

## 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):

R1OAWD

California Oak Woodlands

### General Information

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

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#### Vegetation Type

Woodland

#### Dominant Species\*

QUDO  
QUCH2  
QUGA4  
QUEN

#### General Model Sources

- Literature  
 Local Data  
 Expert Estimate

#### LANDFIRE Mapping Zones

3            6  
4  
5

#### 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**

California-wide within Mediterranean climate zone, largely in foothill areas of Coast Range and Sierra Nevada.

#### **Biophysical Site Description**

Sea-level to 6000 ft elevation, on sites with relatively poor, shallow infertile soils. Blue oak and grasses dominated rolling foothill sites and higher elevation/upland sites with greater richness, including Arbutus, Aesculus, Pinus sabiniana, and some shrub species including Ceanothus spp. Arctostaphylos spp. and Adenostema fasciculatum.

#### **Vegetation Description**

Typical phases dominated by open cover oak savannah with relatively uniform mature trees at low densities (<40% cover), with understory vegetation structure a function of frequent surface fire mediating woody plant development. In some instances and in some sites tree density will increase to 70% or greater forming a relatively stable hardwood forest type subject to surface fires in the hardwood litter and rare stand replacement fire.

#### **Disturbance Description**

Overstory dominated by deciduous hardwood species results in an herbaceous surface fuel complex dominating fuel/fire influences. Typical regime is frequent, low-severity fire that likely exerts positive influence on overstory productivity and canopy resilience to fire damage. Infrequent isolated areas of stand replacement fire create gaps of grasslands that require patch-gap recruitment and edge recolonization over time. Grass fuels allow very frequent fire, up to annually. Fire regime likely strongly influenced by aboriginal ignitions. Areas dominated by greater species richness -- typically on higher elevations with understory shrub species and P. sabiniana result in higher intensity fire, and likely a greater proportion of stand replacement fire. Recruitment in the absence of fire appears to be slow, but a wide range of

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

disturbances - biotic and abiotic - influence the life history of oaks. Under grazing, seedling/sapling growth form may become more prostrate, and hence more susceptible to foliar combustion and direct fire related mortality. Complexity of grazing interactions not captured by this model version.

**Adjacency or Identification Concerns**

PNV group is often intermixed with chaparral and mixed evergreen forest types as well as ponderosa pine in the Sierra.

This PNVG may be similar to the PNVG R#OWOA for the Pacific Northwest Model Zone.

**Scale Description**

Sources of Scale Data  Literature  Local Data  Expert Estimate

Fire regime in grass surface fuel complexes likely were large in size, but limited in significant influence on overstory. Patches of stand replacement fire likely limited to individual or group of trees to 100 acres, with smaller gaps more prevalent.

**Issues/Problems**

Relatively wide variance in species associations and site productivity likely influences the frequency and extent of stand replacement fire events; however, the resiliency of the system to lack of fire (both in terms of vegetation and fuel changes) indicate that the model is likely relatively robust in determining significant disturbance effects on the distribution of phases and fire impacts on key ecosystem components.

**Model Evolution and Comments**

Main fire and fuel related issues in oak savannah/woodland systems concerns lack of fire where fire is an agent stimulating new regeneration, and grazing by domestic livestock adversely impacting successful recruitment of immature individuals into the mature phase. Wholesale replacement of native perennial grasses by annual grasses has likely led to increases in fuel continuity and a longer fire season, both contributing to increases in fire frequency in many areas. Increased frequency appears to favor a positive feedback for alien annual presence and abundance, thus causing a trend toward ecological instability when compared to pre-invasion ecosystem structure and function.

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

**Class A 15%**

Early1 PostRep

**Description**

post-replacement sapling/regeneration phase. Largely a function of either early seral remaining in early seral due to replacement fire, or to less common later seral replacement fire. Re-establishment can occur from basal resprouting or sexual reproduction, depending on composition, growth form, and seed dynamics. Patch size likely ranges from very small gap recruitment to areas approximately 100 acres. Diameter up to 4"

**Indicator Species\* and Canopy Position**

QUDO  
 QUCH2  
 QUGA4  
 PISA2

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** no data

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

	Min	Max
Cover	0 %	10 %
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>.

typical. May include interior and/or coast live oak, and a variety of shrubs.

**Class B 30 %**

Mid1 Open

**Description**

Intermediate phase from 20-60 years old -- some new recruitment of cohorts occurs in the later stages of this phase increasing tree density. Periodic surface fire is relatively common, but replacement fire rare due to low intensity fire type and resilience of typical species to top kill. Patch size in the hundreds of acres. Diameter up to 14" typical. May include interior and/or coast live oak, and a variety of shrubs.

**Indicator Species\* and Canopy Position**

QU DO  
QU CH2  
PI SA2  
QU GA4

**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 C 45 %**

Late1 Open

**Description**

Mature Oak Woodland phase -- highly stable, as most fire is frequent, low severity fire acting as maintenance agent. Tree density and canopy cover increase over time to relatively stable conditions. In some cases woody encroachment and increased tree density occurs under rare events of missed fire cycles. Some replacement fire occurs initiating secondary succession in early seral. Patch size in the hundreds to possibly thousands of acres. May include interior and/or coast live oak, and a variety of shrubs.

**Indicator Species\* and Canopy Position**

QU DO  
QU CH2  
QU GA4  
PI SA2

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** no data

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

	Min	Max
Cover	10 %	50 %
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 D 10%**

Late1 Closed

**Description**

Late seral stage arising from a rare period of no fire for about 25 years, allowing woody understory encroachment and higher tree density. Surface fire is rare, mixed fire and stand replacement fire are the normal pathways to stage retardation (back to late-seral open conditions) or secondary succession (back to early seral). Patch size likely in the 10's of acres. May include interior and/or coast live oak, and a variety of shrubs.

**Indicator Species\* and Canopy Position**

QUCH2  
QUDO  
QUGA4  
PISA2

**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 E 0%**

Late1 Closed

**Description**

**Indicator 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**

**Non-Fire Disturbances Modeled**

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

**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

**Historical Fire Size (acres)**

Avg:  
Min:  
Max:

**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.

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<b>Sources of Fire Regime Data</b>	<i>Avg FI</i>	<i>Min FI</i>	<i>Max FI</i>	<i>Probability</i>	<i>Percent of All Fires</i>
<input type="checkbox"/> Literature	<i>Replacement</i>	120		0.00833	8
<input type="checkbox"/> Local Data	<i>Mixed</i>	500		0.002	2
<input checked="" type="checkbox"/> Expert Estimate	<i>Surface</i>	10		0.1	91
	<i>All Fires</i>	9		0.11033	

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