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)

R5OHSA **Oak-Hickory Savanna**

General Information

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

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Vegetation Type

Woodland

Dominant Species*

QUST
QUMA
SCHIZ

General Model Sources

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

LANDFIRE Mapping Zones

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Rapid AssessmentModel Zones

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

Geographic Range

This PNVG is located in East Texas, adjacent to and surrounding Blackland prairie from near the coast extending north to the southern extent of the Cross timbers as described by Dyksterhuis.

Biophysical Site Description

This PNVG occurs on irregular plains of sand to sandy loam Ustalf soils. Soils are shallow to moderately deep.

Vegetation Description

The vegetation is dominated by Post oak (Quercus stellata) and to a lesser extent blackjack oak (Q. marilandica), a minor compontnt of hickory (Carya spp.) also is a constituent. In open conditions the understory and canopy openings are dominated by little bluestem (Schizachyrium scoparium) and various annual and perennial forbs with prevalence dictated by stand density and overstory canopy cover. In closed canopy conditions, groundcover has little to no herbaceous cover and is dominated by oak leaf litter. Other important woody plants include greenbriar (Smilax spp.), sumac (Rhus spp.) and poison ivy (Toxicodendron radicans). Species that may invade include Prosopis glandulosa to the south and Juniperus virginiana and Juniperus ashei.

Disturbance Description

This PNVG is in fire regime group I, with frequent surface fires, both lightning and anthropogenic in origin (Stewart 1951, 2002; Jurney et al. 2004). Frequent anthropogenic fire was important for perpetuation of this type (Stewart 1951, 2002). Further, frequency approaching annual burning is cited in numerous historical references (Denevan 1992; Stewart 1963, 2002). Historic fires have been documented during all seasons (Stewart 2002, Jurney et al. 2004) dependant on the availability of dry fine fuels sufficient to carry a fire and likely edaphic and microsite constraints. Bison grazing likely influenced fire patterns and thus the landscape patterns. Bison and other grazing/browsing wildlife species preferentially seek out the new growth of recently burned areas affecting patch composition (Fuhlendorf and Engle 2004). Using the

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

fire/bison interaction model first proposed by Steuter (1986) recent modifications propose that anywhere from 1/6 to 1/3 of a 20,000 acre (8,094 hectares) landscape likely burned (Fuhlendorf and Engle 2004). Likely this was less in oak savanna. This caused earlier green-up and increased nutrient content of native grasses.

Adjacency or Identification Concerns

This PNVG is distinct from adjacent blackland prairie that may be either to the west or east or in the adjacent eastern north to south bands bordering oak-hickory-pine.

Scale Description

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

The landscape was a matrix of woodland and blackland prairie, with some dissection of this type by small rivers and streams. The landscape for this type is 6-8 million acres.

Issues/Problems

Model Evolution and Comments

Paul Harcomb, Rice University. David Jurney, Ozark-St. Francis National Forest, Russellville, Arkansas

*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

Oak reproduction (often coppice) to 15' tall. Community of forbs and perennial grasses. More persistent on shallow soils. Openings may be small to extensive and have scattered live trees. 0-19 years of age.

Dominant Species* and Canopy Position

QUST	Upper
QUMA	Mid-Upper
SCHIZ4	Lower

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	100 %
Height	Tree Regen <5m	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:

Early on dominated by tallgrasses but as coppice regeneration develops will tend towards a dense stand that shades out grasses

Fuel Model 3

Class B 2 %

Mid1 Closed

Description

Mid-seral with closed canopy (>60%) sapling to pole-sized oak with little or no herbaceous understory. Often coppice origin. 20-79 years of age.

Dominant Species* and Canopy Position

QUST	Upper
QUMA	Mid-Upper

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Structure Data (for upper layer lifeform)

	Min	Max
Cover	60 %	100 %
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:

Fuel Model 9

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Class C 40 %

Mid1 Open

Description

Mid-seral woodland/savanna overstory with perennial grasses. Cover <60%. 20-79 years of age.

Dominant Species* and Canopy Position

QUST Upper
QUMA Mid-Upper
SCHIZ4 Lower

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 3

Structure Data (for upper layer lifeform)

	Min	Max
Cover	20 %	60 %
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:

Class D 40 %

Late1 Open

Description

Mid-seral woodland/savanna oak overstory with perennial grasses. Cover <60%. 80 years plus in age.

Dominant Species* and Canopy Position

QUST Upper
QUMA Mid-Upper
SCHIZ4 Lower

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 3

Structure Data (for upper layer lifeform)

	Min	Max
Cover	20 %	60 %
Height	Tree Medium 10-24m	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 3 %

Late1 Closed

Description

Late-seral, closed canopy (>60%) oak dominated overstory community. Little to no herbaceous cover and few shrubs. 80 years plus in age.

Dominant Species* and Canopy Position

QUST Upper
QUMA Mid-Upper

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 9

Structure Data (for upper layer lifeform)

	Min	Max
Cover	60 %	100 %
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

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Disturbances Modeled

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

Historical Fire Size (acres)

Avg: 1000
Min: 100
Max: 10000

Sources of Fire Regime Data

- [x] Literature
- [ ] Local Data
- [x] 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	227			0.00441	1
Mixed	2000			0.0005	0
Surface	3.2			0.3125	98
All Fires	3			0.31741	

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