10550

Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland

BpS Model/Description Version: Aug. 2020 2014

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Vegetation Type

Forest and Woodland

Map Zone

17

Geographic Range

Subalpine forests the Great Basin (eastern California, Nevada, and Utah).

Biophysical Site Description

Dry-mesic fir forest are the matrix forests of the subalpine zone, with elevations ranging from 2,100-3,355m (7,000-11,000ft). Sites within this system are cold year-round, and precipitation is predominantly in the form of snow, which may persist until late summer. Snowpacks are deep and late-lying, and summers are cool. Frost is possible almost all summer and may be common in restricted topographic basins and benches.

Vegetation Description

Subalpine fir forests comprise a substantial part of this subalpine forest, accompanied by *Pinus albicualis* and/or *Pinus flexilis*. The amount of *Pinus* in stands (and species occurrence) depends on moisture limitations, some stands can be quite droughty. *Populus tremuloides* stands are common on early seral moist sites. *Abies lasiocarpus* increases in importance or replaces *Picea engelmannii* with increasing distance from the regions of Montana and Idaho where maritime air masses influence the climate. Fire is an important disturbance factor, but fire regimes have a long return interval and so are often stand-replacing. *Abies lasiocarpus* can rapidly recolonize and dominate burned sites, or can succeed other species such as *Pinus albicaulis, P. flexilis or Populus tremuloides*. Old growth characteristics in *Abies lasiocarpa* forests will include treefall and windthrow gaps in the canopy, with large downed logs, rotting woody material, tree seedling establishment on logs or on mineral soils unearthed in root balls, and snags.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| ABLA | *Abies lasiocarpa* | Subalpine fir |
| PIAL | *Pinus albicaulis* | Whitebark pine |
| PIFL2 | *Pinus flexilis* | Limber pine |

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

Disturbance Description

Primarily long-interval (150-200yrs) stand replacement fires, with mixed severity fire (1,000yrs) occurring in open conditions. Disturbances also include insect/disease every 100-150yrs, and windthrow events that thin younger closed stands.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 177 | 99 |  |  |
| Moderate (Mixed) | 16077 | 1 | 1000 | 1000 |
| Low (Surface) |  |  |  |  |
| All Fires | 175 | 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

Patch sizes vary but are mostly in the 10s and 100s of acres. There may be frequent small disturbances in the 10s of acres or less.

Adjacency or Identification Concerns

It is important not to confuse adjacent mountain sagebrush systems (Biophysical Setting [BpS] 1126 Inter-Mountain Basins Montane Sagebrush Steppe) with early development stages of this system. BpS 1156 may be imbedded in BpS 1055.

If aspen is present in large patches or if conifers are not coming in after ~30yrs, the BpS is probably misclassified and one of the Aspen types should be examined (BpS 1011 or 1061).

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 | C | B | B | B | B | B | B |
| Tree | 10-25 | C | C | C | C | D | D | D | D | D | D |
| Tree | 25-50 | C | C | C | C | D | D | D | D | D | D |
| Tree | >50 | C | C | C | C | D | D | D | D | D | D |

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 34 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| FEID | Festuca idahoensis | Idaho fescue | Lower |
| PSSP | Psilostrophe sparsiflora | Greenstem paperflower | Lower |
| ABLA | Abies lasiocarpa | Subalpine fir | Upper |
| PINUS | Pinus | Pine | Upper |

Description

Early succession after moderately long to long interval replacement fires. Within 40yrs, conifers will replace herbaceous vegetation and shrubs. Occasionally, a lack of seed source of conifer may maintain this condition (modeled as competition/maintenance).

*Maximum Tree Size Class*  
Sapling >4.5ft; <5"DBH

Class B 24 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ABLA | Abies lasiocarpa | Subalpine fir | Upper |
| PIAL | Pinus albicaulis | Whitebark pine | Upper |
| PIFL2 | Pinus flexilis | Limber pine | Upper |

Description

Shade tolerant and mixed conifer saplings to poles. Fir dominates, some pine is present, but showing signs of light competition stress. Canopy is dense. Dog-hair conditions in this state may maintain the mid-development closed condition.

*Maximum Tree Size Class*  
Medium 9-21"DBH

Class C 6 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ABLA | Abies lasiocarpa | Subalpine fir | Upper |
| PIAL | Pinus albicaulis | Whitebark pine | Middle |
| PIFL2 | Pinus flexilis | Limber pine | Middle |

Description

Primarily moderately tolerant saplings to poles (1-6.9in DBH) and <50% canopy cover of fir and pine that is intermediate or suppressed.

*Maximum Tree Size Class*  
Medium 9-21"DBH

Class D 36 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ABLA | Abies lasiocarpa | Subalpine fir | Upper |
| PIAL | Pinus albicaulis | Whitebark pine | Low-Mid |
| PIFL2 | Pinus flexilis | Limber pine | Low-Mid |

Description

Pole and larger diameter moderately to shade tolerant conifer species, in moderate to large size patches, all aspects. Fir dominates, pine is intermediate or suppressed/dying. This class will self-perpetuate if no disturbances cause a transition.

*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 | 39 |
| Mid1:OPN | 40 | Late1:CLS | 79 |
| Mid1:CLS | 40 | Late1:CLS | 79 |
| Late1:CLS | 80 | 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** |
| Competition or Maintenance | Early1:ALL | Early1:ALL | 0.002 | 500 | No | 0 |
| Replacement Fire | Early1:ALL | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Mixed Fire | Mid1:OPN | Mid1:OPN | 0.001 | 1000 | No | 0 |
| Replacement Fire | Mid1:OPN | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Competition or Maintenance | Mid1:CLS | Mid1:CLS | 0.001 | 1000 | No | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Insects or Disease | Mid1:CLS | Mid1:OPN | 0.007 | 143 | Yes | 0 |
| Wind or Weather or Stress | Late1:CLS | Late1:CLS | 0.001 | 1000 | No | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.007 | 143 | Yes | 0 |
| Insects or Disease | Late1:CLS | Early1:ALL | 0.01 | 100 | Yes | 0 |

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