

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

### Potential Natural Vegetation Group (PNVG)

R3PPGO Ponderosa Pine Gambel Oak - Southern Rockies and Southwest

### General Information

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

#### Modelers

Jeff Redders [jredders@fs.fed.us](mailto:jredders@fs.fed.us)  
Bill Baker [bakerwl@uwyo.edu](mailto:bakerwl@uwyo.edu)  
Rosemary Sherriff [sherriff@colorado.edu](mailto:sherriff@colorado.edu)

#### Reviewers

Barry Johnston [bcjohnston@fs.fed.us](mailto:bcjohnston@fs.fed.us)  
Brenda Wilmore [bwilmore@fs.fed.us](mailto:bwilmore@fs.fed.us)

#### Vegetation Type

Forested

#### General Model Sources

- Literature  
 Local Data  
 Expert Estimate

#### Rapid Assessment Model Zones

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

#### Dominant Species\*

PIPO  
QUGA

#### LANDFIRE Mapping Zones

14	24	28
15	25	
23	27	

#### Geographic Range

The Ponderosa Pine-Gambel Oak type includes Northern New Mexico and Arizona, West-Central and Southern Colorado, possibly Southern Utah.

#### Biophysical Site Description

The Ponderosa-Gambel Oak type ranges from 6,500-8,500 feet in elevation on a variety of topographic features, including mountains, mesas, and canyons. Mean annual precipitation ranges from about 16-25".

#### Vegetation Description

Gambel oak (*Quercus gambelii*) occurs primarily south of the northern Front Range region. For the ponderosa pine/Gambel oak type, there is an overstory canopy of ponderosa pine with a tall shrub Gambel oak understory.

#### Disturbance Description

For the Ponderosa Pine-Gambel Oak type -Mean composite surface fire intervals have been found to be 10-20 years (Romme et al. 2003; Grissino-Mayer et al. 2004). Infrequent stand-replacement fire on the order of a few hundred years (300-500?). Drought and other weather events (e.g., blowdown), parasites, and disease may play a minor role, have very long rotations. Mountain pine beetle is another significant disturbance agent with epidemic populations occurring about every 20 years. During the epidemics mortality can be extensive particularly in large-diameter stands with high stocking.

#### Adjacency or Identification Concerns

For the ponderosa pine/Gambel oak type, it could be difficult to separate young examples of this type that are temporarily dominated by Gambel oak from more permanent mixed mountain shrub stands dominated by Gambel oak that burn too frequently to become ponderosa pine dominated.

#### Scale Description

Sources of Scale Data  Literature  Local Data  Expert Estimate

landscape scale (thousands to tens of thousands of acres)--Romme et al. 2003.

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

**Issues/Problems**

Replacement fire rotation uncertain, and this affects the amount of forest in each class. Most of the Information for the Ponderosa Pine-Gamble Oak comes from the San Juans.

**Model Evolution and Comments**

Additional modeler included Jose Negron ( jnegron@fs.fed.us).

Fire interval data is the composite interval of 25% fire-scarred trees for all fires.

One review suggested that Fire Regime Group III would fit better than I, but reviews generally agreed with model parameters.

**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**

Openings dominated by oak, but includes ponderosa pine saplings and small trees. Some openings may persist. Gambel oak dominated due to resprouting (0-49 years), assuming about 50% canopy cover of Gambel oak before disturbance. Ponderosa pine individuals becoming established. This class could persist longer than 49 years if drought persists or ponderosa pine seed source is lacking.

**Dominant Species\* and Canopy Position**

QUGA  
PIPO

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** no data

**Structure Data (for upper layer lifeform)**

	Min	Max
Cover	0 %	90 %
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 5 %**

Mid1 Closed

**Description**

> 50% canopy cover dominated by small and medium diameter ponderosa pine trees. Small, medium, and some large ponderosa pine (50-149 years) dominated but still with 40-80% Gambel oak.

**Dominant Species\* and Canopy Position**

PIPO  
QUGA

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** no data

**Structure Data (for upper layer lifeform)**

	Min	Max
Cover	50 %	90 %
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 Species are from the NRCS PLANTS database. To check a species code, please visit <http://plants.usda.gov>.

**Class C 20%**

Mid1 Open  
**Description**

< 50% canopy cover of small and medium diameter ponderosa pine trees. Small, medium, and some large ponderosa pine (50-149 years) still with high cover (30-70%) of Gambel oak. Older stands developing old-growth attributes, such as downed wood, snags, and diseased trees. Includes variability in tree density, from more open patches to dense patches.

**Dominant Species\* and Canopy Position**

PIPO  
QUGA

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** no data

**Structure Data (for upper layer lifeform)**

	Min	Max
Cover	10 %	49 %
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 55%**

Late1 Open  
**Description**

< 50% canopy cover dominated by large diameter (> 30 cm) ponderosa pine trees. Gambel oak subdominant. Large and very large old growth ponderosa pine, still with high cover (30-70%) of Gambel oak. Old growth attributes prominent, including down wood, snags, diseased trees.

**Dominant Species\* and Canopy Position**

PIPO  
QUGA

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** no data

**Structure Data (for upper layer lifeform)**

	Min	Max
Cover	10 %	49 %
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 10%**

Late1 Closed  
**Description**

> 50% canopy cover dominated by large diameter (> 30 cm) ponderosa pine trees. Gambel oak in the southern range. Large and very large old growth ponderosa pine, still with high cover (30-60%) of Gambel oak. Old growth attributes prominent, including down wood, snags, diseased trees.

**Dominant Species\* and Canopy Position**

PIPO  
QUGA

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** no data

**Structure Data (for upper layer lifeform)**

	Min	Max
Cover	50 %	90 %
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: 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.

	<i>Avg FI</i>	<i>Min FI</i>	<i>Max FI</i>	<i>Probability</i>	<i>Percent of All Fires</i>
<i>Replacement</i>	300			0.00333	8
<i>Mixed</i>		50	100		
<i>Surface</i>	25	10	30	0.04	92
<i>All Fires</i>	23			0.04334	

**References**

Grissino-Mayer, H.D., Romme, W.H., Floyd-Hanna, M.L., Hanna, D. 2004. Climatic and human influences on fire regimes of the southern San Juan Mountains, Colorado, USA. Ecology 85(6): 1708-1724.

Romme, William H.; Jamieson, David W.; Redders, Jeffery S.; [and others]. 1992. Old-growth forests of the San Juan National Forest in southwestern Colorado. In: Kaufmann, Merrill R.; Moir, W. H.; Bassett, Richard L., technical coordinators. Old-growth forests in the Southwest and Rocky Mountain regions: Proceedings of a workshop; 1992 March 9-13; Portal, AZ. Gen. Tech. Rep. RM-213. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 154-165.