

10520

Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland

BpS Model/Description Version: Aug. 2020

Modelers		Reviewers	
Julia H. Richardson	jhrichardson@fs.fed.us	Louis Provencher	lprovencher@tnc.org
None	None	None	None
None	None	None	None

Vegetation Type

Forest and Woodland

Map Zone

17

Geographic Range

Rocky Mountains west into the ranges of the Great Basin.

Biophysical Site Description

Elevations range from 1,200-3,300m (4,000-11,000ft). 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

Abies concolor is most common canopy dominant with *Picea engelmannii*, *Pinus flexilis*, and *Pinus longeava*. *Pseudotsuga menziesii* will be rare and restricted to northern Nevada and Utah. A number of cold-deciduous shrub species can occur, including *Acer glabrum*, *Alnus incana*, *Betula occidentalis*, *Cornus sericea*, *Jamesia americana*, *Physocarpus malvaceus*, *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
ABCO	<i>Abies concolor</i>	White fir
PIFL2	<i>Pinus flexilis</i>	Limber pine
ABLA	<i>Abies lasiocarpa</i>	Subalpine fir
PICO	<i>Pinus contorta</i>	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 moderate- to high-frequency, low- and mixed-severity fire regimes, but some portions of these

sites are transition zones to moderate-frequency, high-severity fire regimes. 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 created 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	183	18	120	400
Moderate (Mixed)	90	36		
Low (Surface)	72	46		
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. In map zones 12 and 17, BpS 1051 is uncommon and should be included in BpS 1052.

This system includes mixed-conifer/*Populus tremuloides* (aspen) stands. If aspen is present and soils show a clear organic layer, BpS 1061 Intermountain Basins Aspen-Mixed Conifer Forest and Woodland should be used.

Issues or Problems

Native Uncharacteristic Conditions

Comments

Succession Classes

Mapping Rules

		Canopy Cover (%)
--	--	------------------

Upper Layer Lifeform	Height (m)	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 15 Early Development 1 - All Structures

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
ABCO	Abies concolor	White fir	Upper
PICO	Pinus contorta	Lodgepole pine	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
ABCO	Abies concolor	White fir	Upper
PICO	Pinus contorta	Lodgepole pine	Upper
PIFL2	Pinus flexilis	Limber pine	Upper

Description

This class includes closed trees, sapling, large poles, grass, and scattered shrubs. Composition is 75-100% white fir, some lodgepole pine, and spruces at higher elevations.

Medium 9-21" DBH

Mid Development 1 - Open

Symbol	Scientific Name	Common Name	Canopy Position
ABCO	<i>Abies concolor</i>	White fir	Upper
PICO	<i>Pinus contorta</i>	Lodgepole pine	Upper
ABLA	<i>Abies lasiocarpa</i>	Subalpine fir	Upper

Open pole-sapling/grass and scattered shrubs; maybe 90% white fir.

Medium 9-21" DBH

Late Development 1 - Open

Symbol	Scientific Name	Common Name	Canopy Position
ABCO	<i>Abies concolor</i>	White fir	Upper
PIFL2	<i>Pinus flexilis</i>	Limber pine	Upper
ABLA	<i>Abies lasiocarpa</i>	Subalpine fir	Mid-Upper

Open large tree/grass and scattered shrubs; potentially 90% white fir.

Large 21-33" DBH

Late Development 1 - Closed

Symbol	Scientific Name	Common Name	Canopy Position
ABCO	<i>Abies concolor</i>	White fir	Upper
ABLA	<i>Abies lasiocarpa</i>	Subalpine fir	Upper
PIFL2	<i>Pinus flexilis</i>	Limber pine	Upper

Closed medium to large trees, scattered shrubs; 60-100% white 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

References

Barrett, S.W. 1988. Fire Suppression effects on Forest Succession within a Central Idaho Wilderness. *Western J. of Applied Forestry*. 3(3):76-80.

Barrett, S.W. 1994. Fire Regimes on the Caribou National Forest, Southern Idaho. Final Report – Contract No. 53-02S2-3-05071. September 1994.

Barrett, S.W. 2004. Altered fire intervals and fire cycles in the northern Rockies. *Fire Management Today* 64(2): 25-29.

Barrett, S.W. 2004. Fire regimes in the northern Rockies. *Fire Management Today* 64(2): 32-38.

Bradley, A.F., W.C. Fischer and N.V. Noste. 1992. Fire Ecology of the Forest Habitat Types of Eastern Idaho and Western Wyoming. Intermountain Research Station, Ogden UT 84401. GTR-INT-290.

Bradley, A.F., N.V. Noste and W.C. Fischer. 1992. Fire Ecology of the Forests and Woodland in Utah. Intermountain Research Station, Ogden UT 84401. GTR-INT-287.

Brown, J.K., S.F. Arno, S.W. Barrett and J.P. Menakis. 1994. Comparing the Prescribed Natural Fire Program with Presettlement Fires in the Selway-Bitterroot Wilderness. *Int. J. Wildland Fire* 4(3): 157-168.

Crane, M.F. 1986. Fire Ecology of the Forest Habitat Types of Central Idaho. Intermountain Research Station, Ogden UT 84401. GTR-INT-218.

Morgan, P., S.C. Bunting, A.E. Black, T. Merrill and S. Barrett. 1996. Fire Regimes in the Interior Columbia River Basin: Past and Present. Final Report For RJVA-INT-94913: Course-scale classification and mapping of disturbance regimes in the Columbia River Basin. Submitted to: Intermountain Fire Science Lab., Intermountain Research Station, Missoula, Montana, USDA Forest Service.

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

Steele, R., R.D. Pfister, R.A. Ryker and J.A. Kittams. 1981. Forest Habitat Types of Central Idaho. USDA For. Serv. Tech. Rep. INT-114, 138 pp. Intermt. For. And Range Exp. Stn., Ogden, Utah 84401.

Swetnam, T.W., B.E. Wickman, H.G. Paul and C.H. Baisan. 1995. Historical patterns of western spruce budworm and Douglas-fir tussock moth outbreaks in the northern Blue Mountains, Oregon, since A.D. 1700. USDA Forest Service. Pacific Northwest Research Station. Research Paper PNW-RP-484. 27 pp.