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)

R3OCWO   **Madrean Oak Conifer Woodland**

General Information

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

Modelers		**Reviewers**
Tyson Swetnam	tswetnam@u.arizona.edu	
Reese Lolley	rlolley@fs.fed.us	

Vegetation Type

Woodland

Dominant Species*

JUDE2
QUEM
PILE
MUM

General Model Sources

☑ Literature
☐ Local Data
☑ Expert Estimate

LANDFIRE Mapping Zones

14	24	28
15	25	
23	27	

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

Southern Arizona, southern New Mexico, and western Texas.

Biophysical Site Description

The oak and conifer woodlands of the interior Southwest is described by Brown (1994) as having open evergreen oaks, alligator bark junipers, and Mexican pines that range from 15 to 50 feet (6-15 meters) in height with an understory dominated by grasses.

Kuchler (1964) includes this type within type number 31, the oak-juniper woodland. For the coarse-scale PNVGs this type was included in type number 26, Chaparral. This PNV type is included in Bailey's (1995) and McNab and Avers (1994) Ecoregions within the Chihuahuan Semi-Desert province, Basin and range section(321A), and the Arizona-New Mexico Semi-desert Mountains province (M313) within the White Mountain-San Francisco Peaks Section (M313A) and Sacramento-Monzano Mountain Section (M313B).

Vegetation Description

The natural vegetation structure was dominated by open late seral woodland on slopes and ridges transitioning to somewhat closed woodland in draws and on rocky slopes, with interspersed patches of early and mid seral structures resulting from stand replacement fire. Shrubs and forbs were low density scattered throughout. Species dominating the natural regime include alligator juniper (Juniperus deppeana), emory oak (Quercus emoryi), mountain muhly (Mulenbergia montana), sideoats gramma (Bouteloua curtipendula), and blue gramma (Bouteloua gracilis). Climax indicator species include alligator juniper (Juniperus deppeana) and one-seed juniper (Juniperus osteosperma) at lower elevations; Chihuahuan Pine (Pinus lieophylla), Apache Pine (Pinus engelmannii), and Pinyon pine (Pinus spp.) at higher elevations. Madrean oaks (Quercus spp.), Arizona Madrone (Arbutus arizonica), and various shrubs may be codominant.

Disturbance Description

Regime I (frequent surface- and mixed severity fires) with fire intervals generally ranging from 5-20 years

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

long (approx. 10-yr MFI; Brown and Smith 2000, USDA 2002). Large-diameter alligator junipers and evergreen oaks often survive 1 to 3 low intensity fires resulting in "cat face" scars with char at the base of the tree, whereas Mexican pines can survive multiple low intensity fires. Fire severity can be mixed in both space and time, for example, high-severity fires can occur on relatively productive sites, or during extreme fire weather and prolonged droughts. Alligator juniper and evergreen oaks that are top killed by fire resprout, indicating adaptation to frequent fire, but not to very frequent fire (less than 6 years), which would eliminate these species. Severity of fire is likely mixed in both space and time. In years when fire burned in very dry conditions, with considerable grassy fuel and wind, they would likely burn as surface fires on gentle terrain, but open up patches on steeper terrain and in wide draws where tree canopies tend to be more dense. In other years when fire burned in more moist conditions, without wind, or as backing fires, they likely would burn much of the area as surface fires. Greater than 120 day burning days with primary seasons of May-July and September-October. We estimate a range from 6 to 20 years with a mean fire interval of 10 years (Swetnam and Baisan 1996).

Drought was likely the most common natural disturbance in addition to fire. Fire years generally coincide with moist periods that produced considerable grassy fuel, followed by a dry period. Grazing by large ungulate herds may have caused some disturbance and interacted with fire and drought.

Adjacency or Identification Concerns

This PNV can be confused with the Great Basin Conifer Woodland type of Brown (1994), the juniper-pinyon or juniper steppe types of the coarse-scale type PNVGs (Schmidt et al. 2002) and Kuchler (1964) PNV. The presence of old, often large diameter, mushroom shaped alligator juniper, evergreen oaks, and long needle pines that are older than post-Euro-American settlement, with scattered old, large diameter logs are good indicators of this type. Site indicator species include alligator juniper, oaks, mountain muhly, blue gramma, and sideoats gramma.

Scale Description

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

Typical landscapes in this PNV form a zone between the warmer and dryer Plains Mesa Grassland at lower elevations and the moister Woodland-Grassland Complex on slopes and mesas at higher elevations. Contiguous landscapes of this PNV can range from as small as a quarter section (160 acres) to as large as a township (36 sections, 23,000 acres).

Issues/Problems

Model Evolution and Comments

This model is based on the original FRCC model OCWI was renamed R3OCWO in the Albuquerque workshop.

This model did not receive any 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   9 %

Early1 PostRep

Description

Post-fire grass and fire-adapted forbs: herbaceous life form with 10-30 % canopy and 20% average; mountain muly, blue gramma, sideoats gramma, asters, penstemons, sprouting shrubs

Dominant Species* and Canopy Position

MUMO
BOGR2
BOCU

Upper Layer Lifeform
☐ Herbaceous
☐ Shrub
☐ Tree

Structure Data (for upper layer lifeform)

	Min	Max
Cover	10 %	20 %
Height	no data	no data
Tree Size Class	no data	

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

Fuel Model   no data

Class B   10 %

Mid1 Closed

Description

Mid-seral woodland, typically in more productive draws and northerly aspects: woodland life form with 15-70% canopy, average of 55%; alligator juniper, oaks, mahogany, mountain muly, blue gramma

Dominant Species* and Canopy Position

JUDE2
QUEM
MUMO
PILE

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model   no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	15 %	70 %
Height	no data	no data
Tree Size Class	no data	

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

Class C   10 %

Mid1 Open

Description

Mid-seral grasslands on southerly slopes & ridges: grass dominated herbaceous life form with species such as mountain muhly, blue gramma, and sideoats gramma; 25-65% herbaceous cover; 5-15% canopy of scattered trees and shrubs, such as alligator juniper, oaks;

Dominant Species* and Canopy Position

MUMO
JUDE2
QUEM
PILE

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model   no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	5 %	15 %
Height	no data	no data
Tree Size Class	no data	

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

Class D   70 %

Late1 Open

Description

Late-seral open woodland on slopes & ridges: woodland life form with 5-35% canopy, 25% average; alligator juniper, oaks, mountain muly, blue gramma, sideoats gramma;

Dominant Species* and Canopy Position

MUMO
JUDE2
QUEM
PILE

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model   no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	5 %	35 %
Height	no data	no data
Tree Size Class	no data	

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

Class E   1%

Late1 Closed
Description
Late-seral closed woodland typically in draws or on steep rocky or thin soil slopes & ridges: woodland life form with 35-70% canopy, average of 55%;alligator juniper, oaks, mahogany, scattered shrubs and grasses

Dominant Species* and Canopy Position
JUDE2

QUEM

PILE

MUMO

Upper Layer Lifeform
☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model   no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	35 %	70 %
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
☑ Fire
☑ Insects/Disease
☑ Wind/Weather/Stress
☑ Native Grazing
☐ Competition
☐ Other:
☐ Other

Historical Fire Size (acres)
Avg: no data
Min: no data
Max: no data

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	25	45	0.01538	16
Mixed	140	5	25	0.00714	8
Surface	14	1	20	0.07143	76
All Fires	11			0.09396	

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

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