Rapid Assessment Reference Condition Model

The Rapid Assessment is a component of the LANDFIRE project. Reference condition models for the Rapid Assessment were created through a series of expert workshops and a peer-review process in 2004 and 2005. For more information, please visit www.landfire.gov. Please direct questions to helpdesk@landfire.gov.

Potential Natural Vegetation Group (PNVG)

R9LLSH **Longleaf Pine - Sandhills**

General Information

Contributors *(additional contributors may be listed under "Model Evolution and Comments")*

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Vegetation Type

Woodland

Dominant Species*

PIPA2 QUHE
QULA QUGE
QUIN QUMA
QUMA

General Model Sources

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

LANDFIRE Mapping Zones

46
55
58

Rapid AssessmentModel Zones

- [ ] California
- [ ] Great Basin
- [ ] Great Lakes
- [ ] Northeast
- [ ] Northern Plains
- [ ] N-Cent.Rockies
- [ ] Pacific Northwest
- [ ] South Central
- [x] Southeast
- [ ] S. Appalachians
- [ ] Southwest

Geographic Range

This PNVG occurs from southeastern Virginia to east Texas, and south to central Florida.

Biophysical Site Description

Longleaf pine sandhills occur as dry woodlands/savannas on excessively drained or other xeric soils. Soils are generally deep coarse sands or coarse sands underlain by clay, occasionally with dense surficial clay or sandstone at the surface. It occurs on upland sites ranging from gently rolling, broad ridge tops to steeper side slopes, as well as locally in mesic swales and terraces.

Vegetation Description

The canopy is strongly dominated by longleaf pine (Pinus palustris). Xerophytic scrub oaks, usually turkey oak (Quercus laevis), sometimes mixed with blackjack oak (Quercus marilandica), laurel oak (Quercus hemisphaerica), sand live oak (Quercus geminata), bluejack oak (Quercus incana), or sand post oak (Quercus margaretta), are present as sparsely scattered midstory individuals or clumps and shrub-size fire-sprouts under the reference condition. The oaks become denser with fire exclusion. Other less xerophytic oaks are absent or extremely rare.

The ground cover is dominated by wiregrass (Aristida stricta) over most of the range, but by bluestems (Schizachyrium spp. or Andropogon spp.) in places where Aristida stricta is absent. The herb layer is moderately dense, with a variety of other xerophytic herbs present. Low shrubs are sparse in the reference condition, but can become dense with fire exclusion.

Canopy trees are patchy in distribution, with regeneration in canopy gaps of ¼ acre or less in size, mid-successional clumps in similar sized patches, and the oldest trees occurring as isolated individuals. The reference condition classes are aggregates of numerous patches well dispersed over the landscape. Canopy gaps are created by fire mortality, lightning, and wind throw at the scale of individual trees or several trees. Because of the irregular seed production of longleaf pine, canopy gaps may lack regeneration for several

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years.

Disturbance Description

Longleaf pine sandhills were classified as Fire Regime Group I with frequent surface fires, every 2-5 years, that generally burn across large expanses. Fires are usually low in intensity overall, but will occasionally kill young regeneration patches and rarely kill individual older trees.

Adjacency or Identification Concerns

This PNVG is distinguished from other longleaf pine-dominated groups by the presence of xerophytic oaks and the absence of other oaks, and by the absence of mesophytic or wetland herbs.

Longleaf pine sandhills are abundant in the Sandhills Region of North and South Carolina, and scattered on relict beach ridge systems of the outer coastal plain and on sand dune systems associated with rivers. Rare extreme sandhills (sand barrens) are so excessively drained that all strata are low in density, leaving much bare sand even in the absence of fire. Fuels are too discontinuous to support regular fire. This model does not cover these extreme communities.

Uncharacteristic vegetation types include even-aged canopy stands in which age structure has been homogenized by logging or clearing. Examples include where loblolly or slash pine have replaced some or all of the longleaf pine, where midstory oaks and/or low shrubs have become dense due to inadequate burning, and where the grass-dominated ground cover has been lost due to soil disturbance or past canopy closure.

Scale Description

Sources of Scale Data ☑ Literature ☑ Local Data ☑ Expert Estimate

The landscape is adequate in size to contain the natural variation in vegetation and disturbance regimes. Topographically, areas could be very large and extend continuously over a large expanse of the landscape, or occur as small patches.

Issues/Problems

This model includes areas with Aristida stricta, Aristida beyrichiana and bluestems dominating the understory. This fall line sandhill ecosystem may have two distinct xeric communities in the landscape. Longleaf pine-scrub oak sandhills and longleaf pine-turkey oak sandhills can make up this PNVG within its geographic range. Also, no insect and disease disturbances were noted during the succession pathway of this PNVG. It was suggested that some level of disturbance from a bark beetle infestation be added to this pathway. Most likely Classes B and D would be where the problem would occur. This addition has not been done.

Model Evolution and Comments

The information from FRCC model with PNVG Code LLSH modeled by Mike Schafale on 03 June 2004 was used to load the Reference Condition Model Tracker Database.

Succession Classes**

Succession classes are the equivalent of "Vegetation Fuel Classes" as defined in the Interagency FRCC Guidebook (www.frcc.gov).

Class A 15 %

Early1 All Struct

Description

Class A is characterized by canopy gaps, most single tree to a quarter acre size, with pine regeneration up to 15 years old, or lacking pine regeneration because no mast year has occurred since the gap opened. The native grassy ground cover is dominated by Aristida stricta. Tree cover ranges from 0 to 50%.

Dominant Species* and Canopy Position

PIPA2 All
ARST5 All

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 2

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	100 %
Height	Shrub Medium 1.0-2.9m	Tree Regen <5m
Tree Size Class	Sapling >4.5ft; <5"DBH	

☐ Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

Class B 6 %

Mid1 Closed

Description

Class B includes patches, mostly ¼ acre or less in size, with canopy pines 15-75 years old. A substantial component of mid-story hardwoods or shrubs is encroaching in the absence of fire. The hardwood/shrub cover is greater than 50%. Canopy pine cover ranges between 25-75%.

Dominant Species* and Canopy Position

PIPA2 Upper
QUMA Middle
QULA2 Middle
ARST5 Lower

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 6

Structure Data (for upper layer lifeform)

	Min	Max
Cover	75 %	100 %
Height	Tree Regen <5m	Tree Medium 10-24m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

Class C 35 %

Mid2 Open

Description

Class C includes patches, most ¼ acre or less in size, with canopy pines 15-75 years old. There is a minimal hardwood component and only sparse shrubs due to frequent fire. Aristida stricta dominates the ground cover. Canopy pine cover ranges between 25-75%.

Dominant Species* and Canopy Position

PIPA2 Upper
QUMA Middle
QULA2 Middle
ARST5 Lower

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 6

Structure Data (for upper layer lifeform)

	Min	Max
Cover	25 %	75 %
Height	Tree Regen <5m	Tree Medium 10-24m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

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Class D 40 %

Late1 Open

Description

Class D is characterized by patches, most ¼ acre or less in size, with canopy pines 75 or more years old. There is a minimal hardwood component and only sparse shrubs due to frequent fire. Aristida stricta dominates the ground cover. Canopy pine cover ranges between 25-75%.

Dominant Species* and Canopy Position

PIPA2 Upper
QUMA Middle
QULA2 Middle
ARST5 Lower

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 2

Structure Data (for upper layer lifeform)

	Min	Max
Cover	25 %	75 %
Height	Tree Regen <5m	Tree Medium 10-24m
Tree Size Class	Large 21-33"DBH	

☐ Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

Class E 4 %

Late1 Closed

Description

Class E includes patches with canopy pines 75 or more years old, with a substantial component of hardwoods and/or shrubs in either the overstory or understory. The ground cover is shrubby or sparse. The hardwood/shrub cover is greater than 50%.

Dominant Species* and Canopy Position

PIPA2 Upper
QUMA Middle
QULA2 Middle
ARST5 Lower

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 9

Structure Data (for upper layer lifeform)

	Min	Max
Cover	75 %	100 %
Height	Tree Regen <5m	Tree Tall 25-49m
Tree Size Class	Large 21-33"DBH	

☐ Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

Disturbances

Disturbances Modeled

☑ Fire
☐ Insects/Disease
☑ Wind/Weather/Stress
☐ Native Grazing
☑ Competition
☐ Other:
☐ Other

Historical Fire Size (acres)

Avg: 10000
Min: 1
Max: 100000

Sources of Fire Regime Data

☑ Literature
☑ Local Data
☑ Expert Estimate

Fire Regime Group: 1

I: 0-35 year frequency, low and mixed severity
II: 0-35 year frequency, replacement severity
III: 35-200 year frequency, low and mixed severity
IV: 35-200 year frequency, replacement severity
V: 200+ year frequency, replacement severity

Fire Intervals (FI)

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inverse of fire interval in years and is used in reference condition modeling. Percent of all fires is the percent of all fires in that severity class. All values are estimates and not precise.

	Avg FI	*Min FI*	*Max FI*	*Probability*	*Percent of All Fires*
Replacement	130	25	500	0.00769	3
Mixed	1430			0.0007	0
Surface	4	1	10	0.25	97
All Fires	4			0.25839	

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