

10470

Northern Rocky Mountain Mesic Montane Mixed-Conifer Forest

BpS Model/Description Version: Aug. 2020

Modelers		Reviewers	
Mike Simpson	mlsimpson@fs.fed.us	Bruce Hostetler	bhostetler@fs.fed.us
Dave Swanson	dswanson@fs.fed.us	None	None
Dave Powell	dcpowell@fs.fed.us	None	None

Vegetation Type

Forest and Woodland

Map Zones

8, 9

Geographic Range

This type is modal in map zone (MZ) 10. It also occurs on stream and river canyons in the foothills of the Blues and of the northern Rockies. If this type occurs in MZ08, it would occur in the foothills of Yakima and Klickitat counties, especially on stream slopes.

Biophysical Site Description

This type occurs above the 25-in precipitation zone in the Blue Mountains and on a wide range of elevation. Soils are commonly deep ash (2-3ft) with high moisture content.

Vegetation Description

Includes ABGR, ABCO, and PSME, with various amounts of LAOC, PIPO, CADE3, PIEN, TABR, and PICO. ABCO hybridizes with ABGR throughout the Blue Mountains. Important understory associates are ASCA3, CLUN, LIBO2, VAME, ACGL, and TRCA3.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
ABGR	<i>Abies grandis</i>	Grand fir
PSME	<i>Pseudotsuga menziesii</i>	Douglas-fir
PIPO	<i>Pinus ponderosa</i>	Ponderosa pine
LAOC	<i>Larix occidentalis</i>	Western larch

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

Disturbance Description

Fire regime is mixed. Average fire return intervals range from approximately 45yrs at the warm, dry end of this biophysical setting (BpS) to approximately 100yrs at the transition to ABLA2 or TSME in the Wallowas and ABLA2 in the Blue Mountains. Insect and disease interactions are important in the mid and late closed conditions. Important insects and diseases include fir engraver, Douglas-fir beetle, Armillaria and other root diseases, stem decay caused by Indian paint fungus, and defoliating insects (western spruce budworm, Douglas-fir tussock moth, and larch casebearer). Root diseases occur in smaller patches (<100ha) and attack all age classes, whereas bark beetles cause mid-size patches (<1,000ha), especially older trees. Defoliators can cause patches in the same size range as replacement fire, primarily affecting younger trees.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	204	35		
Moderate (Mixed)	155	45		
Low (Surface)	355	20		
All Fires	71	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

Stand-replacement fire occurs in large events covering 1000- to 10,000-ac patches.

Adjacency or Identification Concerns

This BpS occurs below subalpine fir and above dry mixed conifer (pine dominated) in the Blue Mountains. Management in the 1960s and '70s planted more ponderosa pines than were originally present. These pines are now showing extensive snow and ice damage. There was likely more larch in the past than currently occurs, due either to high grading or to preferential removal for domestic uses. Also, blister rust has removed much of the white pine.

Issues or Problems

This mixed-conifer type occurs on the cool moist sites, whereas Northern Rocky Mountain Dry-Mesic Montane Mixed-Conifer Forest (1045) occurs on warm, dry sites.

Native Uncharacteristic Conditions

Comments

MZs 8 and 9 were combined during 2015 BpS Review.

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	A	A
Tree	5-10	C	C	C	C	C	B	B	B	B	B
Tree	10-25	C	C	C	C	C	B	B	B	B	B
Tree	25-50	D	D	D	D	D	E	E	E	E	E
Tree	>50	D	D	D	D	D	E	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	13	Early Development 1 - All Structures
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
CEVE	<i>Ceanothus velutinus</i>	Snowbrush ceanothus	Upper
ACGL	<i>Acer glabrum</i>	Rocky Mountain maple	Upper
SASC	<i>Salix scouleriana</i>	Scouler's willow	Upper
PHMA5	<i>Physocarpus malvaceus</i>	Mallow ninebark	Upper

Description

Shrub communities usually dominate following stand-replacement disturbance. Important species vary by ecoregion. ACGL, CEVE, and PHMA are important in the Blue Mountains. Some sites are limited, or shrub dominated (due to a reburn), and succeed to Class C. These shrub fields (CEVE, SASC) may recycle in Class A for extended periods of time.

Maximum Tree Size Class

Sapling >4.5ft; <5" DBH

Class B	41	Mid Development 1 - Closed
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PSME	<i>Pseudotsuga menziesii</i>	Douglas-fir	Upper
ABGR	<i>Abies grandis</i>	Grand fir	Upper
PIPO	<i>Pinus ponderosa</i>	Ponderosa pine	Upper
LAOC	<i>Larix occidentalis</i>	Western larch	Upper

Description

This class includes pole-size to small (5-20in) trees. These sites have prolific reproduction and close quickly. Class B is dominated by various mixtures of shade-tolerant and -intolerant conifers. Species vary by ecoregion. PSME and/or ABGR have higher cover than LAOC, PIPO, PIMO, or PICO.

Maximum Tree Size Class

Medium 9-21" DBH

Class C	12	Mid Development 1 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PIPO	Pinus ponderosa	Ponderosa pine	Upper
LAOC	Larix occidentalis	Western larch	Upper
PSME	Pseudotsuga menziesii	Douglas-fir	Mid-Upper
ABGR	Abies grandis	Grand fir	Mid-Upper

Description

Small amounts of this BpS do not immediately close or are created by disturbance events. Class C is pole-size to small (5-20in) trees; shade-intolerant species are dominant. PIPO and LAOC are more important components than PSME and ABGR or ABCO in this class.

Maximum Tree Size Class

Medium 9-21" DBH

Class D 11 Late Development 1 - Open

Upper Layer Lifeform: Tree

Upper Layer Canopy Cover: 0-50%

Upper Layer Canopy Height: Tree 25.1-50.1m+

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PSME	Pseudotsuga menziesii	Douglas-fir	Upper
PIPO	Pinus ponderosa	Ponderosa pine	Upper
LAOC	Larix occidentalis	Western larch	Upper
ABGR	Abies grandis	Grand fir	Mid-Upper

Description

Size of this class is large (>20in in DBH), but canopy closure is low and sites may be single- or multi-canopied. PSME, PIPO, and LAOC are more important than ABGR or ABCO in this class. Insect/disease, including bark beetles, attack the older trees. There is occasional wind/snow damage that maintains this class.

Maximum Tree Size Class

Very Large >33" DBH

Class E 23 Late Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
ABGR	Abies grandis	Grand fir	Upper
PSME	Pseudotsuga menziesii	Douglas-fir	Upper
PIPO	Pinus ponderosa	Ponderosa pine	Upper
LAOC	Larix occidentalis	Western larch	Upper

Description

Large trees dominate Class E. Stands typically have multiple canopies. Species composition may be mixed shade-tolerant species or include minor amounts of shade-intolerant pines or larch. Insects, including bark beetles, usually remove the older trees.

Maximum Tree Size Class

Very Large >33" DBH

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Mid1:CLS	29
Mid1:OPN	30	Late1:OPN	79
Mid1:CLS	30	Late1:CLS	99
Late1:OPN	80	Late1:OPN	999
Late1:CLS	100	Late1:CLS	998

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
Replacement Fire	Early1:ALL	Early1:ALL	0.002	500	Yes	0
Competition or Maintenance	Early1:ALL	Early1:ALL	0.0033	303	Yes	0
Alternative Succession	Early1:ALL	Mid1:OPN	0.007	143	Yes	0
Alternative Succession	Mid1:OPN	Mid1:CLS	1	1	Yes	40
Replacement Fire	Mid1:OPN	Early1:ALL	0.01	100	Yes	0
Mixed Fire	Mid1:OPN	Mid1:OPN	0.015	67	No	0
Surface Fire	Mid1:OPN	Mid1:OPN	0.02	50	No	0
Wind or Weather or Stress	Mid1:CLS	Mid1:OPN	0.001	1000	Yes	0
Insects or Disease	Mid1:CLS	Mid1:OPN	0.002	500	Yes	0
Mixed Fire	Mid1:CLS	Mid1:OPN	0.004	250	Yes	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.004	250	Yes	0
Alternative Succession	Late1:OPN	Late1:CLS	1	1	Yes	40
Wind or Weather or Stress	Late1:OPN	Late1:OPN	0.003	333	No	0
Replacement Fire	Late1:OPN	Early1:ALL	0.003	333	Yes	0
Surface Fire	Late1:OPN	Late1:OPN	0.005	200	No	0
Insects or Disease	Late1:OPN	Mid1:OPN	0.008	125	Yes	0

Mixed Fire	Late1:OPN	Late1:OPN	0.01	100	No	0
Insects or Disease	Late1:CLS	Late1:OPN	0.002	500	Yes	0
Wind or Weather or Stress	Late1:CLS	Mid1:OPN	0.003	333	Yes	0
Insects or Disease	Late1:CLS	Mid1:OPN	0.007	143	Yes	0
Replacement Fire	Late1:CLS	Early1:ALL	0.007	143	Yes	0
Mixed Fire	Late1:CLS	Late1:OPN	0.009	111	Yes	0

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