

10570

Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland

BpS Model/Description Version: Aug. 2020

Modelers		Reviewers	
Bruce Short	bshort@fs.fed.us	Vic Ecklund	vecklund@csu.org
None	None	Chuck Kostecka	kostecka@webaccess.net
None	None	None	None

Vegetation Type

Forest and Woodland

Map Zone

28

Geographic Range

Colorado south of I-70, into New Mexico. Bristlecone component drops out north of I-70. In Colorado above South Park, San Luis Valley floors. Extends onto southerly slopes of Mt. Evans and Pikes Peak, and along spine of Sangre de Cristos and east mid slopes of San Juans into New Mexico.

Biophysical Site Description

Elevation ranges from 2,475-3,050m (7,500-10,000ft), mid to upper slopes. The areas are typically in rain shadows and can often be considered dry, cold extents of tree cover.

Vegetation Description

Usually a mixed PIAR and PIFL type, with PIEN and PSME, and occasionally PIPO as sites moderate. Sparse understories, with grass (FEAR and FETH) or short shrubs (*Ribes* spp. and *Juniperus* spp.).

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
PIAR	<i>Pinus aristata</i>	Bristlecone pine
PIFL2	<i>Pinus flexilis</i>	Limber pine
FEAR2	<i>Festuca arizonica</i>	Arizona fescue
FETH	<i>Festuca thurberi</i>	Thurber's fescue
ARUV	<i>Arctostaphylos uva-ursi</i>	Kinnikinnick
CELE3	<i>Cercocarpus ledifolius</i>	Curl-leaf mountain mahogany
JUCO6	<i>Juniperus communis</i>	Common juniper
MARE11	<i>Mahonia repens</i>	Creeping barberry

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

Disturbance Description

This group contains some of the oldest trees in the region, with PIAR at 1,000yrs old or more and PIFL at 500yrs+. Understories are often sparse, with little to carry fires across the surface. Fire occurrence is low frequency and mixed severity. In the absence of wind, fires are likely

limited in extent (2ac or less). Stand-replacement fires are usually wind driven, especially in Classes C and D. Susceptible to bark beetles (especially PIFL), but generally is drought tolerant.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	486	29		
Moderate (Mixed)	197	71		
Low (Surface)				
All Fires	140	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. Stand-replacement fires of hundreds of acres have been experienced. Continuous bands of the group of 1000s of acres are present around large intermountain valleys (e.g., South Park in Colorado).

Adjacency or Identification Concerns

Probably synonymous with PIAR/FETH and PIAR/FEAR habitat types described by DeVelice et al. (1986). Also similar to Great Basin Pine group present in Utah, Nevada, and Idaho.

Issues or Problems

B Wilmore suggests fire regime 4 or 5.

Native Uncharacteristic Conditions

Canopy cover >60% can be considered uncharacteristic for this woodland biophysical setting.

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	UN	UN	UN	UN
Tree	5-10	A	B	B	B	B	B	UN	UN	UN	UN
Tree	10-25	A	C	C	C	C	C	UN	UN	UN	UN
Tree	25-50	A	C	C	C	C	C	UN	UN	UN	UN
Tree	>50	A	C	C	C	C	C	UN	UN	UN	UN

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

Description

Early Development 1 - All Structures

Indicator Species

Description

Class B

35

Mid Development 1 - Open

Indicator Species

Description

Class C	46
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Late Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PIAR	<i>Pinus aristata</i>	Bristlecone pine	Upper
PIFL2	<i>Pinus flexilis</i>	Limber pine	Upper
FEAR2	<i>Festuca arizonica</i>	Arizona fescue	Lower
RIMO2	<i>Ribes montigenum</i>	Gooseberry currant	Lower

Description

Open woodland, generally with <40% crown cover of mixed diameter. Sparse ground cover of grasses and low shrubs.

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Mid1:OPN	99
Mid1:OPN	100	Late1:OPN	199
Late1:OPN	200	Late1:OPN	949

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
Mixed Fire	Early1:ALL	Early1:ALL	0.005	200	No	0
Wind or Weather or Stress	Early1:ALL	Early1:ALL	0.01	100	No	0
Replacement Fire	Mid1:OPN	Early1:ALL	0.002	500	Yes	0
Mixed Fire	Mid1:OPN	Mid1:OPN	0.005	200	No	0
Replacement Fire	Late1:OPN	Early1:ALL	0.002	500	Yes	0
Mixed Fire	Late1:OPN	Mid1:OPN	0.005	200	Yes	0

References

Baker, W. L. 1992. Structure, disturbance, and change in the bristlecone pine forests of Colorado, U.S.A. *Arctic and Alpine Research* 24: 17-26.

Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, K. Snow and J. Teague. 2003. *Ecological systems of the United States: A working classification of U.S. terrestrial systems*. NatureServe, Arlington, VA.

DeVelice, R.L., J.A. Ludwig, W.A. Moir and F. Ronco. 1986. *A Classification of Forest Habitat Types of Northern New Mexico and Southern Colorado*. USDA-FS General Technical Report RM-131. Rocky Mountain Forest and Range Experiment Station, Ft Collins, CO. 59 pp.

Donnegan, J.A., T.T. Veblen and J.S. Sibold. 2001. Climatic and human influences on fire history in Pike National Forest, central Colorado. *Canadian Journal of Forest Research* 31: 1526-1539.

Howard, J.L. 2004. *Pinus aristata*. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: www.fs.fed.us/database/feis [29 April 2005].

Knight, D.H. 1994. Mountains and plains: Ecology of Wyoming landscapes. Yale University Press, New Haven, MA. 338 pp.

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

Ranne, B.M., W.L. Baker, T. Andrews and M.G. Ryan. 1997. Natural variability of vegetation, soils, and physiography in the bristlecone pine forests of the Rocky Mountains. *Great Basin Naturalist* 57(1): 21-37.

NatureServe. 2004. International Ecological Classification Standard: Terrestrial Ecological Classifications, NatureServe Central Databases. Arlington, VA. U.S.A. Data current as of November 4, 2004.