

## 10200

### Inter-Mountain Basins Subalpine Limber-Bristlecone Pine Woodland

BpS Model/Description Version: Aug. 2020

| Modelers            |                        | Reviewers        |                     |
|---------------------|------------------------|------------------|---------------------|
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#### Vegetation Type

Forest and Woodland

#### Map Zones

6, 9, 12, 17

#### Geographic Range

Dry wind-swept ridges and exposed upper elevations of Nevada, Utah, southern Idaho, and eastern California.

#### Biophysical Site Description

Elevation ranges from 8,000-11,500ft on mid- to upper slopes. The areas are typically in rain shadows and are the dry and cold extent of tree cover. Stands occur on thin, stony soils, high windswept ridges, and open slopes with minimal ground cover.

#### Vegetation Description

*Pinus longaeva*, *Pinus flexilis*, and *Pinus albicaulis* can exist separately or as mixed stands. In Nevada, *Picea engelmannii* and *Pseudotsuga menziesii* occur incidentally with *Pinus longaeva*. Sparse understories of forbs, grass, and short shrubs form an understory. Seed dispersal of limber and bristlecone pines highly dependent on seed-caching birds.

#### BpS Dominant and Indicator Species

| Symbol | Scientific Name         | Common Name                  |
|--------|-------------------------|------------------------------|
| PILO   | <i>Pinus longaeva</i>   | Great basin bristlecone pine |
| PIFL2  | <i>Pinus flexilis</i>   | Limber pine                  |
| PIAL   | <i>Pinus albicaulis</i> | Whitebark pine               |

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 area, with *Pinus longaeva* 1,000yrs old or more and *Pinus flexilis* ages of 500yrs+. Understories are often sparse, with little to carry fires across the surface. Fire occurrence is typically low frequency and surface fires. In the absence of wind, fires are likely limited in extent (2ac or less). Stand replacement fires are usually wind-driven, especially in older stands (Class C). Susceptible to bark beetles (especially *Pinus flexilis*) but generally drought-tolerant.

#### Fire Frequency

| Severity         | Avg FI | Percent of All Fires | Min FI | Max FI |
|------------------|--------|----------------------|--------|--------|
| Replacement      | 497    | 29                   |        |        |
| Moderate (Mixed) |        |                      |        |        |

|               |     |     |  |  |
|---------------|-----|-----|--|--|
| Low (Surface) | 200 | 71  |  |  |
| All Fires     | 143 | 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

Stands vary from 10s to 100s of acres in size. Stand replacement fires of 1/10th acres to 100ac have been experienced.

### Adjacency or Identification Concerns

A new and uncharacteristic disturbance is the potential for the introduction of white pine blister rust in both of these species. Blister rust is not yet occurring in the Utah High Plateau and western Great Basin. Note: blister rust has been found in Nevada in PIAL. Surveys in 2004 in Nevada bristlecone found no blister rust in PILO.

### Issues or Problems

Similar to model in Colorado and southwest model, although the bristlecone species is *Pinus aristata* there.

### Native Uncharacteristic Conditions

### Comments

Map zones (MZs) 06, 09, 12, and 17 were combined during 2015 Biophysical Setting (BpS) Review because the comments and LANDFIRE review indicated that the models were duplicate with only minor differences in the S-class mapping rules. S-class rules from MZ06 were used in the combined description because they used LANDFIRE class breaks and were mutually exclusive.

## 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     | UN    | UN    | UN    | UN    | UN     |
| Herb                 | 0.5-1.0    | A                | A     | A     | A     | A     | UN    | UN    | UN    | UN    | UN     |
| Herb                 | >1.0       | A                | A     | A     | A     | A     | UN    | UN    | UN    | UN    | UN     |
| Shrub                | 0-0.5      | A                | A     | A     | A     | A     | UN    | UN    | UN    | UN    | UN     |
| Shrub                | 0.5-1.0    | A                | A     | A     | A     | A     | UN    | UN    | UN    | UN    | UN     |
| Shrub                | 1.0-3.0    | A                | A     | A     | A     | A     | UN    | UN    | UN    | UN    | UN     |
| Shrub                | >3.0       | A                | A     | A     | A     | A     | UN    | UN    | UN    | UN    | UN     |
| Tree                 | 0-5        | A                | A     | B     | B     | B     | UN    | UN    | UN    | UN    | UN     |
| Tree                 | 5-10       | A                | B     | B     | B     | B     | UN    | UN    | UN    | UN    | UN     |
| Tree                 | 10-25      | A                | C     | C     | C     | C     | UN    | UN    | UN    | UN    | UN     |
| Tree                 | 25-50      | A                | C     | C     | C     | C     | UN    | UN    | UN    | UN    | UN     |
| Tree                 | >50        | A                | C     | C     | C     | C     | UN    | 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

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|                |           |                                             |
|----------------|-----------|---------------------------------------------|
| <b>Class A</b> | <b>19</b> | <b>Early Development 1 - All Structures</b> |
|----------------|-----------|---------------------------------------------|

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### Indicator Species

| Symbol | Scientific Name | Common Name                  | Canopy Position |
|--------|-----------------|------------------------------|-----------------|
| PILO   | Pinus longaeva  | Great basin bristlecone pine | All             |
| PIFL2  | Pinus flexilis  | Limber pine                  | All             |

### Description

Bare ground and talus with sparse ground cover of forbs, grasses, and low shrubs. Occasional old survivors may be present. Surface fire and weather-related stress affect this class but without consequences to dynamics.

### Maximum Tree Size Class

Sapling >4.5ft; <5" DBH

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|                |           |                                 |
|----------------|-----------|---------------------------------|
| <b>Class B</b> | <b>21</b> | <b>Mid Development 1 - Open</b> |
|----------------|-----------|---------------------------------|

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### Indicator Species

| Symbol | Scientific Name | Common Name                  | Canopy Position |
|--------|-----------------|------------------------------|-----------------|
| PILO   | Pinus longaeva  | Great basin bristlecone pine | Upper           |
| PIFL2  | Pinus flexilis  | Limber pine                  | Upper           |

### Description

Open woodland of seedlings, saplings, and survivors.

### Maximum Tree Size Class

Pole 5-9" DBH

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|                |           |                                  |
|----------------|-----------|----------------------------------|
| <b>Class C</b> | <b>60</b> | <b>Late Development 1 - Open</b> |
|----------------|-----------|----------------------------------|

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### Indicator Species

| Symbol | Scientific Name | Common Name                  | Canopy Position |
|--------|-----------------|------------------------------|-----------------|
| PILO   | Pinus longaeva  | Great basin bristlecone pine | Upper           |
| PIFL2  | Pinus flexilis  | Limber pine                  | Upper           |

### Description

Open woodland with mixed tree diameters, seedlings to 40in DBH. Sparse ground cover of grasses and low shrubs. Very old trees can develop in this class. Tree heights are 5.1-25m.

### 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    | 99            |
| Mid1:OPN   | 100            | Late1:OPN   | 249           |
| Late1:OPN  | 250            | Late1:OPN   | 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 |
|---------------------------|-----------------------|---------------------|-------------------------|-----------------------|-----------------------------------------------------|------------------------------|
| Replacement Fire          | Early1:ALL            | Early1:ALL          | 0.002                   | 500                   | Yes                                                 | 0                            |
| Surface 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                            |
| Surface Fire              | Mid1:OPN              | Mid1:OPN            | 0.005                   | 200                   | No                                                  | 0                            |
| Replacement Fire          | Late1:OPN             | Early1:ALL          | 0.002                   | 500                   | Yes                                                 | 0                            |
| Surface Fire              | Late1:OPN             | Late1:OPN           | 0.005                   | 200                   | No                                                  | 0                            |

## **References**

Howard, J.L. 2004. *Pinus longaeva*. In: Fire Effects Information Systems [Online]. USDA Forest Service, Rocky Mountain Research Station, Forest Sciences Lab (Producer). Available: <http://www.fs.fed.us/database/feis> Accessed February 23, 2005.

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