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)

R9SOFP **Southern Floodplain**

General Information

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

Modelers

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Reviewers

Vegetation Type

Forested

Dominant Species*

TADI2	ACRU
TAAS	FRPE
NYAQ	SANI
QULY	NYSY

General Model Sources

- ☑ Literature
- ☐ Local Data
- ☑ Expert Estimate

LANDFIRE Mapping Zones

45	58	60
46	55	48
54	59	

Rapid AssessmentModel Zones

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

Geographic Range

Southern flood plain occurs from southeast Louisiana to the Hudson River in New York and New Jersey within the Coastal Plain and Piedmont. It excludes the Mississippi River alluvial basin and delta upstream to southern Illinois where the R5SOFPrf and R5SOFPif models are a better fit. This PNVG is typified by floodplain forests along the Pascagoula River, Mobile River, Savannah River, and many others within the southeast coastal plain.

Biophysical Site Description

This PNVG includes sloughs and abandoned channels which are flooded most or all of a given year as well as back swamps and depressions within the flood plain which are frequently flooded, and where soils remain saturated or with the water table close to the surface much of the year.

Vegetation Description

Southern flood plains are generally closed- canopied forests that range from standing water to floodplain depressions. They are normally dominated by cypress (Taxodium distichum, T. ascendens) 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. This includes wind damage from hurricanes and tornadoes as well as scouring, changing stream courses, and inundation of 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).

Adjacency or Identification Concerns

Included in the southern floodplain forest are both the Kuchler type 113 and coarse scale PNVG 61 types.

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

There are differences in the hydroperiod from other, adjacent types, that often results in a dependence on drought for regeneration and, subsequently, stand structure. In the absence of characteristic vegetation, the break in the moisture gradient between the drier end of this type and even drier types may be unclear. This PNVG contains increasingly common inclusions of piedmont flood plain forest (PFPF) where the upper coastal plain meets the piedmont.

Scale Description

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

Adequate coverage to encompass the natural range of variability is 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

This PNVG contains long-lived species with a very long fire return interval and, often uncommon conditions are required to complete their life history. Literature and documentation of modeled conditions, especially fire, are not readily available, particularly during the compressed schedule of an RA workshop.

Moving farther north of the geographic area defined for this model into the glaciated regions with significant winter snow and ice accumulations does substantially change the non-fire disturbance dynamics within river channels and basins. Heavy spring time precipitation events at the end of cold winters with deep snow and ice accumulations are fairly common, with increasing frequencies with increasing latitude and distance from the maritime influence. These spring time peak runoff events frequently cause extreme channel scouring and backwater flooding due to ice jams and ice flows that are not reflected in this model.

Modeling did not expressly embrace blackwater river floodplain variants, however, the model may or may not be applicable to blackwater riverine systems with small modifications.

Model Evolution and Comments

Suggested reviewers are Tom Foti (tom@arkansasheritage.org), Paul Hamel (phamel@fs.fed.us), Charles Klimas (Waterways Exp. Sta.), and Rob Evans (? Formerly NatureServe).

This model combines and modifies the 4-box R5SOFPrf initial draft for the Rapid Assessment (RA) with the initial draft the of 3-box SOFP for the SE FRCC Guidebook by K. Robertson. The disturbances and higher probabilities from the SOFP 3-box version were substituted for their counterpart Classes in the 4-box RA version for the SE Map Zone RA effort. The 4th box allows for relatively rare wind+catastrophic flooding events that periodically partially to completely reshape vegetative communities and/or their substrates. This modification from the South Central Zone approach is based on: narrower river basins in the Southeast Map Zone than in the South Central Zone resulting in more frequent and intense but shorter duration wind+flooding events along with greater exposure to fire spread during drought periods from adjacent, more fire-prone upland PNVG's. This assumption needs further investigation, presumably a cross-section of river gauge data from throughout the Southeast Model Zone exclusive of Map Zone 56.

The original RA model identified FBPS FM 9, but was changed to FM 8 in this version based on an assumption that the frequent flooding regime tends to compact the litter layer, leading to greater resistance to fire spread than typifies FM 9. In addition, the modelers corrected descriptions for Classes C/D (late open/late closed) which were reversed in the South Central Zone RA VDDT model, but from which descriptions for classes C/D were based.

Surface Fire was added to Class A (prob = 0.03) and the Surface Fire frequency was increased in all other Classes (B-D prob = 0.0.015), compared to that used in original SOFP FRCC model.

Replacement fire was added to Class C with a 0.001 probability (Late-Open) for consistency with Classes B-D. The Replacement Fire frequency for Class A was increased to 1/500 years (prob = 0.002), given greater herbaceous fuel loading and sunlight exposure of fuel beds expected in Class A which carries fire slightly

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better than a fuel bed under a closed forest canopy. The original SOFP FRCC model indicated a replacement fire frequency of 1/1000 years (prob = 0.001), as taken from the South Central RA versions.

A 1/1000 year frequency (prob = 0.001) of replacement level Wind/Weather/Stress (yields Class A) was used to describe a more resilient and shorter Class A, and a frequency of 1/500 years (prob= 0.002) was used for Classes C-D. A probability of 1/250 years (prob. = 0.004) was used to describe mature stand opening Wind/Weather/Stress (yields Class C) for the Class D to Class C pathway.

The 5-class Piedmont Flood Plain Forest (PFPF) was examined as well. This PFPF model yielded a somewhat lower fire frequency, with the difference attributable to the low intensity surface fire frequency (65 vs. 33 years). There was virtually no difference in the very rare replacement fire frequency. The 10% or less of the landscape in open classes (primarily canebrake) under the PFPF model is assumed to be included in the 35% of the open (Class C) yielded by this model. The PFPF FRCC Guidebook draft model seems most appropriate at the fine scale, FRCC Guidebook LANDFIRE level for landscapes located in the Piedmont and upper coastal plain, but appears to occupy too small a proportion of the Southeast Map Zone to warrant breaking out as a separate Rapid Assessment map unit.

Succession Classes**

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

Class A 5 %

Early1 All Struct

Description

Class A, 0-19 years post replacement, includes seedlings, saplings, and some sprouts on drier sites, in openings created by flood scouring, changed stream courses, wind damage, or infrequently, fire. The regeneration is 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.

Dominant Species* and Canopy Position

TADI2 Upper
NYAQ2 Upper
QULY Upper
FRPE Upper

Upper Layer Lifeform

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

Fuel Model 8

Structure Data (for upper layer lifeform)

	Min	Max
Cover	40 %	80 %
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 15 %

Mid1 Closed

Description

Class B, 20-79 years post replacement, is dominated by young to early mature canopy species with a few obligate midstory species on less frequently flooded sites. Longer hydroperiod sites are at least seasonally flooded, and typically display a single, closed canopy layer.

Dominant Species* and Canopy Position

TADI2 Upper
NYAQ2 Upper
QULY Upper
FRPE Upper

Upper Layer Lifeform

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

Fuel Model 8

Structure Data (for upper layer lifeform)

	Min	Max
Cover	70 %	100 %
Height	Tree Short 5-9m	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:

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

Class C 15 %

Late1 Open

Description

Class C, 80+ years post replacement, contains an early to, more often late mature open canopy in long-term flooded conditions. It is created by non-replacement peak flow, channel scouring events or prolonged wet periods that prevent replacement of mortality. Canopies opened by such events will reclose (move back to Class D) in the absence of fire or long intervals between peak flow or unusually long wet period events.

Dominant Species* and Canopy Position

TADI2 Upper
NYAQ2 Upper
QULY Upper
FRPE Upper

Upper Layer Lifeform

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

Fuel Model 8

Structure Data (for upper layer lifeform)

	Min	Max
Cover	60 %	70 %
Height	Tree Medium 10-24m	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:

Class D 65 %

Late1 Closed

Description

Class D, 80+ years post replacement, is characterized by an 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.

Dominant Species* and Canopy Position

TADI2 Upper
NYAQ2 Upper
QULY Upper
FRPE Upper

Upper Layer Lifeform

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

Fuel Model 8

Structure Data (for upper layer lifeform)

	Min	Max
Cover	70 %	100 %
Height	Tree Medium 10-24m	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:

Class E 0 %

Late1 All Structu

Description

Dominant Species* and Canopy Position

Upper Layer Lifeform

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

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	%	%
Height	no data	no data
Tree Size Class	no data	

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

Disturbances

Disturbances Modeled

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

Historical Fire Size (acres)

Avg: 100
Min: 10
Max: 1000

Sources of Fire Regime Data

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

Fire Regime Group: 3

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	900			0.00111	7
Mixed					
Surface	63			0.01587	93
All Fires	59			0.01699	

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