Shumard's red oak), Q. virginiana (live oak), Prunus serotina (black cherry), Ulmus alata (winged elm), Pinus taeda (loblolly pine), Carya illinoensis (pecan), C. glabra (pignut hickory), C. cordiformis (bitternut hickory) and C. ovata (shagbark hickory). Comprehensive species lists for these communities can be found in Heineke (1987).

Disturbance Description

The dominant ecological processes in bottomland hardwood forests are windfall gaps and periodic flooding. Windfall gaps occur on the local (a single mature canopy tree) and the landscape (tornadoes or hurricanes) scale. When canopy trees fall seedlings in the understory are released and compete for a spot in the canopy. This leads to dense areas of herbaceous and woody vegetation in windfall gaps of all sizes. This is a major process in forest regeneration in bottomland hardwood forests. Flooding is more frequent on the lower terraces but frequently floods higher terraces (Wharton zones IV & V; Wharton et al. 1982). Catastrophic floods can cause the loss of canopy over large areas. Canopy decline and reproductive failure can create late seral open stands. Duration of flooding varies with the placement of a site in the landscape and is a dominant process affecting vegetation on a given site. Flooding can deposit alluvium or scour the ground, depending on the landscape position of a site and the severity of the flood event. Fire is infrequent on the lower terraces, but was frequent historically on older terraces outside the floodplain and crept into the floodplains. Wharton et al. (1982) mention that a serious fire season occurs on an average of about every 5-8yrs in the bottomland hardwood forests of the Mississippi Alluvial Plain. It is conjectured that Native Americans maintained canebrakes by deliberate fall burning. Infrequent, mild surface fires would occur in the system; however, they would not alter species composition or structure. Changes in hydrology due to the activities of beaver are also an important ecological process in bottomland hardwood forests. Beaver impoundments kill trees (sometimes over large areas) and may create open water habitat, cypress-tupelo stands, or cause stand replacement. Meandering streams are dynamic and frequently change course, eroding into the floodplain and depositing new point bars, thus creating new habitat for early seral plant communities. Insect outbreaks would occur infrequently in closed canopy states.

Adjacency or Identification Concerns

This BpS grades into the Gulf and Atlantic Coastal Plain Swamp Systems (BpS 1480) which occurs on the lowest, wettest areas of the bottomlands. It also is bordered by a number of upland communities from which fire would have occasionally burned down into the bottoms, especially in drought years. When adjacent to Grand Prairie and loblolly flatwoods the MFRI increases in floodplain system.

Native Uncharacteristic Conditions

Possible changes in community species composition due to alteration of hydrology.

Scale Description

This BpS occurred in patches of millions of acres in the Mississippi Alluvial Plain, with smaller areas in

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the coastal plain and Arkansas Valley.

Issues/Problems

The fire history of this BpS is poorly understood, in part because there has been the widespread assumption that it didn't burn, but the fact that it had extensive cane understory and canebrakes indicates that fire was much more common than is generally believed. These canebrakes exist as a patch community maintained by wind and fire. The effects of beaver ponds on forest dynamics in this system are also poorly understood at the landscape level, especially in the presettlement context. Note that the model assumes that a single pixel represents the area occupied by a single very mature canopy tree. This accounts for the treefall gap ecological process.

Comments

This model was adapted slightly from the Rapid Assessment model R5SOFPif -- Southern Floodplain. The changes were so slight the original modelers were left in the modeler field. Douglas Zollner was added as a reviewer for MZ45 and MZ98.

Vegetation Classes

Class A 20 %

Early Development 1 All Structure

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☐ Tree

Fuel Model 3

Indicator Species* and Canopy Position

QUTE	Lower
QUPH	Lower
LIST2	Lower
FRPE	Lower

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	100 %
Height	Shrub 0m	Shrub >3.1m
Tree Size Class	Sapling >4.5ft; <5"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

0-19yrs. This class includes small scale windfall gaps (the principal method of regeneration in mature bottomland hardwood forests in the absence of larger scale disturbance), large scale catastrophic wind disturbance (tornado & hurricane), water impoundment and inundation caused by channel blockage), and catastrophic stand replacement during major flood events (100yrs). This class includes the fire maintained canebrake community (nonforested type). Average replacement fire is higher in this state because of the canebreak community (MFRI = 30yrs). Infrequent surface fire (MFRI = 100yrs) maintains this class until it succeeds to B.

Class B 30 %

Mid Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 8

Indicator Species* and Canopy Position

QUTE	Upper
QUPH	Upper
CELA	Upper
FRPE	Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	71 %	100 %
Height	Tree 5.1m	Tree 25m
Tree Size Class	Large 21-33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

20-79yrs. This class is a mid seral stage bottomland hardwood forest with a closed canopy. Replacement fire is rare in this state (MFRI = 500yrs). Infrequent surface fire (MFRI = 100yrs) maintains this class until it succeeds to C. Other replacement disturbances include large scale catastrophic wind disturbance (tornado & hurricane) (Interval = 250yrs), water impoundment and inundation (caused by channel blockage),

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*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

catastrophic stand replacement during major flood events (interval = 250yrs) and insect outbreaks (interval = 1000yrs).

Class C 30 %

Late Development 1 Closed

Indicator Species* and Canopy Position

QUTE	Upper
QUPH	Upper
ULAM	Upper
QUPA5	Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	71 %	100 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 8

Description

80yrs+. This class is a mature, late seral closed canopy bottomland hardwood forest. Replacement fire is rare in this state (MFRI = 500yrs). Infrequent surface fire (MFRI = 100yrs) maintains this class. Other rare disturbances have either a replacement (C to A) or thinning effect (C to D) including large scale catastrophic wind disturbance (tornado & hurricane), water impoundment and inundation (caused by channel blockage), catastrophic stand replacement during major flood events and insect outbreaks (interval = 500yrs for both replacement and thinning for each event).

Class D 20 %

Late Development 1 Open

Indicator Species* and Canopy Position

QUTE	Upper
LIST2	Upper
QUPA	Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	21 %	70 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 8

Description

80yrs+. This class occurs through overstory decline in old growth stages, combined with reproductive failure. Replacement fire is rare in this state (MFRI = 500yrs). Infrequent surface fire (MFRI = 100yrs) maintains this class. Other rare disturbances have either a replacement (C to A) or maintenance effect (D to D) including large scale catastrophic wind disturbance (tornado & hurricane), water impoundment and inundation (caused by channel blockage), catastrophic stand replacement during major flood events, and insect outbreaks (interval = 500yrs for both replacement and thinning for each event).

Class E 0 %

[Not Used] [Not Used]

Indicator Species* and Canopy Position

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	%	%
Height		
Tree Size Class		

☐ Upper layer lifeform differs from dominant lifeform.

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model

Description

Disturbances

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**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

Fire Regime Group:** III

Historical Fire Size (acres)

Avg
Min
Max

Sources of Fire Regime Data

- [x] Literature
- [ ] Local Data
- [x] Expert Estimate

Fire Intervals	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
Replacement	110			0.00909	48
Mixed					
Surface	100			0.01	52
All Fires	52			0.01910	

Fire Intervals (FI):

Fire interval is expressed in years for each fire severity class and for all types of fir combined (All Fires). Average FI is central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inver 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.

Additional Disturbances Modeled

- [x] Insects/Disease
- [x] Wind/Weather/Stress
- [ ] Native Grazing
- [ ] Competition
- [x] Other (optional 1) Flooding
- [ ] Other (optional 2)

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*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

LANDFIRE Biophysical Setting Model

Biophysical Setting 9814740 Gulf and Atlantic Coastal Plain Small Stream Riparian Systems

☑ *This BPS is lumped with: 1462*

☐ *This BPS is split into multiple models: BpS 1474 is systematically lumped with 1462. BpS 1462 is too fine for mapping and modeling and may also occur with 1451.*

General Information

Contributors (also see the Comments field **Date** 1/30/2007

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Vegetation Type

Wetlands/Riparian

Map Zone

98

Model Zone

☐ Alaska ☐ N-Cent.Rockies
☐ California ☐ Pacific Northwest
☐ Great Basin ☑ South Central
☐ Great Lakes ☐ Southeast
☐ Northeast ☐ S. Appalachians
☐ Northern Plains ☐ Southwest

Dominant Species*

QUAL FAGR
LIST2 MAGR4
PITA TADI2
QUNI

General Model Sources

☐ Literature
☐ Local Data
☑ Expert Estimate

Geographic Range

The geographic distribution of this BpS includes second and third order forested streams from southeast TX into central LA north into central AR. Species composition and arrangement will likely vary from south to north and east to west.

Biophysical Site Description

The West Gulf Coastal Plain Small Stream Riparian Systems includes both mesic stream bottoms and wet-mesic stream bottoms. Characteristically they form deep, well-developed stream channels and narrow flood plains in the upper reaches. In the lower areas they form broader flood plains. Floods irregularly inundate the lower areas. These sites serve as the transition from the mesic uplands to the seasonally flooded river floodplains. The inclusion of BpS 1462 (West Gulf Coastal Plain Seepage Swamp and Baygall) represents the presence of baygalls embedded within this landscape. Baygalls form at the interface between uplands and streams where soil layers force water to the surface. The wetland characteristics of baygalls limit the growth of overstory trees, resulting in shrubby thickets. Baygalls disappear quickly or gradually into more typical riparian areas with distinct incised stream channels. Beaver dams frequently cause open wetland inclusions of a few to many acres in size, sometimes with considerable open water.

Vegetation Description

White oak (Quercus alba), sweet gum (Liquidambar sytraciflua), loblolly pine (Pinus taeda), water oak (Q. nigra), American beech (Fagus grandifolia) and southern magnolia (Magnolia grandiflora), and in the wettest areas such as long term beaver ponds and small-scale Taxodium distichum (cypress)-Nyssa biflora (swamp black gum) swamps, Cypress (Taxodium distichum) dominate the overstory vegetation of

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this BpS. Numerous other species present vary widely in dominance from place to place, including laurel oak (Q. laurifolia), willow oak (Q. phellos), black willow (Salix nigra), red maple (Acer rubrum), eastern hophornbeam (Ostrya virginiana), American hornbeam (Carpinus caroliniana), American holly (Ilex opaca), and rarely a local subdominant of bigleaf magnolia (M. macrophylla). The fire maintained canebreaks occur infrequently in this BpS under current conditions.

Disturbance Description

Flooding is not severe and frequent enough to play a major role in structural composition in this system. Likewise, fire is probably not a large factor in maintaining these systems. It probably occurred with similar frequency to adjacent uplands on the upper reaches, but was very low intensity and minor. Blowdown and insects impact small areas across the landscape, but only infrequently occur.

Adjacency or Identification Concerns

This BpS occurs between the West Gulf Coastal Plain Mesic Hardwood Forest (BpS 1323) and West Gulf Coastal Plain Pine-Hardwood Forest (BpS 1371) on the upper reaches and the Gulf and Atlantic Coastal Plain Floodplain Systems (BpS 1473) on the lower reaches.

Native Uncharacteristic Conditions

Scale Description

The scale of disturbance is primarily small and gap-phase disturbance occurring from natural tree death, small wind events and fire encroachment from uplands. Widespread events will occur in hurricane prone areas in coastal south-east TX/coastal LA into the Pineywoods. In AR, icestorms could cause a widespread event. Although rare, wildfires can occur in this BpS.

Issues/Problems

In one case, local fire staff described a site on the Kisatchie National Forest as one that would "never burn, or only burn under extreme conditions". Nevertheless, the site burned under low intensity fire used in prescribed burning later that season.

Comments

For MZ37 the description for this model combined some initial modeling by Laing and Mangham (mostly from experiences in east Texas) to Hyatt's experience on the Kisatchie National Forest in Louisiana and his widespread field experience in Arkansas. Douglas Zollner reviewed the model for MZ37.

For MZ45 and MZ98 this model was imported from MZ37 without changes.

Vegetation Classes

Class A **15 %**

Early Development 1 All Structure

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model

Description

Indicator Species* and Canopy Position

PITA	Upper
LIST2	Upper
ACRU	Upper
Carex	Lower

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	0 %	100 %
Height	Tree 0m	Tree 10m
Tree Size Class	Pole 5-9" DBH	

☐ Upper layer lifeform differs from dominant lifeform.

*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

0-15yrs. Surface fires occur infrequently every 40yrs. Mixed and replacement fires are rare (every 250yrs and 300yrs, respectively). Blowdown from storms, insect damage, flooding and other events which create class A leave the area in a variety of conditions. True class A could vary from bare ground created when a flooded beaver pond drains to a tangle of down timber created by blowdown or timber harvest. The structure of class A forms as these open areas begin to regenerate to forest. For the first few years a tangle of wetland and streamside vegetation dominates the area. Carex species, other sedges and wetland forbs such as Rhexia invade forming an initial mat of dense herbs. As trees begin to penetrate this mass, a varied mix of loblolly pine, sweet gum, red maple and other species grow. Species vary widely by soil and hydrology. The fast growing vegetation may be reset to age zero when beavers return and flood small areas (every 200yrs).

Class B **20 %**

Mid Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model

Indicator Species* and Canopy Position

PITA	Upper
LIST2	Upper
ACRU	Upper
	Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	31 %	100 %
Height	Tree 10.1m	Tree 25m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

16-40yrs. Surface fires every 60yrs and mixed fires every 50yrs maintain the class. Rare replacement fires every 300yrs move class to A. Rare flooding and weather events (every 200yrs and 400yrs, respectively) take the class back to A. Species vary so widely in the mid stage of this BpS difficulty exists in describing the overstory. Often loblolly pine has captured the sunlight shading out other species, but other shade tolerant species may dominate, such as red maple. The class is best defined by tree height and diameter. Hydrology varies widely, from somewhat dry lower slopes adjoining streams which are infrequently flooded, to baygalls which are perennially wet, to sites along larger streams with swampy backwater channels, bayous and braided stream form.

Class C **65 %**

Late Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model

Indicator Species* and Canopy Position

PITA	Upper
MAGR4	Upper
FAGR	Upper
TADI2	Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	81 %	100 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Large 21-33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

41yrs+. Surface fires (every 50yrs) and mixed fires (every 200yrs) maintain the class. Replacement fires are rare (every 500yrs) and move class to A. Rare flooding and wind/weather events (every 200 and 300yrs, respectively) take class back to A. Mature stands of this BpS vary widely in species composition. Drier sites may have white oak, loblolly pine, black oak (Quercus velutina), etc. These dry sites occur in the full gradient of streams, from smaller to larger channels in this area. In this setting either soils or topography may contribute to the dryness of the site. For example, a deeply channeled large stream in an area with some slope in the floodplain might both be infrequently flooded and still support white oak as the flooding is brief. As the moisture gradient trends wetter, sweet gum, loblolly pine, and red maple become more dominant. At the wetter end, where backwater sloughs and bayous wind through the floodplain, a more typical wetland overstory forms with loblolly pine, American beech, southern magnolia, and in the wettest areas such as long

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*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

term beaver ponds, cypress. Numerous other species present vary widely in dominance from place to place, including laurel oak, willow oak, black willow, red maple, eastern hophornbeam, American hornbeam, American holly, and rarely a local subdominant of bigleaf magnolia. The fire maintained canebreaks occur infrequently in this BpS under current conditions.

Class D **0 %**

[Not Used] [Not Used]

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☐ Tree

Fuel Model

Indicator Species* and Canopy Position

Structure Data (for upper layer lifeform)

	Min	Max
Cover	%	%
Height		
Tree Size Class		

☐ Upper layer lifeform differs from dominant lifeform.

Description

Class E **0 %**

[Not Used] [Not Used]

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☐ Tree

Fuel Model

Indicator Species* and Canopy Position

Structure Data (for upper layer lifeform)

	Min	Max
Cover	%	%
Height		
Tree Size Class		

☐ Upper layer lifeform differs from dominant lifeform.

Description

Disturbances

Fire Regime Group: I**

Historical Fire Size (acres)

Avg 200
Min 10
Max 5000

Sources of Fire Regime Data

- ☐ Literature
- ☑ Local Data
- ☑ Expert Estimate

Fire Intervals

	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
Replacement	400			0.0025	8
Mixed	130			0.00769	25
Surface	50			0.02	66
All Fires	33			0.03019	

Fire Intervals (FI):
Fire interval is expressed in years for each fire severity class and for all types of fir combined (All Fires). Average FI is central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inver 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.

Additional Disturbances Modeled

- ☐ Insects/Disease
- ☑ Wind/Weather/Stress
- ☐ Native Grazing
- ☐ Competition
- ☑ Other (optional 1) Flooding (beaver ponds)
- ☐ Other (optional 2)

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*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

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*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

LANDFIRE Biophysical Setting Model

***Biophysical Setting* 9814800** **Gulf and Atlantic Coastal Plain Swamp Systems**

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

General Information

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Modeler 3			**Reviewer**		

Vegetation Type
Wetlands/Riparian

Map Zone
98

Model Zone
☐ Alaska ☐ N-Cent.Rockies
☐ California ☐ Pacific Northwest
☐ Great Basin ☑ South Central
☐ Great Lakes ☐ Southeast
☐ Northeast ☐ S. Appalachians
☐ Northern Plains ☐ Southwest

Dominant Species*
TADI2 ACRU
TAAS FRPE
NYAQ2 SANI
QULY

General Model Sources
☑ Literature
☐ Local Data
☑ Expert Estimate

Geographic Range
This BpS occurs from east TX to VA within the Coastal Plain and lower Piedmont and up the Mississippi River basin to southern IL.

Biophysical Site Description
The landscape includes sloughs and abandoned channels which are flooded most or all of a given year as well as backswamps and depressions within the flood plain which are frequently flooded and where soils remain saturated or with water table close to the surface much of the year.

Vegetation Description
The vegetation is generally closed canopy forests ranging from standing water to floodplain depressions. The canopy is normally dominated by cypress (Taxodium spp) and tupelo (Nyssa aquatica) under the wettest conditions and overcup oak (Quercus lyrata) or maple (Acer spp) and ash (Fraxinus spp) on the drier end.

Disturbance Description
Weather, primarily wind and flooding, is the dominant disturbance agent in this type and includes wind damage from hurricanes and tornadoes as well as scouring, changing streamcourses and inundated young stands. Because of its moisture regime, fire is rare, occurring only during extreme drought conditions. In addition, replacement fire requires not only extended drought but accumulated fuel by drift or deep "duff" development (may be normally submerged). Insect outbreaks would occur infrequently in closed canopy states.

Adjacency or Identification Concerns

*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

Native Uncharacteristic Conditions

Scale Description

The landscape has adequate coverage to encompass natural variation. At either end of the spectrum, large swamps may cover millions of acres (Atchafalaya) while individual oxbows may be less than one hundred.

Issues/Problems

Contains long-lived species with very long fire return interval and, often, uncommon conditions required to complete life history.

Comments

For MZs 45 and 98 this model was developed from the Rapid Assessment model R5OFPrf -- Southern Floodplain - Rare Fire by Bruce Davenport and Kevin Robertson and reviewed by Douglas Zollner and Maria Melnechuk. The model description was only slightly modified so no change in modelership was made. Douglas Zollner reviewed the model again for MZ45 and MZ98.

Vegetation Classes

Class A **10 %**

Early Development 1 All Structure

Upper Layer Lifeform

- ☐ Herbaceous
- ☑ Shrub
- ☐ Tree

Fuel Model 8

Indicator Species* and Canopy Position

TADI2	Upper
NYAQ2	Upper
QULY	Upper
FRPE	Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	0 %	100 %
Height	Shrub 0m	Shrub >3.1m
Tree Size Class	Sapling >4.5ft; <5"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

0-19yrs. Seedlings, saplings and some sprouts on drier sites, in openings created by flood scouring, changed streamcourses, wind damage, or, infrequently, fire. Primarily composed of major overstory species with transient herbaceous plants and shrub, small trees and woody vines; the latter, woody group occurring more often on drier sites. Rare weather events and replacement fires occur every 700yrs.

Class B **30 %**

Mid Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 8

Indicator Species* and Canopy Position

TADI2	Upper
NYAQ2	Upper
QULY	Upper
FRPE	Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	71 %	100 %
Height	Tree 5.1m	Tree 25m
Tree Size Class	Large 21-33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

20-99yrs. Dominated by young to early mature canopy species with a few obligate midstory species on less frequently flooded sites. Longer hydroperiod sites at least seasonally flooded and typically display a single, closed canopy layer. Surface fire maintains (every 500yrs). Replacement events include rare insect/disease events, replacement fires (each occuring once a century), and severe weather events (every 500yrs).

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Class C 20 %

Late Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 8

Indicator Species* and Canopy Position

TADI2	Upper
NYAQ2	Upper
QULY	Upper
FRPE	Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	0 %	70 %
Height	Tree 5.1m	Tree 50m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

100yrs+. Early to, more often, late mature open canopy in long-term flooded conditions. Created during wet periods that prevent replacement of mortality. Replacement events include rare insect/disease events, replacement fires (each occuring once a century), and severe weather events (MFRI = 200yrs).

Class D 40 %

Late Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 8

Indicator Species* and Canopy Position

TADI2	Upper
NYAQ2	Upper
QULY	Upper
FRPE	Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	71 %	100 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

100yrs+. Early to late mature closed canopy generally occurring as a single overstory layer, particularly on wetter sites. Drier sites will contain some midstory and young overstory species. Surface fire maintains this class (MFRI = 500yrs). Replacement events include rare insect/disease events and replacement fires (each occuring once a century). Severe weather events can replace this class (approximately every 500yrs) or more commonly will open the canopy and take the class back to C (every 300yrs).

Class E 0 %

[Not Used] [Not Used]

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☐ Tree

Fuel Model

Indicator Species* and Canopy Position

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	%	%
Height		
Tree Size Class		

☐ Upper layer lifeform differs from dominant lifeform.

Description

Disturbances

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Fire Regime Group:** V

Historical Fire Size (acres)

Avg 100
Min 10
Max 1000

Sources of Fire Regime Data

- [ ] Literature
- [ ] Local Data
- [x] Expert Estimate

Fire Intervals	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
Replacement	1000			0.001	41
Mixed					
Surface	700			0.00143	59
All Fires	412			0.00244	

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 inver 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.

Additional Disturbances Modeled

- [x] Insects/Disease
- [x] Wind/Weather/Stress
- [ ] Native Grazing
- [ ] Competition
- [ ] Other (optional 1)
- [ ] Other (optional 2)

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**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

LANDFIRE Biophysical Setting Model

Biophysical Setting 9814900 Gulf and Atlantic Coastal Plain Tidal Marsh Systems

☑ *This BPS is lumped with: 1486*

☐ *This BPS is split into multiple models: BpS 1490 is systematically lumped with 1486. BpS 1486 is too fine for mapping and modeling. In MZ37 1490 is best described by NatureServe's Ecological System CES203.467 (Gulf Coast Chenier Plain Fresh and Oligohaline Tidal Marsh) which is one member of the Gulf and Atlantic Coastal Plain Tidal Marsh Systems*

General Information

Contributors (also see the Comments field **Date** 1/30/2007

Modeler 1	Patrick Walther	patrick_walther@fws.gov	**Reviewer**
Modeler 2			**Reviewer**
Modeler 3			**Reviewer**

Vegetation Type

Wetlands/Riparian

Map Zone

98

Model Zone

☐ Alaska ☐ N-Cent.Rockies
☐ California ☐ Pacific Northwest
☐ Great Basin ☑ South Central
☐ Great Lakes ☐ Southeast
☐ Northeast ☐ S. Appalachians
☐ Northern Plains ☐ Southwest

Dominant Species*

CLADI	SCCA11
SPPA	SPSP
PHAU7	BAHA
ZIMI	SCAM6

General Model Sources

☐ Literature
☐ Local Data
☑ Expert Estimate

Geographic Range

Southwest LA to southeast TX from Vermillion Bay west to Galveston Bay, as far north as the tidal influence. This BpS differs from the marsh found in MZ36 because of their different coastal positions and salt content.

Biophysical Site Description

This BpS occurs on the Chenier Plains of LA and TX. Synonyms of this BpS are coastal marsh and cordgrass marsh.

Vegetation Description

This area was historically dominated by tall grass coastal marshes in fresh to intermediate marsh within the coastal Chenier Plains in micro tidal to tidally influenced wetlands. Dominant grasses ranged from Cladium jamaicense (Sawgrass) and Zizaniopsis miliacea (giant cutgrass) within to the freshest zone to Spartina patens (salt marsh/marsh hay cordgrass) and Schoenoplectus californicus (California Bulrush) in the wet zones with slight tidal influences, marsh hay cordgrass and Phragmites communis (roseau cane/common reed) within seasonal wetlands, and Spartina spartinea (gulfcoast cordgrass) being the dominant species on the prairie and salty prairie ridges with Panicum virgatum (switchgrass) historically present on fresher ridge locations.

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Disturbance Description

The area is subject to frequent wildfire either from lightning or anthropogenic fire on a 2-15yr rotation, with more frequent fire occurrence probably being typical. Tidal flooding events are uncommon unless direct landfall of tropical storms or hurricane passage. These events could create disturbance conditions varying from zones killed by salt water flooding to areas where surface vegetation and root material is torn from the marsh. Drought was also a disturbance factor, with impacts varying from large area die-off after tidal flooding events to occurrences of peat fire that all the creation of large open water areas after removal of all below ground vegetative matter. Frequent flooding during periods of above average rainfall was not uncommon. Herbivory from native ungulate, waterfowl and muskrat were additional disturbance factors that altered the plant community. This herbivory probably followed the occurrence of fire and could lead to further alteration of the vegetative community.

Adjacency or Identification Concerns

This BpS grades into the Gulf of Mexico to the south. The eastern border transitions into the delta marshes with very similar plant communities characterized by soils from the Mississippi River Delta. The northern edges feather into the coastal prairies BpS with an often hard to define transition zone between the two. The western BpS changes around the western edge of Galveston Bay and has a very similar plant community. However, the width of the wetlands is very narrow, and is characterized by firmer sandy soils with less rainfall. The occurrence of fire seems to be much less frequent due to lack of lightning occurrence.

Native Uncharacteristic Conditions

Seasonal wetland marsh sites and salty prairie sites can convert to brushy systems dominated by eastern baccharis (Baccharis halimifolia) and Iva. Wetter sites with S. patens that remain unburned for seven or greater years tend to die back due to suppressed vegetative growth from the amounts of dead stems density.

Scale Description

This BpS occurred across thousands of acres of Chenier Plains in LA and TX.

Issues/Problems

There is very little historical data about this system prior to 1920.

The fire history within this BpS was on a frequent occurrence of 2-5yrs with patches that could go for periods of up to 15yrs without fire. Fire appears to be tied to weather patterns with more frequent fire occurrence during drought or drier seasons. Flooding impacts by tropical storms and hurricanes could vary greatly and are not well understood. Changes in hydrology have greatly altered the plant community across most of this BpS due to salt water influences and increased drainage. Most of the cutgrass and sawgrass marsh has disappeared. Much of the large expanses of California Bulrush marsh have been lost and converted to marsh hay cordgrass.

Comments

NOTE 2/23/08: As a result of final QC for LANDFIRE National by Jennifer Long the upper layer lifeform was changed from “herb” to “shrub” because according to LANDFIRE National rules the height should be designated for the upper-layer lifeform and in the comments section (below) it was noted that this class is a shrub class.

This model was created for MZ37 by Patrick Walther and did not receive review.

For MZ98 this model was adopted from the MZ37 models without changes. No review was obtained for

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MZ98.

During the quality control phase this model was substantially altered by Kori Blankenship from its original form to ensure that the classes were modelable in LANDSUM and mappable using LANDFIRE methods. The original model had three grass classes (A, B, D) and one shrub class (C). The results of the original model indicated class percentages of 15, 55, 25 and 5% in classes A through D respectively and a replacement fire and all fire return interval of 13yrs. The revised model, which is described in the "Vegetation Classes" section of this description, has one grass class and one shrub class. The four classes in the original model are described as follows:

CLASS A
(Herbs; height = 0.6->1.1m; canopy cover = 71-90%; indicator species SPPA, CLADI, PHAU7 and SCAM7)
0 - 1yr. This class grasslands is post disturbance (surface fire) characterized by open semi-canopy in areas with normal fire frequency. Replacement fire within this class is uncommon unless area is impacted by heavy freeze or flooding due to salt water. This class includes all vegetative communities listed as dominant vegetation.

In the VDDT model Native Grazing represents grazing by muskrat and geese (20yr interval). Option 1 represents ungulate grazing with associated soil disturbance through hoof action (four year interval).

CLASS B
(Herbs; height = 1.1->1.1m; canopy cover = 91-100%; indicator species SPPA, CLADI and PHAU7)
2-10yrs. This class grassland is characterized with a closed canopy. Replacement fires are common within this class and maintain this class (11yr interval).

In the VDDT model wind/weather/stress (probability = 0.03, 33 year interval) represents drought and causes a transition to A. Wind/weather/stress (probability = 0.001, 1000yr interval) represents hurricane impact and causes a transition to D. Option 2 represents flooding (30yr interval).

CLASS C
(Shrubs; height = 0.0m - 3.0m; canopy cover = 21-70%; indicator species SPPA, BAHA, PHAU7 and SCCA11)
11yrs+. This class grassland is characterized by closed canopy with any of the following: high ratios of dead to live stem densities, high percentages of brushy vegetation present, increasing cover of brushy species, and possibly open areas where dead grass has collapsed into the water. This class can have intense wild fires with extreme flame lengths. Fires are canopy replacement fires (every 11yrs).

In the VDDT model wind/weather/stress (probability = 0.03, every 33yrs) represents drought and causes a transition to A. Wind/weather/stress (probability = 0.01, every 100yrs) represents hurricane impact and causes a transition to D. The impact of hurricanes on areas in class C is greater than areas in class A and B and represented in the model with a higher probability. Option 2 represents flooding (33yr interval).

CLASS D
(Herbs; height = 0.6m - >1.1 m; canopy cover = 71-90%; indicator species SCCA11 and TYAN)
1-5yrs, then succeeds to B. This class represents grasslands that are produced by surface fires that created peat burns under drought conditions. This class can also be produced by hurricane tidal surges hitting areas with poor vegetative health as the vegetative mat gets removed by scouring effects. The occurrence

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of tropical storm surges can create this class by dumping salt water on a marsh and killing back grass species, which either rot out or get burned off. Vegetation is characterized by low seral stage plant communities. These are rare occurrences but can impact large areas. This class may not be mappable since the grass is completely inundated at some times during this stage.

This class also represents a condition on the landscape in the model which would last about 1-5yrs. It is lumped into this class because mappable criteria could not be developed to distinguish it. This condition is grassland characterized by lower seral stage plant communities. Or this class can either be prone to fire or resistant to fire, depending on the vegetative community present. Heavy herbivory following the fire can change dominant plant community to one of two communities. Continual herbivory can maintain these communities as a lower seral stage plant community.

In the VDDT model wind/weather/stress is used to represent hurricane impact (every 25yrs).

Vegetation Classes

Class A 70 %

Early Development 1 All Structure

Upper Layer Lifeform

- [x] Herbaceous
- [ ] Shrub
- [ ] Tree

Fuel Model 3

Indicator Species* and Canopy Position

SPPA	Upper
CLADI	Upper
PHAU7	Upper
SCAM6	Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	100 %
Height	Herb 0m	Herb >1.1m
Tree Size Class	None	

- [ ] Upper layer lifeform differs from dominant lifeform.

Description

0-10yrs. This is a post-disturbance grassland which results after fire or huricane tidal surges. Replacement fire will be uncommon in the first growing season after a fire but their frequency will increase as the canopy cover and dead material increases. Native grazing by muskrat, geese and ungulates occurs but was not modeled.

In the VDDT model wind/weather/stress (probability = 0.03, 33yr interval) represents the combined probability of drought and hurricanes which reset the age to zero. Option 1 represents flooding (30yr interval) that does not reset the class age. Replacement fire (MFRI = 11yrs) resets the age to zero.

Class B 30 %

Mid Development 1 Open

Upper Layer Lifeform

- [ ] Herbaceous
- [x] Shrub
- [ ] Tree

Fuel Model 3

Indicator Species* and Canopy Position

SPPA	Middle
BAHA	Middle
PHAU7	Upper
SCCA11	Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	21 %	70 %
Height	Shrub 0m	Shrub 3.0m
Tree Size Class	None	

- [x] Upper layer lifeform differs from dominant lifeform.

Grass canopy cover could range from 30-100%.

Description

11yrs+. This class grassland is characterized by closed canopy with any of the following: high ratios of dead to live stem densities, high percentages of brushy vegetation present, increasing cover of brushy species, and possibly open areas where dead grass has collapsed into the water. This class can have intense wild fires with extreme flame lengths. Fires are canopy replacement fires (every 11yrs).

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In the VDDT model wind/weather/stress (probability = 0.03, 33yr interval) represents the combined probability of drought and hurricanes which reset the age to zero. Option 1 represents flooding (30yr interval) that does not cause a transition. Replacement fire (MFRI = 11yrs) causes a transition to class A.

Class C 0 %

[Not Used] [Not Used]

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☐ Tree

Fuel Model

Description

Indicator Species* and Canopy Position

Structure Data (for upper layer lifeform)

	Min	Max
Cover	%	%
Height		
Tree Size Class		

☐ Upper layer lifeform differs from dominant lifeform.

Class D 0 %

[Not Used] [Not Used]

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☐ Tree

Fuel Model

Description

Indicator Species* and Canopy Position

Structure Data (for upper layer lifeform)

	Min	Max
Cover	%	%
Height		
Tree Size Class		

☐ Upper layer lifeform differs from dominant lifeform.

Class E 0 %

[Not Used] [Not Used]

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☐ Tree

Fuel Model

Description

Indicator Species* and Canopy Position

Structure Data (for upper layer lifeform)

	Min	Max
Cover	%	%
Height		
Tree Size Class		

☐ Upper layer lifeform differs from dominant lifeform.

Disturbances

Fire Regime Group:** II

Historical Fire Size (acres)

Avg 500
Min 10
Max 15000

Sources of Fire Regime Data

- ☐ Literature
- ☑ Local Data
- ☑ Expert Estimate

Fire Intervals

	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
Replacement	11			0.09091	100
Mixed					
Surface					
All Fires	11			0.09093	

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 inver 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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**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement seve

Additional Disturbances Modeled

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

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