10520
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland

BpS Model/Description Version: Aug. 2020

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Vegetation Type
Forest and Woodland

Map Zone
15

Geographic Range
Rocky Mountains west into the ranges of the Great Basin.

Biophysical Site Description
Elevations range from 1,200-3,300m. Occurrences of this system are found on cooler and more mesic sites than Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland (1051). Such sites include lower and middle slopes of ravines; stream terraces; moist, concave topographic positions; and north- and east-facing slopes, which burn somewhat infrequently.

Vegetation Description
Pseudotsuga menziesii and *Abies concolor* are most common canopy dominants, but *Picea engelmannii*, *Picea pungens*, or *Pinus ponderosa* may be present. This system includes mixed-conifer/*Populus tremuloides* stands. A number of cold-deciduous shrub species can occur, including *Acer glabrum*, *Acer grandidentatum*, *Alnus incana*, *Betula occidentalis*, *Cornus sericea*, *Jamesia americana*, *Physocarpus malvaceus*, *Robinia neomexicana*, *Vaccinium membranaceum*, and *Vaccinium myrtillus*. Herbaceous species include *Bromus ciliatus*, *Carex geyeri*, *Carex rossii*, *Carex siccata*, *Muhlenbergia virescens*, *Pseudoroegneria spicata*, *Erigeron eximius*, *Fragaria virginiana*, *Luzula parviflora*, *Osmorhiza berteroi*, *Packera cardamine*, *Thalictrum occidentale*, and *Thalictrum fendleri*.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
PSME	*Pseudotsuga menziesii*	Douglas-fir
PICO	*Pinus contorta*	Lodgepole pine

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

Disturbance Description
Naturally occurring fires are of variable return intervals and are mostly light, erratic, and infrequent due to the cool, moist conditions. These ecological systems are characterized by a moderate-frequency, low- and mixed-severity fire regime. Some portions of these sites are transition zones to fire regimes characterized by more frequent fires or less frequent, higher severity fires. This vegetation is a transition between the frequent surface and mixed-severity

fires and the more stand-replacement regimes common in high-elevation fir and spruce ecosystems.

Surface fire and mixed-severity fire intervals were ~35-50yrs (Brown et al. 1994). Stand-replacement fires occurred at intervals of 120-400yrs+ (Crane 1986; Barrett 1988; Bradley 1992a and 1992b; Brown et al. 1994; Morgan et al. 1996). Likelihood of stand-replacement fires increased with canopy closure and fuel ladders caused by white fir growth; however, ground fires acted as replacement fires during early stand development.

Other disturbances included insect, disease, drought, and wind and ice damage. Fire was by far the dominant disturbance agent.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	188	18	120	400
Moderate (Mixed)	91	37		
Low (Surface)	73	45		
All Fires	33	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

This Biophysical Setting (BpS) occurs in patches ranging from 100s to 1,000s of acres.

Adjacency or Identification Concerns

This ecological system is often transitional between high-frequency, low- and moderate-severity fire regimes and low-frequency, high-severity fire regimes at higher elevations. Sites are dry/ steep montane with a variety of aspects (often northerly) and soil conditions.

Issues or Problems

Native Uncharacteristic Conditions

Comments

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	B	B	B	B	B	B	B
Tree	10-25	C	C	C	B	B	B	B	B	B	B
Tree	25-50	D	D	D	E	E	E	E	E	E	E
Tree	>50	D	D	D	E	E	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 **14** **Early Development 1 - All Structures**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PSME	Pseudotsuga menziesii	Douglas-fir	Upper
ABCO	Abies concolor	White fir	Upper

Description

Tree seedling-shrub-grass-forb.

Maximum Tree Size Class

Seedling <4.5ft

Class B **28** **Mid Development 1 - Closed**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PSME	Pseudotsuga menziesii	Douglas-fir	Upper
ABCO	Abies concolor	White fir	Upper

Description

Closed trees, sapling, large poles, grass, and scattered shrub, 75-100% Douglas-fir/white fir, some lodgepole pine, and spruces at higher elevations.

Maximum Tree Size Class

Medium 9-21" DBH

Class C **29** **Mid Development 1 - Open**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PSME	Pseudotsuga menziesii	Douglas-fir	Upper
ABCO	Abies concolor	White fir	Upper

Description
Open pole-sapling/grass and scattered shrubs; maybe 90% Douglas-fir.
Maximum Tree Size Class
Medium 9-21" DBH

Class D 18 Late Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PSME	Pseudotsuga menziesii	Douglas-fir	Upper
ABCO	Abies concolor	White fir	Upper
ABLA	Abies lasiocarpa	Subalpine fir	Mid-Upper

Description
Open large tree/grass and scattered shrubs; potentially 90% Douglas-fir.
Maximum Tree Size Class
Large 21-33" DBH

Class E 11 Late Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PSME	Pseudotsuga menziesii	Douglas-fir	Upper
ABCO	Abies concolor	White fir	Upper
ABLA	Abies lasiocarpa	Subalpine fir	Upper

Description
Closed medium to large trees, scattered shrubs; 60 to 100% Douglas-fir.
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:CLS	29
Mid1:CLS	30	Late1:CLS	99
Mid1:OPN	31	Late1:OPN	99
Late1:OPN	100	Late1:OPN	999
Late1:CLS	100	Late1: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

Wind or Weather or Stress	Early1:ALL	Early1:ALL	0.007	143	No	0
Replacement Fire	Early1:ALL	Early1:ALL	0.008	125	Yes	0
Mixed Fire	Early1:ALL	Early1:ALL	0.02	50	No	0
Alternative Succession	Mid1:OPN	Mid1:CLS	1	1	Yes	35
Wind or Weather or Stress	Mid1:OPN	Mid1:OPN	0.001	1000	No	0
Replacement Fire	Mid1:OPN	Early1:ALL	0.0025	400	Yes	0
Insects or Disease	Mid1:OPN	Mid1:OPN	0.01	100	No	0
Surface Fire	Mid1:OPN	Mid1:OPN	0.025	40	No	0
Wind or Weather or Stress	Mid1:CLS	Mid1:OPN	0.005	200	Yes	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.008	125	Yes	0
Insects or Disease	Mid1:CLS	Mid1:CLS	0.02	50	No	0
Mixed Fire	Mid1:CLS	Mid1:OPN	0.021	48	Yes	0
Alternative Succession	Late1:OPN	Late1:CLS	1	1	Yes	35
Wind or Weather or Stress	Late1:OPN	Late1:OPN	0.001	1000	No	0
Replacement Fire	Late1:OPN	Early1:ALL	0.0025	400	Yes	0
Insects or Disease	Late1:OPN	Late1:OPN	0.01	100	No	0
Surface Fire	Late1:OPN	Late1:OPN	0.025	40	No	0
Wind or Weather or Stress	Late1:CLS	Late1:OPN	0.005	200	Yes	0
Insects or Disease	Late1:CLS	Mid1:OPN	0.008	125	Yes	0
Replacement Fire	Late1:CLS	Early1:ALL	0.008	125	Yes	0
Insects or Disease	Late1:CLS	Late1:OPN	0.012	83	Yes	0
Mixed Fire	Late1:CLS	Late1:OPN	0.021	48	Yes	0
Surface Fire	Late1:CLS	Late1:CLS	0.021	48	No	0

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