

## 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](http://www.landfire.gov). Please direct questions to [helpdesk@landfire.gov](mailto:helpdesk@landfire.gov).*

### Potential Natural Vegetation Group (PNVG)

**R7OAPIdx Eastern Dry-Xeric Oak Pine**

#### General Information

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

**Modelers**

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**Vegetation Type**

Woodland

**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\***

QUPR	PIEC2
QUCO	QUMU
PIVI2	QUVE
PIPU5	PIRI

**LANDFIRE Mapping Zones**

61	59	62
63	57	60
65	53	64

**Geographic Range**

This type is distributed on ridges throughout the Appalachian highlands: Cumberlands, Southern Blue Ridge, Central and Southern Appalachians, upper Piedmont, and Ridge and Valley. Scattered occurrences occur in the High Alleghanies and Lower New England.

**Biophysical Site Description**

These woodlands typically are found on dry to xeric sites, such as ridgetops and adjacent convex upper slopes. Rapid drainage and high exposure create a xeric edaphic setting. In most place, they are on acidic bedrock. Elevation is between 1000 and 3500 feet in the southern half of the range, and at lower elevations northward. Aspect is variable: western, southern, southwestern, southeastern, and, on lower elevations in the southern Appalachians, dryer northern aspects.

**Vegetation Description**

Overstory oaks dominate with up to 60% oak specific. Tree species include scarlet oak, chestnut oak, black oak, post oak, chinkapin oak, shumard oak, and hickory with mixes of Virginia pine, eastern white pine, shortleaf pine, pitch and/or tablemountain pine. Midstory species in natural systems are primarily oak, but can include blackgum, red maple, American beech, dogwood, hickories, ashes, elms, eastern white pine, sourwood, black locust, black cherry, sassafras, mountain laurel, eastern red cedar, along with sprouts of American chestnut. The shrub layer is typically characterized by ericads such as blueberries (*Vaccinium* spp.), fetterbush (*Pieris floribunda*), mountain-laurel (*Kalmia latifolia*), and huckleberries (*Gaylussacia* spp). Ground cover typically also include sedges (*Carex* spp.) and a variety of herbaceous plants.

More mesic inclusions may have serviceberry, basswood, eastern hemlock, or American holly in the tree layers and silverbell, rhododendron, hobblebush (*Viburnum alnifolium*), dogwood, sawbrier (*Smilax glauca*), greenbrier (*S. rotundifolia*), wild grape (*Vitis* spp.), and others in the shrub layer.

Without periodic fire, advanced oak regeneration is usually absent except on xeric sites. With even shorter fire return intervals (or more intense growing-season burns) successional shifts of oak forest and woodlands

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

to savannas or to woodlands with more of a pine component are possible.

### Disturbance Description

Fire regime group I, with frequent surface fires.

Pre-settlement fire return intervals are believed to have ranged from 3-14 years. Natural fire regimes were primarily surface fires during the dormant season with occasional growing season mosaic fires (most likely occurring infrequently once or twice every 20-25 years).

Windthrow and ice damage can be important agents in opening the canopy, particularly in the more northern portions of the range.

### Adjacency or Identification Concerns

This represents a more xeric and exposed type related to the widespread Appalachian - Oak type (R7APOK), and they grade into each other both conceptually and geographically. In the southern half of the range, particularly where fires are more intense, this type grades into the Table Mountain Pine type (or should that be considered a part of this type?).

In the absence of fire, mesophytic species (e.g. eastern white pine, yellow poplar, maples and others) are likely to replace oaks. Widespread oak decline and stand-replacement with species like mountain-laurel can dramatically change dominance regimes. Nonnative invasive plant species (most notable Asiatic bittersweet and kudzu) along with insects (most notably gypsy moth) can also exacerbate community shifts.

### Scale Description

Sources of Scale Data  Literature  Local Data  Expert Estimate

This is a large-patch type, generally occupying distinct physiographic settings (ridges, upper slopes) on the order of 100s of hectares, rather than extending over large continuous areas.

### Issues/Problems

FRCC type originally described for Cumberlands and Southern Appalachians, but the concept extends further north on the most exposed mid-elevation ridges.

### Model Evolution and Comments

I included Roger Fryar's name as a modeler even though he was not at the northeast meeting, since the material here started as his FRCC description (OKHK1). This type may extend slightly into the eastern lobe of the Midwest model zone. Possibly occurs in model zone 48? Note that age ranges for classes are from the original Fryar model as further information unavailable while modifying model 2/16/05. Also note that class dominants were honestly guesses as detailed class information or plot data not available during the workshop. These need review, preferably across the latitudinal range of this type. Suggested reviewers: Pat Brose (pbrose@fs.fed.us, USFS Research NE Station, PA); Mark Abrahms (agl@psu.edu, Penn State Univ); Tom Schuler (tschuler@fs.fed.us, Fernow Experimental Forest, WVA, USFS); Cecil Frost.

Peer reviewed by Michael S. Batcher, Ecologist, 4/22/05 and Daniel Yaussy, Supervisory Research Forester USDA Forest Service, 03/31/05.

## Succession Classes\*\*

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

### **Class A**      5%

**Early1 Open**

**Description**

Pine and oak reproduction to 15' tall and about 15 years old. Community of forbs and perennial grasses. More persistent on dry sites. Openings tend to be small and have scattered live trees. < 25% tree canopy cover.

**Dominant Species\* and Canopy Position**

QUPR2 Upper  
PIVI2 Upper  
CAPE6 Lower  
DASP2 Lower

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Structure Data (for upper layer lifeform)**

	Min	Max
Cover	0 %	25 %
Height	Shrub Short 0.5-0.9m	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:

Dominant lifeform is graminoids and forbs. Scattered live trees and tree regeneration.

**Fuel Model** 2

### **Class B**      5%

**Mid1 Closed**

**Description**

Mid-development (15-60 years) with closed canopy, oak with shortleaf, pitch, Virginia pine or occasionally eastern white pine with little or no herbaceous understory. Some woody understory development. > 50% canopy cover (crown closure estimate). In the continued absence of fire, mesophytic species (e.g. eastern white pine, yellow poplar, maples and others) are likely to replace oaks

**Dominant Species\* and Canopy Position**

QUPR2 Upper  
QUCO2 Upper  
PIVI2 Mid-Upper  
PIRI Upper

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** 8

**Structure Data (for upper layer lifeform)**

	Min	Max
Cover	50 %	75 %
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:

### **Class C**      25%

**Mid1 Open**

**Description**

Mid-development (15-60 years), open canopy. Woodland with herbaceous and/or low ericaceous understory. Oak with shortleaf, pitch or Virginia pine (occasionally table-mountain on xeric sites) < 50% canopy cover.

**Dominant Species\* and Canopy Position**

QUPR2 Upper  
PIRI Upper  
CAPE6 Lower  
DASP2 Lower

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** 2

**Structure Data (for upper layer lifeform)**

	Min	Max
Cover	25 %	50 %
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:

ground layer (herbs and sometimes dwarf shrubs) often exceeds tree cover

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**Class D 50%**

Late I Open

**Description**

Late-development (>60 years), open canopy pine-oak to oak-pine in composition. Late-seral woodland pine and oak overstory with perennial grasses and limited shrub community. < 50% canopy cover.

**Dominant Species\* and Canopy Position**

QUPR2 Upper  
 QUCO2 Upper  
 CAPE6 Lower  
 DASP2 Lower

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model 2**

**Structure Data (for upper layer lifeform)**

	Min	Max
Cover	25 %	50 %
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: ground layer (herbs and sometimes dwarf shrubs) often exceeds tree cover.

**Class E 15%**

Late I Closed

**Description**

Late-seral (> 60 years), closed canopy, oak dominated overstory community with little herbaceous cover. May have a dense woody shrub understory layer. Canopy gaps occupying 1- 2%, larger openings represent 1- 2% of landscape respectively > 50% canopy cover (crown closure estimate).

**Dominant Species\* and Canopy Position**

QUPR2 Upper  
 QOCO2 Upper  
 PIST Upper

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model 8**

**Structure Data (for upper layer lifeform)**

	Min	Max
Cover	50 %	75 %
Height	Tree Medium 10-24m	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:

**Disturbances**

**Disturbances Modeled**

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

**Historical Fire Size (acres)**

Avg: 100  
 Min: 50  
 Max: 500

**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	185			0.00541	4
Mixed	110			0.00909	7
Surface	8			0.125	90
All Fires	7			0.1395	

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