

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)

R3QUGA Gambel Oak

General Information

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

Modelers

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Vegetation Type

Shrubland

General Model Sources

- Literature
 Local Data
 Expert Estimate

Rapid Assessment Model Zones

- | | |
|---|---|
| <input type="checkbox"/> California | <input type="checkbox"/> Pacific Northwest |
| <input checked="" 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 | |

Dominant Species*

QUGA
AMUT
CAGE
stle4

LANDFIRE Mapping Zones

14	24	28
15	25	16
23	27	

Geographic Range

Gambel oak occurs primarily in Colorado, New Mexico, Utah (Wasatch Front), Arizona and southeastern Wyoming. In the southern extent of its distribution, Gambel oak occupies a minor role as an associate with Ponderosa Pine and mixed conifer habitats. Moving north, long-lived Gambel oak clones form dominant to mono-typic overstories. (FEIS-2004)

Biophysical Site Description

In Colorado, Gambel oak occurs between 6,000 and 9,000 feet on all aspects. At higher elevations it is more predominant on southern exposures. Gambel oak is typically a riparian species in New Mexico, occurring from 6,580 to 8,080 feet within the Black and Sacramento Mountain ranges. In Arizona Gambel oak occurs as a shrub thicket or as a tree throughout the Ponderosa pine habitat at elevations ranging from 8,000 to 8,600 feet. In Utah, Gambel oak is a dominant species in the central Utah mountain brush zone at 6,500 to 7,800 feet on southern exposures. On northern exposures Gambel oak shares dominance with bigtooth maple or is completely replaced by bigtooth maple (Simonin 2000).

Vegetation Description

Gambel oak occurs as the dominant species ranging from dense thickets to clumps associated with serviceberry or sagebrush. Gambel oak generally has a well-developed understory comprised of snowberry, elk sedge, letterman's needlegrass, poa ampla, yarrow, lupine, and goldenrod.

Disturbance Description

The primary disturbance mechanism is replacement fire or mixed-severity fire resulting in 25-75% top-kill, but rare mortality. Depending on surrounding communities, fire frequency in Gambel oak may range from 20 years (Simonin 2000) to 100 years (Floyd et al. 2000). Gambel oak responds to fire with vigorous sprouting from the root crown. Larger forms may survive low-intensity surface fire. Extended drought also contributes to disturbance.

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

Adjacency or Identification Concerns

This PNVG is characterized by > 80% Gambel oak. This type merges with the mountain shrub PNVG (R3MSHB) at lower elevations and grades into ponderosa pine and pinyon juniper types at higher elevations.

Scale Description

Sources of Scale Data Literature Local Data Expert Estimate

Scale ranges from 10 to 1000's of acres

Issues/Problems

This effort models Gambel oak as a climax species. One Rapid Assessment technical modeling rule was violated (a disturbance--native grazing-- accelerates age). It was left in the model because it captures a real ecological function (i.e., disturbance accelerating succession).

Model Evolution and Comments

Peer review for this type suggested that R3MSHB and R3QUGA be combined and have a total MFI of 100 years with no mixed or surface fires. The R3QUGA model was unchanged, but the R3MSHB model was modified slightly.

This PNVG replaces the model R2CHAPin from the Great Basin only for mapzone 16 of the Great Basin.

Succession Classes**

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

Class A 5%

Early1 PostRep

Description

Post-replacement sprouts to approximately 2' high. Dense resprouting with high number of stems/acre. Abundant grass and forb cover.

Dominant Species* and Canopy Position

CAGE2
STLE4
QUGA
SYOR2

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	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:

Class B 50%

Mid1 Closed

Description

3'-6' tall to 3" dbh. Stem mortality due to competition with slight decrease in understory species due to shading. Grass and forbs declining.

Dominant Species* and Canopy Position

QUGA
CAGE2
STLE4

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	20 %	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 15%

Late2 Open

Description

> 6' tall and > 3" dbh. Small stands < 30 meters across usually scattered throughout a grassland or shrub type (Brown 1958).

Dominant Species* and Canopy Position

QUGA
ARTRV
CAGE2

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	50 %	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 D 30%

Late1 Closed

Description

> 6' tall and 3" dbh. Nearly continuous stand 2 or more hectares in size with only occasional openings (Brown 1958).

Dominant Species* and Canopy Position

QUGA
CAGE2
STLE4
ACAG

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	70 %	100 %
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 0%

Late1 Closed

Description

Dominant Species* and Canopy Position

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	%
Height	no data	no data
Tree Size Class	no data	

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Fuel Model 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: 4

- 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>	50			0.02	75
<i>Mixed</i>	150			0.00667	25
<i>Surface</i>					
<i>All Fires</i>	37			0.02668	

References

Brown, H.E. 1958. Gambel oak in West-central Colorado. Ecology 39:317-327.

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.

Simonin, Kevin A. 2000. Quercus gambelli in Fire Effects Information System [Online]. USDA Forest Service, Rocky Mountain Research Station, Forestry Sciences Laboratory (producer).
 Www.fs.fed.us/database/feis/ [2004, October 28].

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