

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)

R9OHPI Coastal Plain Pine Oak Hickory

General Information

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

Modelers

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Vegetation Type

Forested

General Model Sources

- Literature
- Local Data
- Expert Estimate

Rapid Assessment Model Zones

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

Dominant Species*

PIEC2	PITA
QUAL	QUST
CAAL	
QUFA	

LANDFIRE Mapping Zones

55	54
58	59
46	44

Geographic Range

Within the southeast zone this PNVG is found on dissected landscapes within the upper coastal Plain. It is scattered through the piedmont of Georgia, South Carolina, North Carolina, and Virginia, but is most prevalent west and north through Alabama and Mississippi. This type is found most extensively in the Piedmont, Appalachian, and Quachita regions of the adjoining zones.

Biophysical Site Description

This PNVG occurs on slopes and dryer rolling uplands of the upper coastal plain that are not fire sheltered. Soils are acidic and well drained, but not deep sands. Elevations generally range from 200 to 500 ft amsl.

Vegetation Description

Shortleaf pine (*Pinus echinata*) dominates dryer south and west facing slopes often with white oak (*Quercus alba*), post oaks (*Q. margaretta*, *Q. stellata*) and mockernut hickory (*Carya tomentosa*). The understory was open savanna-like, and dominated by grasses and forbs. Loblolly pine (*Pinus taeda*) was restricted to the southern edge where the type graded into longleaf pine (*P. palustris*) dominated vegetation. Red oak (*Quercus falcata*) and black oaks (*Q. velutina*) were more frequent on moister areas like north slopes and sites that burned at a lower intensity due to partial protection from natural landscape features.

Disturbance Description

Frequent surface fires occurred on a 4 to 8 year return interval from both lightning and native American ignitions. These frequent light surface fires maintained the grassy understory and kept more fire tolerant hardwoods and shrubs from capturing the understory and forming a midstory layer. Lightning fires occurred primarily during the spring dry season (April and May) with a second peak of native American burning during the fall (October and November).

Occasionally, during extensive droughts, mixed severity or stand replacement fires did occur, especially on dryer pine dominated sites. Local thunder storms created gaps on a small but continual basis. More

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extensive regional disturbances included tropical storms during the growing season and ice storms during winter. Dense stands of middle to older aged pines were susceptible to periodic mortality from bark beetle epidemics.

Adjacency or Identification Concerns

On the southern extent this PNVG grades into R9LLBS. Many of the currently existing stands have much more loblolly pine than existed prior to European settlement. These stands are also much denser with more midstory hardwoods, including mesic hardwoods like red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), and water oak (*Quercus nigra*), and an understory dominated by woody shrubs and tree seedlings resulting from reduced frequency of surface fires.

Scale Description

Sources of Scale Data Literature Local Data Expert Estimate

Surface fire usually covered the entire fire compartment, which ranged in size from 10 to 500 acres. The actual fires however, were much larger. They usually started in the adjacent longleaf ecosystem and then entered into this vegetation type. Within this vegetation there was considerable patchiness in overstory species composition. Uniform composition varied in size from 1/4 to 5 acres. This was related to topography and disturbance. In openings created by windthrow and disease where a single tree or two were lost, regeneration occurred. Larger gaps were created by tropical storms, ice storms, or bark beetle outbreaks. These disturbances still resulted in mostly small gap openings of 1/4 to 2 acres. Large opening were infrequently created by replacement fires following extensive droughts coupled with severe bark beetle mortality.

Issues/Problems

The former extent of this type is somewhat conjecture based on limited data from a few sites across the region. Historic fire return intervals however, are much more certain.

Model Evolution and Comments

This model replaces R8PIECpi from the Southern Appalachian model zone.

Based on model from FRCC (POHS) developed by C. Frost, whom needs to review the information contained in this database. In Alabama and Mississippi this equates to CES203.506 of NatureServe classification.

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

Class A 10%

Early1 All Struct

Description

Class A is characterized by pine and oak reproduction in gaps up to sapling size. It can be nearly pure shortleaf pine on dryer sites, in larger gaps resulting from beetle kills, and/or after mixed or replacement fires.

Class A transitions into Class C after 15 years with surface fire occurring every 7 years. Replacement fires occur in this class on average once every 100

Dominant Species* and Canopy Position

PIEC2 Upper
QUAL Upper

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Fuel Model 2

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	100 %
Height	no data	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:

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years, which maintains the vegetation in the early post-replacement phase. In the absence of fire for 15 years or more, Class A will transition into Class B through an alternative successional pathway.

Class B 25 %

Mid1 Closed

Description

Class B has a closed canopy dominated by hardwoods and/or pine, with a midstory of hardwoods resulting from fire exclusion. Understory herbaceous growth is reduced due to substantial shading of the over and midstory layers. Trees in Class B generally range from 15 to 60 years of age.

In the absence of fire or other disturbances Class B will succeed to Class E after the canopy exceeds 60 years old. Rare replacement fires, occurring once every 200 years will return Class B to the early post-replacement stage. Surface fires may occur in Class B every 20 years, but these are not intense or frequent enough to kill the overstory or thin the midstory. More intense mixed fires, occurring once every 20 years, can reduce the overstory and midstory, and drive the system to a more open condition characteristic of Class C.

Dominant Species* and Canopy Position

PIEC2 Upper
 QUAL All
 CAAL2 Low-Mid
 COFL2 Lower

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Fuel Model 8

Structure Data (for upper layer lifeform)

	Min	Max
Cover	75 %	100 %
Height	Tree Short 5-9m	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 C 35%

Mid1 Open
Description

Class C is an open woodland of pine and oak with a grass and forb dominated understory. The overstory trees in Class C generally range from 15 to 60 years of age.

With surface fire occurring every 6 years on average, Class C will retain an open structure and succeed into Class D after the canopy reaches 60 years old. In the absence of fire for more than 12 years, a midstory will develop and Class C will transition into Class B. Rare replacement fires may occur every 200 years and return Class C to the early post-replacement condition. Severe wind or weather stresses, occurring once every 250 years, can also return Class C to the early post-replacement phase.

Dominant Species* and Canopy Position

PIEC2 Upper
QUAL Upper

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Fuel Model 2

Structure Data (for upper layer lifeform)

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

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

Class D 20%

Late1 Open
Description

Class D is an open woodland with large pines and oaks and a herbaceous dominated understory. The overstory is generally greater than 60 years old.

With surface fires occurring on average once every 6 years, Class D will retain the open, old growth structure. If fire is removed from the system for more than 15 years, Class D will develop a midstory and transition into Class E through an alternative successional pathway. Rare replacement fires may occur once every 300 years during extremely dry conditions and return Class D back to the early post-replacement phase. Insect and disease outbreaks,

Dominant Species* and Canopy Position

PIEC2 Upper
QUAL Upper
All

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Fuel Model 2

Structure Data (for upper layer lifeform)

	<i>Min</i>	<i>Max</i>
<i>Cover</i>	25 %	75 %
<i>Height</i>	Tree Medium 10-24m	Tree Tall 25-49m
<i>Tree Size Class</i>	Large 21-33"DBH	

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

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occurring once every 300 years, and wind/weather stresses, occurring once every 200 years, can also return Class D to the early post-replacement phase.

Class E 10 %

Late I Closed

Description

Class E is a closed canopy forest with large pines and oaks, a midstory of hardwoods, and a sparse understory dominated by shrubs and tree seedlings. The canopy in Class E is generally greater than 60 years old.

Class E occurs when fire is absent from the system, or when light surface fires occur at a frequency of once every 20 years or less. Mixed fires occurring in Class E will remove the midstory and some of the overstory, and return the system to a more open condition characteristic of Class D. Mixed fires are infrequent, and occur only once every 100 years. Rare replacement fires may occur once every 200 years during extreme drought events, and return the system to the early post-replacement phase. Insect and disease outbreaks, occurring once every 200 years, and wind/weather stresses, occurring once every 250 years, can also return Class E to the early post-replacement stage. Less intense, but more frequent wind/weather stresses, occurring once every 100 years, can reduce the midstory and overstory, and return Class E to the open Class D.

Dominant Species* and Canopy Position

PIEC2 Upper
 QUAL Upper
 CAAL2 Low-Mid
 COFL2 Low-Mid

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Fuel Model 8

Structure Data (for upper layer lifeform)

	<i>Min</i>	<i>Max</i>
<i>Cover</i>	75 %	100 %
<i>Height</i>	Tree Medium 10-24m	Tree Tall 25-49m
<i>Tree Size Class</i>	Large 21-33"DBH	

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

Disturbances

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Disturbances Modeled

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

Historical Fire Size (acres)

Avg: 2000
 Min: 100
 Max: 10000

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.

	<i>Avg FI</i>	<i>Min FI</i>	<i>Max FI</i>	<i>Probability</i>	<i>Percent of All Fires</i>
<i>Replacement</i>	200			0.005	4
<i>Mixed</i>	100			0.01	7
<i>Surface</i>	8			0.125	89
<i>All Fires</i>	7			0.14	

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