

10080

North Pacific Oak Woodland

BpS Model/Description Version: Aug. 2020

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Reviewers: Melissa Olson, Kori Blankenship

Vegetation Type

Forest and Woodland

Map Zones

1, 2, 3, 7

Geographic Range

This Biophysical Setting (BpS) is limited to the southern portions of the North Pacific region. It is found in the Georgia Basin, but occurs primarily in the Puget Trough and Willamette Valley, and trickles down into the Klamath ecoregion and northern California.

Biophysical Site Description

This BpS occurs in diverse climates, ranging from the cool, humid conditions near the coast to the hot, dry environment of inland valleys and foothill woodlands. This BpS can be found on steep slopes, but generally occurs on gentle topography, with slopes <30%. Elevations range from sea level to 3,500ft.

Soils are characteristically poor, drought prone, and moderately to excessively well drained. In the Georgia Basin and Puget Lowlands, this BpS is primarily found on dry sites, typically either shallow bedrock soils or deep, gravelly glacial outwash soils (Rocchio 2011a). In the Willamette Valley, soils are mesic but well drained (Rocchio 2011a). In southwest Oregon, soils are drought prone because they are either heavy clays, skeletal, or shallow. At the Umpqua, Oak Bench, and the Siskiyou sites, the soils are paralithic -- only 3-10in to parent rock. Roots can extract moisture from skeletal soils and from the parent rock. This capability gives oak enough of an advantage to survive.

Vegetation Description

Quercus garryana dominates a variable stand typically composed of widely spaced, large, individual trees with <35% canopy closure. Some stands in more protected settings could attain larger size and higher canopy closures. The understory is typically annual and perennial grasses and forbs. Other conspicuous tree species include *Pseudotsuga menziesii* and *Pinus ponderosa* (ponderosa pine is more common in southwest Oregon than in the Willamette Valley). *Acer macrophyllum* and *Umbellularia californica* are present in northern California, but in southwest Oregon and the Willamette Valley, they are generally not present. Associated shrub species

include *Toxicodendron diversilobum*, native *Rosa* spp., hazel, *Symphoricarpos albus*, and *Amelanchier alnifolia*. These shrubs are more often associated with *Pseudotsuga menziesii* potential. Also, in the northern extent of this type, Oregon grape is increasingly present. *Mahonia nervosa*, which indicates deeper soils, will not occur with this type, but *Mahonia aquifolium* or another species of tall Oregon grape is an indicator of rocky, shallow soils. Grass component includes *Festuca californica* and *F. idahoensis* (common in southwest Oregon), *F. idahoensis* ssp. *roemerii*, *Elymus glaucus*, *Melica*, *Danthonia californica*, and *Bromus carinatus* (if the area has not been overgrazed).

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
QUGA4	<i>Quercus garryana</i>	Oregon white oak
PSME	<i>Pseudotsuga menziesii</i>	Douglas-fir
TODI	<i>Toxicodendron diversilobum</i>	Pacific poison oak
AMAL2	<i>Amelanchier alnifolia</i>	Saskatoon serviceberry
SYAL	<i>Symphoricarpos albus</i>	Snowberry
FEIDR2	<i>Festuca idahoensis</i> subsp. <i>roemerii</i>	Roemer's fescue

Species names are from the NRCS PLANTS database. Check species codes at <http://plants.usda.gov>.

Disturbance Description

This BpS is strongly associated with a frequent (e.g., <10yrs), low-severity fire regime, even at sites where it is environmentally limited (Rocchio 2011a). Surface fires every 3-10yrs maintained an open savannah-like structure. Fires can be mixed severity, especially when closed canopy conditions or additional species such as conifers and shrubs are present. Native American burning was a significant factor in fire frequency of this type, but fire frequency may decrease significantly with a little distance from native settlements and valley bottoms. The interval ranges can double to 6-20yrs, depending on latitude, distance inland, and whether there is a blockage of the marine flow.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	294	3		
Moderate (Mixed)	38	26		
Low (Surface)	14	71		
All Fires	10	100		

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. Percent of all fires is the percent of all fires modeled in that severity class. Minimum and Maximum FIs show the relative range of fire intervals as estimated by model contributors, if known.

Scale Description

The distribution of this type is naturally patchy on the landscape controlled by soil and aspect, along with variable incidence of fire. The result is a typically smaller patch size: on the order of hundreds of acres.

Adjacency or Identification Concerns

This type is not found east of the Cascade crest. It transitions to the East Cascades Oak-Ponderosa Pine Forest and Woodland BpS near the Little White Salmon drainage near Augspur Mountain in Washington (Rocchio 2011b). Farther south, this BpS transitions to Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland on sites that can support conifers, or into Mediterranean California Mixed-Oak Woodland (Rocchio 2011a).

This BpS only has Oregon white oak and includes conifers whereas the Mediterranean California Mixed-Oak Woodland will have additional oak species and lacks the conifer component.

In the western portion of map zone (MZ) 3, these stands are likely surrounded by redwoods. In the eastern and southern portions of MZ03, and in MZ02 and MZ07, mixed-evergreen, Douglas-fir, ponderosa pine, or mixed-conifer types may be adjacent. This type is unlikely to be adjacent to tanoak unless it occurs on an unusual parent rock like the Umpqua Formation or another material that forms paralithic soils. Grand fir, white fir series, and Douglas-fir series may occur in the central portions of MZ02 and MZ07.

This BpS does not include oak types associated with wetlands or riparian settings. Those should be classified as North Pacific Lowland Riparian Forest and Shrubland (Rocchio 2011a).

Issues or Problems

Much of this system has been converted to agriculture or urban land uses. In the absence of frequent fire, in-growth of both conifer and shrub species often occurs. This type is heavily invaded by non-native annual grasses and forbs when overgrazed, severely burned, or otherwise compacted. Exotic species include *Cytisus scoparius*, *Prunus avium*, *Crataegus monogyna*, *Poa pratensis*, and others (Rocchio 2011a). The Ecological Integrity Assessment for this ecological system (Rocchio 2011a) provides more information about these and other current stressors.

Native Uncharacteristic Conditions

It would be uncharacteristic for post-replacement stands in this type to have canopy closure more than ~80% (a reviewer indicated that canopy >60% could be considered uncharacteristic). Likewise, maximum height >50m would suggest a different type than this oak woodland.

Comments

Melissa Olson and Kori Blankenship of The Nature Conservancy adjusted the description document during the 2016 review.

LANDFIRE National Review comments:

Thomas Atzet (jatzet@budget.net) was an additional reviewer for this model in MZ03, MZ02, and MZ07. Model review resulted in minor additions to the description. Review indicated that the replacement fire return interval, modeled as 300yrs, was too long and should be closer to 100yrs. A reviewer suggested that, as described, this model should be called a seral stage of either the PIPO or PSME potential type. Reviewers indicated they would have liked a five-box model similar to the class structure used for 021029.

Succession Classes

Mapping Rules

		Canopy Cover (%)
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Upper Layer Lifeform	Height (m)	0-10	11-20	21-30	31-40	41 - 50	51-60	61-70	71-80	81-90	91-100
Herb	0-0.5	A	A	A	A	A	A	A	A	A	A
Herb	0.5-1.0	A	A	A	A	A	A	A	A	A	A
Herb	>1.0	A	A	A	A	A	A	A	A	A	A
Shrub	0-0.5	A	A	A	A	A	A	A	A	A	A
Shrub	0.5-1.0	A	A	A	A	A	A	A	A	A	A
Shrub	1.0-3.0	A	A	A	A	A	A	A	A	A	A
Shrub	>3.0	A	A	A	A	A	A	A	A	A	A
Tree	0-5	A	A	A	A	A	A	A	A	A	A
Tree	5-10	A	A	A	A	A	A	A	A	A	A
Tree	10-25	C	C	C	C	B	B	B	B	B	B
Tree	25-50	C	C	C	C	B	B	B	B	B	B
Tree	>50	C	C	C	C	B	B	B	B	B	B

Succession class letters A-E are described in the Succession Class Description section. Some classes use a leafform distinction where a qualifier is added to the class letter: Brdl (broadleaf), Con (conifer), or Mix (mixed conifer and broadleaf). UN refers to uncharacteristic native or a combination of height and cover that would not be expected under the reference condition. NP refers to not possible or a combination of height and cover which is not physiologically possible for the species in the BpS.

Description

Class A 10 Early Development 1 - All Structures

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUGA4	<i>Quercus garryana</i>	Oregon white oak	Upper
TODI	<i>Toxicodendron diversilobum</i>	Pacific poison oak	Middle
FEIDR2	<i>Festuca idahoensis</i> subsp. <i>roemerii</i>	Roemer's fescue	Lower

Description

Bunchgrass/forb groundcover with resprouting oak and oak saplings following stand-replacement fire. Grass species vary geographically. *Festuca idahoensis* ssp. *roemerii*, *Elymus glaucus*, *Danthonia californica*, and *Bromus carinatus* are common in the Willamette Valley. *Festuca idahoensis* and *F. californica* are common in southwest Oregon. *Umbellularia californica* and *Acer macrophyllum* may be common in the understory in California but not in Oregon.

Maximum Tree Size Class

Pole 5-9" DBH

Class B 4 Mid Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUGA4	<i>Quercus garryana</i>	Oregon white oak	Upper
PSME	<i>Pseudotsuga menziesii</i>	Douglas-fir	Upper
FEIDR2	<i>Festuca idahoensis</i> subsp. <i>roemerii</i>	Roemer's fescue	Lower
TODI	<i>Toxicodendron diversilobum</i>	Pacific poison oak	Lower

Description

This stand type represents the portion of the landscape that has escaped fire for about 30yrs or so and has developed a closed canopy (>35% canopy cover of oak with some Douglas-fir). In the absence of fire, this stand will perpetuate and may eventually convert to a conifer forest. However, fire of any severity can occur in these stands. Shrub component may include *Amelanchier alnifolia*, *Symphoricarpos albus*, and *Mahonia aquifolium*. Conifers can exceed the height of the dominant oaks in the absence of fire.

Maximum Tree Size Class

Large 21-33" DBH

Class C 86 Mid Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUGA4	<i>Quercus garryana</i>	Oregon white oak	Upper
FEIDR2	<i>Festuca idahoensis</i> subsp. <i>roemerii</i>	Roemer's fescue	Lower
ELGL	<i>Elymus glaucus</i>	Blue wildrye	Lower

Description

The majority of the total landscape is in this open condition (<35% canopy cover oak savanna) with large-diameter, well-spaced trees. The understory is primarily composed of grasses, but species vary geographically. *Festuca idahoensis* ssp. *roemerii*, *Elymus glaucus*, *Danthonia californica*, and *Bromus carinatus* are common in the Willamette Valley; *Festuca idahoensis* and *F. californica* are common in southwest Oregon.

Maximum Tree Size Class

Large 21-33" DBH

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Mid1:OPN	29
Mid1:OPN	30	Mid1:OPN	999
Mid1:CLS	30	Mid1:CLS	999

Probabilistic Transitions

Disturbance Type	Disturbance occurs In	Moves vegetation to	Disturbance Probability	Return Interval (yrs)	Reset Age to New Class Start Age After Disturbance?	Years Since Last Disturbance
Alternative Succession	Early1:ALL	Mid1:CLS	1	1	Yes	28
Replacement Fire	Early1:ALL	Early1:ALL	0.005	200	Yes	0
Surface Fire	Early1:ALL	Early1:ALL	0.02	50	No	0
Mixed Fire	Early1:ALL	Early1:ALL	0.08	13	No	0
Alternative Succession	Mid1:OPN	Mid1:CLS	1	1	Yes	29
Replacement Fire	Mid1:OPN	Early1:ALL	0.0033	303	Yes	0
Mixed Fire	Mid1:OPN	Mid1:OPN	0.02	50	No	0
Surface Fire	Mid1:OPN	Mid1:OPN	0.08	13	No	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.0033	303	Yes	0
Insects or Disease	Mid1:CLS	Mid1:OPN	0.01	100	Yes	0
Surface Fire	Mid1:CLS	Mid1:OPN	0.05	20	Yes	0
Mixed Fire	Mid1:CLS	Mid1:OPN	0.05	20	Yes	0

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