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)

R3PIJUrf **Pinyon Juniper - Rare Replacement Fire Regime**

General Information

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

Modelers		Reviewers	
Ed Biery	ehbiery@fs.fed.us	William L. Baker	bakerwl@uwyo.edu
Kara Paintner	kara_paintner@nps.gov	Tim Christiansen	christta@wsmr.army.mil
Bill Baker	bakerwl@uwyo.edu	Brenda Wilmore	bwilmore@fs.fed

Vegetation Type

Woodland

Dominant Species*

pied
juos
jumo
jusc2

General Model Sources

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

LANDFIRE Mapping Zones

14 24 28
15 25
23 27

Rapid AssessmentModel Zones

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

Geographic Range

Found throughout the region. This type is usually the lowest elevation tree-dominated type in the area, and is found on lower mountain slopes, mesas, and on adjacent plains.

Biophysical Site Description

This type is found on many sites, ranging from deep, well drained soils on nearly flat slopes, to shallow, steep and rocky sites. Rather than being associated with a particular soil type and climatic regime, this type appears to be restricted to an unusual combination of soils and topographic conditions that protect the stands from frequent fires (Romme, et al. 2003).

Vegetation Description

This type is usually dominated by PIED, with lesser amounts of JUMO, JUOS, JUSC2, and PIPO, though in some regions juniper may dominate over pinyon. The most common shrub associates are QUGA, CEMO2, YUGL, opuntia spp., and ephedra. It has a sparse to absent understory of grasses, subshrubs, and forbs.

Disturbance Description

Fire regimes for pinyon-juniper woodlands are difficult to reconstruct owing to scant fire scar evidence (Baker and Shinneman 2004). Disturbance by fire in this type is primarily either stand replacement or single-tree. There is little fire importation from adjacent types. However, there is much controversy and uncertainty surrounding fire frequencies in pinyon-juniper systems, and a contrasting pinyon-juniper model (R3PIJUff) with no relatively frequent mixed severity fire should be also be examined.

Adjacency or Identification Concerns

At upper elevations, this PNVG grades into ponderosa pine and/or Gambel oak/Cercocarpus shrubland, and it abuts shortgrass prairie (in the east) and desert scrub (in the west) on the lower end. It may abut the pinyon-juniper mixed fire regime (R3PIJUff) type at lower elevations.

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

Some areas have extensive mortality since 2002 due to the drought-induced IPS beetle outbreak.

This PNVG may be similar to the PNVG R2PIJU from the Great Basin model zone

Scale Description

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

The most common disturbance in this type is very small-scale - either single-tree, or small groups. If the conditions are just right, then it will burn whole stands up to 1000's of acres.

Issues/Problems

Model Evolution and Comments

Based on the original FRCC model JUPI2.

This seems to be a combination of:CES304.767 Colorado Plateau Pinon-Juniper Woodland and CES306.835 Southern Rocky Mountain. Pinyon-Juniper Woodland.

Peer review of this type was generally favorable, although some confusion over the difference between this and the mixed-fire regime pinyon juniper (R3PIJUff) type exists. Because of the time frame of the Rapid Assessment and the relative uncertainty surrounding pinyon-juniper fire history, the issue was unresolved and both models were unchanged.

*Succession Classes***

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

Class A 10 %

Early1 All Struct

Description

Grass/forb/shrub/seedling - usually post-fire.

Dominant Species* and Canopy Position

grass
forb
shrub
seedling

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	0 %	25 %
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 B 15 %

Mid1 Closed

Description

Mid-development, dense (>40% cover) pinyon-juniper woodland; understory being lost

Dominant Species* and Canopy Position

pied
jumo
jusc2
juos

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	40 %	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:

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Class C 5 %

Mid1 Open

Description

Mid-development, open (<40% cover) pinyon-juniper stand with mixed shrub/herbaceous community in understory

Dominant Species* and Canopy Position

pied
jumo
juos
jusc2

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	10 %	40 %
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 10 %

Late1 Open

Description

Late-development, open juniper-pinyon stand
with "savannah-like" appearance; mixed
grass/shrub/herbaceous community.

Dominant Species* and Canopy Position

pied
jumo
juos
jusc2

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	10 %	40 %
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 60 %

Late1 Closed

Description

Dense, old-growth stands with multiple layers. Late-development, closed pinyon-juniper forest. May have all-aged, multi-storied structure. Moderate mortality within stand.
Occasional shrubs with few grasses and
forbs and often much rock.

Dominant Species* and Canopy Position

pied
jumo
juos
jusc2

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	40 %	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

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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: **5**

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	526			0.00190	76
Mixed	2000			0.0005	20
Surface	10000			0.0001	4
All Fires	400			0.00250	

References

Baker, W.L. and D.J. Shinneman. 2004. Fire and restoration of piñon-juniper woodlands in the western United States: a review. Forest Ecology and Management 189: 1-21.

Floyd, M.L., W.H. Romme, and D.D. Hanna. 2000. Fire history and Vegetation Pattern in Mesa Verde National Park, Colorado, USA. Ecological Applications 10, 1666-1680.

Romme, W.H., L. Floyd-Hanna, and D.D. Hanna. 2003. Ancient piñon-juniper forests of Mesa Verde and the West: A cautionary note for forest restoration programs. In: Proceedings of the conference on Fire, Fuel Treatments, and Ecological Restoration: Proper Place, Appropriate Time, pp. 335-350. Colorado State University, April 2002. USDA Forest Service General Technical Report RMRS-GTR.

Stein, Steven J. 1988. Fire History of the Paunsaugunt Plateau in Southern Utah. Great Basin Naturalist. Vol. 48, No. 1: 58-63.

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