10570

Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Forest and Woodland

Map Zone

29

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.

This system is not common for map zone (MZ) 29. It might only be found in the higher elevations of the Bighorns, and possibly some of the isolated ranges in central Wyoming (the Ferris Mountains). In MZ29, it would occur on few locations around Laramie Peak (10,274ft) and maybe in the Bighorns. This includes a very small number of acres within the MZ.

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. May also occur where soils are extremely rocky and on windswept ridges where snow is blown away.

In MZ29, in the Bighorns, limber pine is located almost exclusively on sedimentary substrates. In the Laramie Peak area, it occurs on Sherman granite. It is at high elevations, approximately 10,000ft.

Vegetation Description

Usually a mixed PIAR (not in MZ29) 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.). Arizona fescue doesn’t occur in MZ29. *Festuca idahoensis* does. Thurber’s fescue also doesn’t occur in MZ29.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| PIAR | *Pinus aristata* | Bristlecone pine |
| PIFL2 | *Pinus flexilis* | Limber pine |
| FEID | *Festuca idahoensis* | Idaho fescue |
| ARUV | *Arctostaphylos uva-ursi* | Kinnikinnick |
| CELE3 | *Cercocarpus ledifolius* | Curl-leaf mountain mahogany |
| JUCO6 | *Juniperus communis* | Common juniper |
| MARE11 | *Mahonia repens* | 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 of 1,000yrs or more and PIFL of 500-1,000yrs+. Understories are often sparse, with little to carry fires across the surface. Fire occurrence is low frequency and mixed severity. Fire frequency, in fact, can be low enough to be almost nonexistent because PIFL has no fire resistance and somehow it gets to be very old on many of these sites. In the absence of wind, fires are likely limited in extent (2ac or less).

Peer review of R3BCLP disagreed with the fire frequency of the original Rapid Assessment (RA) R3BCLPsw model (mean fire return interval [MFRI], 83yrs) and thought a longer MFRI should be used, putting the biophysical setting (BpS) into fire regime group IV or V. Surface fires were reduced from a 200-yr MFRI to a 1,000-yr MFRI. The MZ28 model had a replacement interval of 500yrs (as did the RA model), and a mixed-severity interval of 200yrs, for an overall FRI of 143yrs, which was shorter than the FRI of lower elevation BpS 1049 and was in contrast to the description presented earlier in this document. Therefore, the regional lead decided to change the model for MZ29 to match the RA model’s FRI of 1000yrs for low- severity/surface fire, instead of the 200-yr mixed-severity FRI.

Susceptible to bark beetles (especially PIFL), but is generally drought tolerant. Affected by white pine blister rust – an uncharacteristic condition that results in more dead trees and fuel than is characteristic in MZ29. This was not modeled, however.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 495 | 67 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) | 990 | 33 |  |  |
| All Fires | 330 | 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 thousands of acres are present around large inter-mountain 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.

BpS 1057 Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland might be difficult to distinguish from 1049 Rocky Mountain Foothill Limber Pine-Juniper Woodland. The difference is mainly that 1057 is higher, subalpine elevation. All the other limber pine should probably be classified to 1049.

Adjacent to lodgepole pine and spruce-fir types in MZ29. Can also be adjacent to alpine/subalpine grass types.

Issues or Problems

Native Uncharacteristic Conditions

Canopy cover >60% is considered uncharacteristic for this woodland BpS, although that cover occurs occasionally in MZ29.

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 | B | B | B | B | B | B | UN | UN | UN | UN |
| Tree | 10-25 | C | C | C | C | C | C | UN | UN | UN | UN |
| Tree | 25-50 | C | C | C | C | C | C | UN | UN | UN | UN |
| Tree | >50 | C | 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 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 18 Early Development 1 - All Structures

Upper Layer Lifeform: Tree

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIFL2 | Pinus flexilis | Limber pine | All |
| FEID | Festuca idahoensis | Idaho fescue | All |

Description

Bare ground and talus with sparse ground cover of forbs, grasses, and low shrubs. Occasional old survivors may be present.

Class B 28 Mid Development 1 - Open

Upper Layer Lifeform: Tree

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIFL2 | Pinus flexilis | Limber pine | Upper |
| FEID | Festuca idahoensis | Idaho fescue | Upper |

Description

Open woodland, generally with <40% crown closure of seedlings, saplings, and survivors. Not seen as a closed stand.

Class C 54 Late Development 1 - Open

Upper Layer Lifeform: Tree

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIFL2 | Pinus flexilis | Limber pine | Upper |
| FEID | Festuca idahoensis | Idaho fescue | Upper |
| RIBES | Ribes | 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 | 249 |
| Late1:OPN | 250 | 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** |
| Surface Fire | Early1:ALL | Early1:ALL | 0.001 | 1000 | No | 0 |
| Replacement Fire | Early1:ALL | Early1:ALL | 0.002 | 500 | Yes | 0 |
| Wind or Weather or Stress | Early1:ALL | Early1:ALL | 0.01 | 100 | No | 0 |
| Surface Fire | Mid1:OPN | Mid1:OPN | 0.001 | 1000 | No | 0 |
| Replacement Fire | Mid1:OPN | Early1:ALL | 0.002 | 500 | Yes | 0 |
| Surface Fire | Late1:OPN | Mid1:OPN | 0.001 | 1000 | Yes | 0 |
| Replacement Fire | Late1:OPN | Early1:ALL | 0.002 | 500 | Yes | 0 |

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