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)

R9MEFL   Mesic-Dry Flatwoods

General Information

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

Modelers		**Reviewers**	
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Vegetation Type

Forested

Dominant Species*

PIPA2   ILGL
PIEL
SERE2
ARBE

General Model Sources

☐ Literature
☐ Local Data
☑ Expert Estimate

LANDFIRE Mapping Zones

55   58
56
46

Rapid AssessmentModel Zones

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

Geographic Range

Mesic-dry flatwoods occurs from central Florida north to the outer coastal plain of Georgia and South Carolina, and west through the Florida Panhandle perhaps to the Mississippi River.

Biophysical Site Description

This PNVG occurs in seasonally wet to flooded woodlands on nearly level, somewhat poorly to poorly drained sandy soils with dark sandy layers (mostly spodosols) and generally low pH (3-5). It also experiences seasonal droughts during dry periods.

Vegetation Description

Mesic-dry flatwoods is characterized by an open, savanna-like to nearly closed canopy of longleaf pine (Pinus palustris), with a component of slash pine (Pinus elliottii). In areas, such as south-central Florida, the canopy may be mostly slash pine. Occasional pond pine (Pinus serotina) may be present. The understory consists of mostly saw palmetto (Serenoa repens), and evergreen shrubs and trees including: lyonia (Lyonia lucida, L. fruiticosa, L. ferruginea, L. ligustrina), blueberries (Vaccinium corymbosum, V. darrowii, V. myrsinites, V. stamenium), titi (Cliftonia monophylla), oaks (Quercus spp.), wax myrtle (Myrica cerifera), hollies (Ilex spp.), gallberry (Ilex glabra) and bays (Persea spp.). These are typically of low stature under natural fire regimes. Ground cover species include wiregrasses (Aristida spp.), toothache grass (Ctenium aromaticum), dropseeds (Sporobolus spp.), panic grasses (Panicum spp.), and various perennial herbs.

Canopy trees are patchy in distribution, with regeneration in canopy gaps of ¼ acre or less in size. Mid-successional clumps occur in similar sized patches as regeneration. The oldest trees occur 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 to several trees.

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

Disturbance Description

Frequent surface fires, often occurring every 1-3 years but ranging up to 5 year intervals, generally burn most of the vegetation. The mean fire return interval is skewed towards the more frequent end of this range. Fires are usually moderate in intensity overall, generally resulting in topkill of the lower and middle layers, but periodically will kill young regeneration patches and occasionally individual older trees. Although fire can occur in any season, in pre-European settlement times many lightning fires probably occurred during the dry summer season, although Native Americans were common in these areas and represented a significant ignition source. In this landscape, frequency is more important than seasonality, as long as the season of burn is varied periodically. This community is subjected to hurricanes which may cause thinning of stands, localized blowdown or uprooting of stands, or perhaps rarely blowdowns or larger areas. Flooding may cause vegetation changes at ecotones with wetland types.

Adjacency or Identification Concerns

Mesic-dry flatwoods exists as matrix in which many other types occur, often due to slight elevation changes, fire shadows, or strips parallel to extended elevation gradients between uplands and wetlands. In dry locations, it may be considered scrubby flatwoods. The wetter end may grade into wet flatwoods or savannas. Mesic-dry flatwoods may grade into dry or wet prairie as the tree canopy thins.

Scale Description

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

Low intensity fires may have ranged in size from very small to thousands of acres pre-fragmentation. Replacement fires may have been localized to less than an acre, or as large as hundreds of acres. Hurricane and wind damage may have ranged from single trees, to a few tens of acres scattered in the landscape. Flooding disturbance probably was limited to a few acres. Patch size of this type may range from 10 acres to thousands of acres, forming the matrix within which other types are imbedded, especially in Florida

Issues/Problems

This community has very few reference examples from which to test the model outputs. The relative patchiness and presence of a high percentage of seral class C, represents a hypothesis for how fire and other disturbances maintained this community. The distribution of seral stages in this model should be managed with wide confidence intervals, recognizing the variation of structure in this community on the model landscape and the few glimpses of it in its pre-Columbian condition.

Uncharacteristic vegetation types include even-aged canopy stands in which age structure has been homogenized by logging or clearing, often coupled with drainage. Examples include where loblolly or additional slash pine have replaced some or all of the longleaf pine. The effects of bedding, even when establishment of planted pine plantation has failed, persist often for many decades. Bedding may not completely drain a site; however, the alteration of micro-topography may affect the spread of fire. Disturbance caused by insects and other pathogens are very rare, except where conversions to dense stands of loblolly have occurred. I really think percents in this and the other longleaf dominated models should look more like the mesic uplands model.

Model Evolution and Comments

Wayne Taylor, Keith Fisher, Sharon Hermann

Succession Classes**

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

Class A   20 %

Early1 All Struct

Description

Class A is a post replacement stage with canopy gaps, mostly single tree to quarter acre in size, of pine regeneration up to 15 years old. The native ground cover is dominated by wiregrass and other grasses, small statured shrubs, and forbs.

Dominant Species* and Canopy Position

PIPA2   Upper
PIEL   Upper
ARBE7   Lower

Upper Layer Lifeform
☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 2

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	50 %
Height	Tree Regen <5m	Tree Short 5-9m
Tree Size Class	Sapling >4.5ft; <5"DBH	

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

Class B   4 %

Mid1 Closed

Description

Class B is characterized as a mid-seral closed stage with patches, mostly quarter acre or less in size, of canopy pines 15-75 years old and a substantial component of hardwoods (e.g., oaks, titi, bays) or other pine species encroaching in the absence of fire. The hardwood and encroaching pine cover is greater than 50%. The canopy pine cover ranges from 50-75%.

Dominant Species* and Canopy Position

PIPA2   Upper
PIEL   Upper
QUERC   Upper

Upper Layer Lifeform
☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 7

Structure Data (for upper layer lifeform)

	Min	Max
Cover	25 %	75 %
Height	Tree Regen <5m	Tree Short 5-9m
Tree Size Class	Pole 5-9" DBH	

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

Class C   44 %

Mid1 Open

Description

Class C is characterized by a mid-seral open condition with patches, most ¼ acre or less in size, of canopy pines 15-75 years old and a minimal hardwood component due to frequent fire. The ground cover is grass-dominated, generally by wiregrass. The canopy pine cover ranges from 50-75%.

Dominant Species* and Canopy Position

PIPA2   Upper
PIEL   Upper
SERE2   Low-Mid
ARBE7   Lower

Upper Layer Lifeform
☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 2

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	25 %
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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*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.

Class D   29 %

Late1 Open
Description

Class D is classified as a late-seral open stage with patches, most ¼ acre or less in size, of canopy pines 75 or more years old and a minimal component of hardwoods. The ground cover is grass-dominated, generally by wiregrass. The canopy pine cover ranges from 25-75%.

Dominant Species* and Canopy Position

PIPA2	Upper
PIEL	Upper
SERE2	Low-Mid
ARBE7	Lower

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 2

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	25 %
Height	Tree Medium 10-24m	Tree Tall 25-49m
Tree Size Class	Medium 9-21"DBH	

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

Class E   3 %

Late1 Closed
Description

Class E is characterized by a late-seral closed stage with patches of canopy pines 75 or more years 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. The hardwood and encroaching pine cover is greater than 50%.

Dominant Species* and Canopy Position

QUERC	Upper
PIPA2	Upper

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 4

Structure Data (for upper layer lifeform)

	Min	Max
Cover	25 %	100 %
Height	Tree Medium 10-24m	Tree Tall 25-49m
Tree Size Class	Medium 9-21"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: 1000
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	65	5	150	0.01538	3
Mixed	550			0.00182	0
Surface	2	1	8	0.5	97
All Fires	2			0.51720	

References

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