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 2004-2005. For more information, please visit www.landfire.gov. Please direct questions to helpdesk@landfire.gov.

Potential Natural Vegetation Group (PNVG):

R5MQSA **Mesquite Savanna**

General Information

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

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Vegetation Type

Woodland

Dominant Species*

PRGL2 SCSCL
ZAFA TRPL3
ALGR2
OPLI

General Model Sources

☐ Literature
☐ Local Data
☑ Expert Estimate

LANDFIRE Mapping Zones

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Rapid Assessment Model Zones

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

Geographic Range

This PNVG ranges across southern Texas, Nuevo Leon, and Tamaulipas Mexico.

Biophysical Site Description

This type occurs on the coastal plain of southern Texas, on various soil types. The best developed representatives occur on deep sands such as occur on the sandsheet of Kenedy, southern Kleberg, northern Willacy and Brooks counties, Texas. Mesquite savanna can also be found on other Tertiary and Quaternary deposits throughout the gently sloping plain from Del Rio, Texas eastward. The type typically occurs on deeper soils and the climate is characterized by drought conditions, with aridity increasing from east to west.

Vegetation Description

Historical accounts suggest that the habitat was an open grassland, with scattered clumps of mesquite and associated shrubs. The scattered clumps within the sandsheet have mesquite (Prosopis glandulosa) forming a nursery for the development of clumps of other shrub species, which may grow in aerial extent and coalesce into more continuous shrub cover.

Disturbance Description

The natural range of variation in disturbance within this vegetation is difficult to assess currently, because of dramatic changes resulting from severe overgrazing and the resultant changes in vegetation dynamics in the region which occurred in the early to mid-1800's. While few experts argue that this was a major habitat type of the region, the historic extent of mesquite savanna is arguable. Periodic fire likely maintained the habitats as an open savanna. The average fire return interval is 6 years. Periods of overgrazing apparently led to an alternative stable state in which fire does not play a significant role, and the habitat has become a closed shrubland community with little to no opportunity for reverting to mesquite savanna.

Adjacency or Identification Concerns

Mesquite savanna may occur in conjunction with what is now stable Tamaulipan thornscrub which lacks recurring fire. Some of this shrubland occurs on thin soil over indurate caliche. These thin soil shrublands may have occurred historically and never shared the fire cycle of other shrublands, mesquite woodlands and savannas. Deeper and tighter soils associated with drainages have a denser mesquite woodland, and probably had a somewhat more restricted fire regime. Likewise, riparian woodlands can be found associated with Quaternary alluvium along drainages.

Scale Description

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

Scale of disturbance is generally a function of increasing aridity towards the west, probably resulting in a generally longer fire return interval towards the west. Likewise, the landscape of the region to the west is somewhat more dissected by riparian and stringers of mesquite woodlands (known as ramaderos), as compared to the relatively level, topographically less diverse sandsheet where fire interval is shorter and scale is larger.

Issues/Problems

The main problem is in the generalization of this type to a large region. Areas that may be mapped as this PNVG may also contain tall and short thornscrub that is unlikely to revert to mesquite savanna. Some small proportion of the native grazing effect on the Late Open (D) will drive the system towards Late Closed (B). Introduction of fire into the existing system is a difficult proposition and will not immediately return the system to the depicted process.

Model Evolution and Comments

Tim Fulbright, Texas A&M University-Kingsville; Insight could be gained from review of this model by NRCS staff involved with Ecological Site descriptions in the region. Lynne Drawe, Welder Wildlife Foundation. Fire frequency was adjusted from 200 years in class B to 100 years as a result of peer review.

Succession Classes

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

Class A   2%

Early1 All Structures

Description

Grass cover is dominated by Pasplum setaceum, Setaria geniculata, Aristida sp., Bothriochloa barbinodis, Chloris pluriflora, Chloris verticillata, Bouteloua rigidiseta, and Bouteloua trifida, depending on the site. Schizachyrium scoparium and Paspalum plicatulum can dominate on sandy sites, particularly near the coast..

Indicator Species* and Canopy Position

PASE5	All
SEGE	All
ARIST	All
SCSC	All

Upper Layer Lifeform

☑ Herbaceous
☐ Shrub
☐ Tree

Fuel Model   1

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	100 %
Height	Herb Short <0.5m	Herb Medium 0.5-0.9m
Tree Size Class	no data	

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

Class B   15%

Late1 Closed

Description

Shrub clumps have coalesced into a continuous shrub canopy with occasional emergent mesquite. Herbaceous components generally lacking. Shrub component is highly diverse.

Indicator Species* and Canopy Position

PRGL2	Upper
ZAFA	Middle
ZIOB	Middle
ACRI	Middle

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 4

Structure Data (for upper layer lifeform)

	Min	Max
Cover	20 %	30 %
Height	Shrub Medium 1.0-2.9m	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:

Shrub 40 to 90% cover, 0.75 to 2 m height

Class C   30%

Mid1 Open

Description

Predominately grassland with scattered clumps of shrubs. Mesquite sometimes emergent in the canopy with shrub clumps associated with this scattered overstory.

Indicator Species* and Canopy Position

PRGL2	Upper
SCSC	Lower
TRPL3	Lower
BOBA3	Lower

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 1

Structure Data (for upper layer lifeform)

	Min	Max
Cover	1 %	15 %
Height	Shrub Medium 1.0-2.9m	Tree Medium 10-24m
Tree Size Class	Pole 5-9" DBH	

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

Herbaceous 50 to 80% cover, 0.3 to 1 m.

Class D   53%

Late1 Open

Description

Larger scattered clumps of shrub species with mesquite forming the nucleus for shrub clumps. Schizachyrium more common in the eastern portion of the area, less common to the west.

Indicator Species* and Canopy Position

PRGL2	Upper
ZAFA	Middle
TRPL3	Lower
SCSC	Lower

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 5

Structure Data (for upper layer lifeform)

	Min	Max
Cover	5 %	20 %
Height	Shrub Tall >3.0 m	Tree Short 5-9m
Tree Size Class	Medium 9-21"DBH	

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

Herbaceous 50 to 80% cover, 0.3 to 1 m.

Class E   0%

Late1 Closed

Description

Indicator Species* and Canopy Position

Upper
Lower

Structure Data (for upper layer lifeform)

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

Upper Layer Lifeform

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

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model no data

Disturbances		

Non-Fire Disturbances Modeled

☐ Insects/Disease
☑ Wind/Weather/Stress
☑ Native Grazing
☐ Competition
☐ Other:
☐ Other:

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

Historical Fire Size (acres)

Avg:
Min:
Max:

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 the 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.

Sources of Fire Regime Data

☐ Literature
☐ Local Data
☑ Expert Estimate

	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
Replacement	100			0.01	5
Mixed	150			0.00667	4
Surface	6			0.16667	91
All Fires	5			0.18333	

References		

Archer, S., C. R. Basham, and R. Maggio. 1988. Autogenic succession in a subrtopical savanna: conversion of grassland to thorn woodland. Ecological Monographs 58(2): 111-127.

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