

## 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)

**R#OAPI**                      **Oregon White Oak/Ponderosa Pine**

#### General Information

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**Vegetation Type**

Woodland

**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\***

QUGA  
 PIPO  
 AGSP  
 SYAL

**LANDFIRE Mapping Zones**

1	8
2	9
7	

**Geographic Range**

This type is typical at low elevations east of the Cascade Mountains of the Pacific Northwest. These woodlands occur east through the Columbia River Gorge and then span an area several hundred miles in a north-south axis.

They dominate areas between shrub-steppe and steppe communities at lower elevations and conifer-dominated woodlands or forest above.

**Biophysical Site Description**

Areas supporting Oregon White Oak are among the warmest and most arid sites supporting trees at the western edge of the Columbia Plateau. Most stands occur below 2000 feet in elevation but range between 1700 and 3000 feet.

Sites supporting this type range from steep, lower slopes to more moderate slopes on dry benches. The more mesic sites are river and stream terraces where this deciduous tree and more mesic shrub species (common snowberry, rose, bittercherry, and California hazel) represent vegetation seral to ponderosa pine or Douglas-fir forest.

Precipitation is generally less than 20 inches annually.

The substrates are usually very gravelly, stony coarse loams derived from basalt colluvium in the uplands while alluvial material, including basalt, is the primary regolith along rivers and streams.

**Vegetation Description**

On both upland sites and on river and stream terraces, Oregon white oak dominates the tree canopy layer. In late seral stands on the more mesic sites, conifers such as ponderosa pine and Douglas-fir will form a persistent emergent canopy over the oak.

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

The understory reflects the transitional nature of the woodlands. Species representative of the adjacent drier shrub-steppe and steppe communities are present as well as those more common in conifer associations upslope. Species present include: bitterbrush, bluebunch wheatgrass, sulfur lupine, yarrow, nine-leaf lomatium, Carey balsamroot, Sandberg bluegrass, showy phlox, fern-leaved lomatium, serviceberry, shiny-leaf spirea, Oregon grape, common snowberry, pinegrass, elk sedge, California hazel, rose, chokecherry, ocean-spray, and blue wildrye. In Oregon, the community may include Idaho fescue, bluebunch wheatgrass, prairie Junegrass, and squirreltail as dominant understory grass species.

### Disturbance Description

Historical fire frequency is between 5-30 years in this type. Fire intensities were probably low in open stands but increased in severity as woodland vegetation transitioned to a denser, closed canopy type along water courses. Vegetation is fire tolerant and therefore fire severity is low. The natural fire regime was a type I regime in the upland. In the more mesic river terraces and draws, fire frequency probably decreased with a fire interval of 50 or 60 years. With the more dense vegetation and the occurrence of fuel ladders, fire severity would become mixed. The fire regime may reflect a type III in this more mesic habitat.

Insects and disease may impact individual trees (either ponderosa pine or white oak) locally. Armillaria root rot, western pine beetle, western oak looper, western tent caterpillar, and the pine engraver have the greatest potential for damage.

### Adjacency or Identification Concerns

At lower elevations, these types butt against shrub steppe PNVGs and above they transition into ponderosa pine and mixed conifer PNVGs.

Cheatgrass is a major component of this type in the current landscape. The degree to which these understories depart from pre-settlement types is a measure of uncharacteristic vegetation and departure from historic conditions.

### Scale Description

Sources of Scale Data  Literature  Local Data  Expert Estimate

This woodland PNVG is usually a component in the low elevation landscape and creates a mosaic with shrub steppe, steppe, and forested communities. Fire usually occurs at a scale of magnitude larger than the patch size-- in the 1000's of acres size during extreme weather conditions.

### Issues/Problems

Growth rates of dominant species (QUGA4), dbhs, and MFI of PNVG estimated. The PNVG includes variation from arid to mesic sites supporting this vegetation type east of the Cascade Mountains in PNW.

Fire regime mixed between I and III possibly from arid to mesic ends of PNVG.

Cheatgrass and Kentucky bluegrass are non-native species. Cheatgrass, in particular, may impact fire behavior, frequency, and intensity in the current landscape

### Model Evolution and Comments

This model may reflect conditions in Washington state rather than including Oregon conditions. For example, stand-replacement fire was expected to average closer to 200-300 years in this type due to the need for extreme burning conditions or fuel conditions. Furthermore, the model does not explicitly account for grazing, bark beetles or other insects and disease which could have significant influence on the landscape proportions.

The vegetation classes in this model reflect a spatial partitioning of the PNVG rather than the more standard temporal modeling approach. The two closed canopy classes were modeled to include a mixed fire severity about every 60 to 70 years, but no mixed fire was included in the open classes. Since the closed classes resulted in less than ten percent of the landscape, the composite mixed fire frequency value appears

particularly low. VDDT software calculated the probability of mixed fire to be 0.0011 across the entire PNVG.

### **Succession Classes\*\***

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

**Class A 25%**

Early1 PostRep

**Description**

The early stage is the initial post-disturbance community dominated by white oak sprouts from coppice origin. Bunchgrasses and associated forbs dominate understory with bare ground and rock/gravel abundant in interspaces. Native herbivory may maintain oak sprouts in "shrub" form for extended period. Early stage includes oak sprouts or seedling/saplings growth to 4-6 inches dbh. Occasional sites with PIPO or PSME will have diameters up to 8 inches. [Succeeds to class C (mid/open) after about 50 years. Herbivory and surface fires maintain the stand in class A. About a tenth of this area is wet enough to succeed to Class B. (Alternate succession; 0.004.)]

**Dominant Species\* and Canopy Position**

QUGA4  
AGSP  
LUSU5  
BACA3

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** no data

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

	Min	Max
Cover	5 %	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 5%**

Mid1 Closed

**Description**

The mid-seral, closed stage occurs at the more mesic end of the environmental gradient and supports a dense canopy of oak and ponderosa pine and/or Douglas-fir. Oak diameter ranges from 6 to 12 inches d.b.h with crown closure approaching 70%. Ponderosa pine and Douglas-fir may be 8-20 inches dbh. Sod-forming grasses and shade-tolerant shrubs will be prominent on the majority of sites. Species from more arid sites may be remnants of earlier, more open post-fire communities. [Lasts up to 150 years in this class.]

**Dominant Species\* and Canopy Position**

QUGA4  
PIPO  
CARU  
AMAL2

**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:

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

Replacement fire about every 100 years; mixed fire opens the stand (to class C) about every 60-70 years.]

**Class C 20%**

**Mid1 Open**  
**Description**

The mid-seral, open stage occurs on arid slopes and benches and represents that portion of the environmental gradient where fire-tolerant communities develop as oak woodlands. Usually the dry site conditions limits tree density and canopy closure is relatively low (between 10-30%). Conifers may occur sporadically with low coverages. Oak diameter ranges from 6 to 10 inches dbh. Bunchgrasses and shade-intolerant shrubs, most notably antelope bitterbrush (PUTR2), will be prominent on the majority of sites. [Replacement fire is infrequent (200 year MFRI); Surface fire maintains it in class C (recurs about every 25 years on average.) Moist sites can fill in to late/closed conditions (probability = 0.004).]

**Dominant Species\* and Canopy Position**

QUGA4  
PUTR2  
AGSP  
LUSU5

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** no data

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

	<i>Min</i>	<i>Max</i>
<i>Cover</i>	10 %	30 %
<i>Height</i>	no data	no data
<i>Tree Size Class</i>	no data	

Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

**Class D 47%**

**Late1 Open**  
**Description**

The late seral, open stage is characterized by large, principally multi-stemmed white oaks in open stands with bunchgrass, forb, and shrub understories. These woodlands support crown closure between 10 and 30 %. Diameters range from 10-18 inches dbh with ages over 350 years for those individuals untouched by recent fire. Mature, large conifers may occur sporadically with low coverages. Bunchgrasses (AGSP and FEID) and shade-intolerant

**Dominant Species\* and Canopy Position**

QUGA4  
PUTR2  
AGSP  
BACA3

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** no data

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

	<i>Min</i>	<i>Max</i>
<i>Cover</i>	10 %	30 %
<i>Height</i>	no data	no data
<i>Tree Size Class</i>	no data	

Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

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shrubs, most notably antelope bitterbrush (PUTR2), will be prominent on the majority of sites. [Surface fires maintain it in class D (MFRI about 25 years). Replacement fire resets to class A (MFRI about 200 years.)

**Class E 3%**

Late I Closed

**Description**

This stage has mature overstory ponderosa pine and/or Douglas-fir as emergent over a lower canopy layer of white oak. The conifers have survived a few burn cycles and may show fire scars; dbhs are 21+ inches. Oregon white oak may reach its largest diameters in eastside ecosystems in these river and stream terraces attaining a dbh of 18-20 inches. Canopy closure is high (60-80%) with a dense understory dominated by sod-forming grasses and shrubs. [Mixed fire opens up the stand (MFRI about 60-70 years); replacement fire MFRI about 100 years.]

**Dominant Species\* and Canopy Position**

PIPO  
QUGA4  
SYAL  
COCO6

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** no data

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

	Min	Max
Cover	60 %	80 %
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

**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.

**Sources of Fire Regime Data**

- Literature
- Local Data
- Expert Estimate

	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
Replacement	125	100	300	0.008	16
Mixed	900	50	200	0.00111	2
Surface	25	5	30	0.04	81
All Fires	20			0.04911	

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