

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

28

Geographic Range

Generally found in Arizona, New Mexico, and southwestern Colorado. This is a transition forest that occurs between the warm/dry mixed conifer and subalpine forest.

Biophysical Site Description

This Biophysical Setting (BpS) distribution is strongly driven by moisture gradients such as aspect and elevation. It is found on all aspects and slopes and a wide elevational band bounded by warm/dry mixed conifer at the low end and the subalpine forest on the upper end. In southwestern Colorado, cool/moist mixed conifer can be found from 2,125-3,180m (7,000-10,500ft). Soils are generally of sandstone and shale. The same moisture gradients will influence the cool/moist mixed conifer's distribution elsewhere, and it can be found in much lower and much higher elevations than those described here.

Vegetation Description

The mixed conifer is a transitional forest and therefore best thought of as a continuum that follows a moisture gradient driven by elevation and aspect. The cool, moist mixed conifer will have much less ponderosa pine than the warm/dry. However, ponderosa pine is found in small groups or isolated places usually in open areas, edges of meadows, and ridges. Ponderosa pine and Douglas-fir are often canopy dominants with a heavy white fir understory in the southern part of the BpS. The major tree species found in the cool/moist are Douglas-fir, ponderosa pine, blue spruce, and aspen. Other tree species encountered are Rocky Mountain juniper and southwestern white pine. Near riparian areas, wetlands, and drainages, blue spruce can be quite common. These stands are predominantly composed of white fir, aspen, and Douglas-fir.

Major understory species at the lower elevational range include Gambel oak, *Arcotstaphylos uva-ursi*, *Chimaphila umbellatum*, *Delphinium nelsoni*, *Mertensia* spp., *Carex gyeri*, etc. Upper-elevation understory species vary by region.

ABCO is not found north of Colorado Springs. PICO is rare in southern Colorado.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
ABCO	<i>Abies concolor</i>	White fir
POTR	<i>Poa tracyi</i>	Tracy's bluegrass
PSME	<i>Pseudotsuga menziesii</i>	Douglas-fir
PIPO	<i>Pinus ponderosa</i>	Ponderosa pine
PIFL2	<i>Pinus flexilis</i>	Limber pine
PIEN	<i>Picea engelmannii</i>	Engelmann spruce
PICO	<i>Pinus contorta</i>	Lodgepole pine
ABLA	<i>Abies lasiocarpa</i>	Subalpine fir

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

Disturbance Description

Fire is the primary disturbance, although insects can also play a major role. Fire frequencies are very variable and the cool/moist supports a mixed fire regime. Mixed-severity fires occurred every 6-60yrs. Lethal fires are usually at longer intervals, 100yrs+.

Insect and disease can act as thinning agents to larger-scale mortality agent but was not modeled.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	200	27	80	200
Moderate (Mixed)	143	37	35	250
Low (Surface)	151	36	10	200
All Fires	54	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

Large patch, 50-2,000ha.

Adjacency or Identification Concerns

Issues or Problems

Could not model the aspen and mixed conifer succession in one model because of box limitations.

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	C	B	B	B	B	B	B
Tree	10-25	C	C	C	C	B	B	B	B	B	B
Tree	25-50	D	D	D	D	E	E	E	E	E	E
Tree	>50	D	D	D	D	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 8 Early Development 1 - All Structures

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
POTR5	Populus tremuloides	Quaking aspen	All
ABCO	Abies concolor	White fir	All
PSME	Pseudotsuga menziesii	Douglas-fir	All
SYOR2	Symphoricarpos oreophilus	Mountain snowberry	All

Description

Post-lethal fire vegetation will depend on what was on site before it burned. Aspen may or may not be present, depending on what was present prior to the fire or other replacement disturbance. The site will start as grass/forb/shrub; aspen may also be present. Fire will maintain or prolong this stage. Conifers may be present. Any surviving conifers will be seed source. This class may look like a pure aspen stand from above.

Maximum Tree Size Class

Sapling >4.5ft; <5" DBH

Class B 38 Mid Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
POTR5	Populus tremuloides	Quaking aspen	Upper
PSME	Pseudotsuga menziesii	Douglas-fir	Mid-Upper
ABCO	Abies concolor	White fir	Mid-Upper
JUCO	Juncus compressus	Roundfruit rush	Lower

If present, aspen will be >10ft tall and very dense. Seedling/medium-sized conifers can be found mixed with aspen, if present. Understory may include mountain snowberry, common juniper, wild rose, and many species of grasses and forbs.

Medium 9-21" DBH

Class C	25	Mid Development 1 - Open
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Symbol	Scientific Name	Common Name	Canopy Position
PSME	<i>Pseudotsuga menziesii</i>	Douglas-fir	Upper
PIEN	<i>Picea engelmannii</i>	Engelmann spruce	Upper
ABCO	<i>Abies concolor</i>	White fir	Upper

If present, aspen will be >10ft tall and patchy. Seedling/medium-sized conifers can be found mixed with aspen, if present. Understory may include mountain snowberry, common juniper, wild rose, and many species of grasses and forbs. Canopy cover is low.

Medium 9-21" DBH

Class D	14	Late Development 1 - Open
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Symbol	Scientific Name	Common Name	Canopy Position
PSME	<i>Pseudotsuga menziesii</i>	Douglas-fir	Upper
PIEN	<i>Picea engelmannii</i>	Engelmann spruce	Upper
ABCO	<i>Abies concolor</i>	White fir	Upper

Aspen will be rare and mid-level. Understory will be sparse.

None

Class E	15	Late Development 1 - Closed
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Symbol	Scientific Name	Common Name	Canopy Position
PSME	<i>Pseudotsuga menziesii</i>	Douglas-fir	Upper

PIEN	Picea engelmannii	Engelmann spruce	Upper
ABCO	Abies concolor	White fir	Upper

Description

Dense conifer stand. Blue spruce and subalpine fir can come in. Aspen present in small amounts. Lots of dead and downed material. Understory possibly depauperate.

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	39
Mid1:OPN	40	Late1:OPN	149
Mid1:CLS	40	Late1:CLS	149
Late1:OPN	150	Late1:CLS	189
Late1:CLS	150	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
Alternative Succession	Early1:ALL	Mid1:CLS	1	1	Yes	20
Replacement Fire	Early1:ALL	Early1:ALL	0.005	200	Yes	0
Surface Fire	Early1:ALL	Mid1:OPN	0.02	50	Yes	0
Alternative Succession	Mid1:OPN	Mid1:CLS	1	1	Yes	40
Replacement Fire	Mid1:OPN	Early1:ALL	0.005	200	Yes	0
Surface Fire	Mid1:OPN	Mid1:OPN	0.013	77	No	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.005	200	Yes	0
Mixed Fire	Mid1:CLS	Mid1:OPN	0.01	100	Yes	0
Competition or Maintenance	Mid1:CLS	Mid1:CLS	0.012	83	No	0
Replacement Fire	Late1:OPN	Early1:ALL	0.005	200	Yes	0
Surface Fire	Late1:OPN	Late1:OPN	0.013	77	Yes	0
Replacement Fire	Late1:CLS	Early1:ALL	0.005	200	Yes	0
Mixed Fire	Late1:CLS	Late1:OPN	0.02	50	Yes	0

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