

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

### Potential Natural Vegetation Group (PNVG):

R3PIJUff

Pinyon Juniper - Mixed Fire Regime

### General Information

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

#### Modelers

Ed Biery                      ehbiery@fs.fed.us  
Kara Paintner                kara\_paintner@nps.gov

#### Reviewers

William L. Baker            bakerwl@uwyo.edu  
Barry Johnston              bcjohnston@fs.fed.us

#### Vegetation Type

Woodland

#### Dominant Species\*

jumo  
juos  
pied  
pipo

#### General Model Sources

- Literature  
 Local Data  
 Expert Estimate

#### LANDFIRE Mapping Zones

14	24	28
15	25	
23	27	

#### Rapid Assessment Model Zones

- |  |   |
|--|---|
| <input type="checkbox"/> California      | <input type="checkbox"/> Pacific Northwest    |
| <input type="checkbox"/> Great Basin     | <input type="checkbox"/> South Central        |
| <input type="checkbox"/> Great Lakes     | <input type="checkbox"/> Southeast            |
| <input type="checkbox"/> Northeast       | <input type="checkbox"/> S. Appalachians      |
| <input type="checkbox"/> Northern Plains | <input checked="" type="checkbox"/> Southwest |
| <input type="checkbox"/> N-Cent.Rockies  |   |

#### Geographic Range

Found throughout the region, but more common on the west side of the Colorado Plateau. 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.

#### Vegetation Description

This type is dominated by JUOS (west of the continental divide) and JUMO (east), with lesser amounts of PIED, PIPO, and JUSC2. The most common shrub associates are ARTRV, QUGA, CEMO2, 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). Fire regimes in pinyon-juniper were dominated by very infrequent replacement fire (see also R3PIJUrf), but in some cases may have had somewhat frequent mixed severity fire (top-kill of 25-75% of overstory vegetation) (Rondeau 2001). There can be frequent fire importation from adjacent types. Mixed severity fire was modeled here at ~200 year MFI. However, there is much controversy and uncertainty surrounding fire frequencies in pinyon-juniper systems, and the contrasting pinyon-juniper model (R3PIJUrf) with no mixed severity fire should be also be examined.

#### Adjacency or Identification Concerns

At upper elevations this type grades into pinyon-juniper with rare replacement fire (R3PIJUrf), ponderosa pine, and/or Gambel oak/Cercocarpus shrubland. It abuts sagebrush and desert scrub on the lower end.

\*Dominant and Indicator 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 have replacement fires that burn stands up to 1000's of acres. This type may also have mixed-severity fires of 10-100's of acres.

**Issues/Problems**

**Model Evolution and Comments**

This model was developed base on two previous models: the original FRCC JUPII PNVG and a model developed by an interagency team working on a fire management plan for the Greater Sand Dunes area in southern Colorado (called Pjsangre). Although references were not provided for the Pjsangre model, we adopted the 170-year MFI for mixed severity fire used in it because of the collaborative expertise that went into that model. This type is a combination of the following Ecological Systems: CES304.767 Colorado Plateau Pinon-Juniper Woodland and CES306.835 Southern Rocky Mountain. Pinyon-Juniper Woodland.

Peer review of this type was mixed. One reviewer strongly recommended dropping this type entirely and using only the pinyon-juniper rare fire model (R3PIJUrf), based on studies showing no evidence of mixed severity fire in pinyon juniper. 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 Structures

**Description**

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

**Indicator 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:

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

**Class B 20 %**

Mid1 Closed

**Description**

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

**Indicator Species\* and Canopy Position**

ped  
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:

**Class C 25 %**

Mid1 Open

**Description**

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

**Indicator Species\* and Canopy Position**

ped  
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 35 %**

Late1 Open

**Description**

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

**Indicator Species\* and Canopy Position**

ped  
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:

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

**Class E 10 %**

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.

**Indicator Species\* and Canopy Position**

ped  
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**

**Non-Fire Disturbances Modeled**

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

**Fire Regime Group: 3**

- 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 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.

**Historical Fire Size (acres)**

Avg:  
Min:  
Max:

**Sources of Fire Regime Data**

- Literature
- Local Data
- Expert Estimate

	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
Replacement	430			0.00233	29
Mixed	192			0.00521	65
Surface	2000			0.0005	6
All Fires	124			0.00803	

**References**

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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.

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

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Rondeau, Renee, 2001. Ecological System Viability Specifications for Southern Rocky Mountain Ecoregion. Colorado Natural Heritage Program. 181p.

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