

10370

North Pacific Maritime Dry-Mesic Douglas-Fir-Western Hemlock Forest

BpS Model/Description Version: Aug. 2020

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Reviewer: Miles Hemstrom, Pat Hochhalter, Jane Kertis, Amy Nathanson

Vegetation Type

Forest and Woodland

Map Zones

1, 2, 7

Geographic Range

This type occupies low montane elevations of the upper foothills of the Willamette Valley and in the eastern Coast Range and western Cascades in Oregon. In Washington, this Biophysical Setting (BpS) occurs in the rain shadow of the Olympic Mountains, in the Puget trough, and in lower montane elevations on the western side of the Cascade Mountains.

Biophysical Site Description

Soils are typically well drained. This type is most common on warm, southerly aspects up to 4,000ft in elevation.

Vegetation Description

Douglas-fir is the most common tree species found in this type. Western hemlock, western redcedar, grand fir, white pine, and chinkapin are seral associates of this type. Common understory herbs and shrubs include salal, dwarf Oregon grape, rhododendron, twinflower, vanilla leaf, and swordfern.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
PSME	<i>Pseudotsuga menziesii</i>	Douglas-fir
TSHE	<i>Tsuga heterophylla</i>	Western hemlock
THPL	<i>Thuja plicata</i>	Western red cedar

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

Disturbance Description

Fire is the major disturbance process. Mixed-severity fires are more common than stand-replacing events, occurring at 50-150yr frequencies. Stand-replacement fires that reset large landscapes occur at 250-500yr frequencies. This fire regime is largely responsible for the dominance of Douglas-fir in these landscapes.

Insects, pathogens, and windthrow also occur in this type at variable intervals, often interacting with drought and other extreme weather conditions. These disturbances affect smaller areas than fire. The primary insect disturbance is Douglas-fir beetle in Douglas-fir trees. Mortality as a result of this insect is usually in response to population build-up in down trees after wind events, especially if the wind event coincides with drier-than-normal summers. The wind effects would create patches of various size just like Douglas-fir beetle and laminated root rot, particularly in the late/mature classes.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	333	24	250	500
Moderate (Mixed)	104	76	50	150
Low (Surface)				
All Fires	79	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

Although fires are often large (100s-1,000s acres), fire severity patterns are quite variable, ranging from underburns to high-severity patches within single events. Wind, insects, and pathogens can create gaps of various sizes.

Adjacency or Identification Concerns

This type occurs differently in Oregon than its expression in Washington (map zone 1), due to increased probability of fire. The Douglas-fir Hemlock mesic/wet type occurs upslope and in moist topographic positions within this type's range.

Issues or Problems

Native Uncharacteristic Conditions

Comments

Miles Hemstrom, Pat Hochhalter, Jane Kertis, and Amy Nathanson reviewed this model during the 2016 review period and made minor changes to the description.

LANDFIRE National Comments:

Used COLA (Central Oregon Landscape Assessment) data (Hemstrom).

A reviewer suggested that wind could be included as a disturbance agent in the VDDT model (Classes D and E) because mortality resulting from insect infestations is usually in response to population build-up in down trees after wind events, especially if the wind event coincides with drier-than-normal summers.

Succession Classes

Mapping Rules

Upper Layer Lifeform	Height (m)	Canopy Cover (%)									
		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	B	B
Tree	5-10	A	C	C	C	C	C	B	B	B	B
Tree	10-25	A	C	C	C	C	C	B	B	B	B
Tree	25-50	A	D	D	D	D	D	E	E	E	E
Tree	>50	A	D	D	D	D	D	E	E	E	E

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 5 Early Development 1 - All Structures

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PTERI	Pteridium	Brackenfern	Lower
CHAN9	Chamerion angustifolium	Fireweed	Lower
PSME	Pseudotsuga menziesii	Douglas-fir	Upper
TSHE	Tsuga heterophylla	Western hemlock	Upper

Description

Post-stand-replacement community consisting of herbs and/or shrubs such as bracken fern, fireweed, ceanothus. Douglas-fir, western hemlock, and western redcedar seedlings may be present. Tree height averages 4ft.

Maximum Tree Size Class

Sapling >4.5ft; <5" DBH

Class B 17 Mid Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
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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
Replacement Fire	Early1:ALL	Early1:ALL	0.003	333	Yes	0
Replacement Fire	Mid1:OPN	Early1:ALL	0.003	333	Yes	0
Mixed Fire	Mid1:OPN	Mid1:OPN	0.01	100	No	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.003	333	Yes	0

Mixed Fire	Mid1:CLS	Mid1:OPN	0.005	200	Yes	0
Mixed Fire	Mid1:CLS	Mid1:CLS	0.005	200	No	0
Replacement Fire	Late1:OPN	Early1:ALL	0.003	333	Yes	0
Mixed Fire	Late1:OPN	Late1:OPN	0.01	100	No	0
Insects or Disease	Late1:CLS	Late1:OPN	0.001	1000	Yes	0
Replacement Fire	Late1:CLS	Early1:ALL	0.003	333	Yes	0
Mixed Fire	Late1:CLS	Late1:OPN	0.005	200	Yes	0
Mixed Fire	Late1:CLS	Late1:CLS	0.005	200	No	0

References

Agee, J. K. 1993. Fire Ecology of Pacific Northwest Forests. Washington, DC: Island Press.

Cissel, J.H. et al. 1998. A landscape plan based on historical fire regimes for a managed forest ecosystem: the Augusta Creek Study. USDA Forest Service, Pacific Northwest Research Station. Gen Tech. Rep PNW-GTR-422. 82 pp.

Franklin, J. F. and C.T. Dyrness. 1973. Natural vegetation of Oregon and Washington. Corvallis, OR: Oregon State University Press.

Garza, E.S. 1995. Fire history and fire regimes of East Humbug and Scorpion Creeks and their relation to the range of *Pinus lambertiana* (Dougl). MS thesis. Corvallis, OR: Oregon State University. 75 pp.

Hemstrom, M.A., S.E. Logan and W. Pavlat. 1987. Plant association and management guide, Willamette National Forest. Publication R6-Ecol-257b-1986. Portland, OR: USDA Forest Service, Pacific Northwest Region. 312 pp.

Henderson, J.A., D.H. Peter, R.D. Leshner and D.C. Shaw. 1989. Forested Plant Associations of the Olympic National Forest. USDA Forest Service, Pacific Northwest Region. R6 ECOL Technical Paper 001-88. 502 pp.

Lillybridge, T.R., B.L. Kovalchik, C.K. Williams and B.G. Smith. 1995. Field guide for forested plant associations of the Wenatchee National Forest. PNW-GTR-359. Portland, OR: USDA Forest Service, Pacific Northwest Research Station. 337 pp.

McCain, C. and N. Diaz 2002. Field Guide to the Forested Plant Associations of the Westside Central Cascades of Northwest Oregon. USDA FS PNW Tech Paper R6-NR-ECOL-TP-02-02.

McCain, C. and N. Diaz 2002. Field Guide to the Forested Plant Associations of the Northern Oregon Coast Range. USDA Forest Service PNW Tech Paper.

Morrison, P.H. and F.J. Swanson. 1990. Fire history and pattern in a Cascade Range landscape. PNW-GTR-254. USDA Forest Service, Pacific Northwest Research Station.

NatureServe. 2007. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA. Data current as of 10 February 2007.

Teensma, P.D. 1987. Fire history and fire regimes of the central western cascades of Oregon. PhD dissertation. University of Oregon.

Weisberg, P.J. 1998. Fire History, Fire Regimes and Development of Forest Structure in the Central Western Oregon Cascades. PhD dissertation. Oregon State University. 256 pp.