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)

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
QUCH
QUGA
QUEN

General Model Sources

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

LANDFIRE Mapping Zones

3 6
4
5

Rapid AssessmentModel Zones

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

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 disturbances - biotic and abiotic - influence the life history of oaks. Under grazing, seedling/sapling growth

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

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

Dominant 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:

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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.

Dominant Species* and Canopy Position

QUDO
QUCH2
PISA2
QUGA4

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.

Dominant 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	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.

Dominant 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

Dominant Species* and Canopy Position

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	%
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

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.

	Avg FI	*Min FI*	*Max FI*	*Probability*	*Percent of All Fires*
Replacement	120			0.00833	8
Mixed	500			0.002	2
Surface	10			0.1	91
All Fires	9			0.11033	

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