16062

Western North American Boreal Dry Aspen-Steppe Bluff - Higher Elevations

BpS Model/Description Version: Nov. 2024

|  |  |  |  |
| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
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| None | None | None | None |

Vegetation Type

Forest and Woodland

Map Zones

74

Model Splits or Lumps

This Biophysical Setting (BpS) is split into multiple models:

Western North American Boreal Dry Aspen-Steppe Bluff was split into a lower elevation and a higher elevation model. The lower elevation model occurs below treeline and trees are present. The higher elevation model generally occurs above treeline although sparse aspen (<10% cover) may be present.

Geographic Range

This BpS occurs at high elevations throughout the boreal and sub-boreal regions of AK.

Biophysical Site Description

This low open shrub system occurs in the alpine or subalpine on steep, south-facing, wind-swept bluffs and ridges. It may be associated with river systems above treeline. The substrate is steep, unstable, dry mineral soil. Rocky outcrops are common.

Vegetation Description

The vegetation cover in this system is typically open and discontinuous with much exposed mineral soil. *Artemisia* species are the primary characteristic dominants, but this system supports a unique assemblage of species including *Artemisia frigida, Artemisia alaskana, Juniperus communis, Arctostaphylos uva-ursi, Pseudoroegneria spicata* (= *Agropyron spicatum*), *Bromus pumpellianus, Calamagrostis purpurascens, Festuca altaica,* and *Poa* spp. (Chapin et al. 2006). *Populus tremuloides* may be present, but canopy cover is less than 10% (NatureServe 2008).

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| ARFR4 | *Artemisia frigida* | Prairie sagewort |
| ARAL5 | *Artemisia alaskana* | Alaska wormwood |
| PSSP6 | *Pseudoroegneria spicata* | Bluebunch wheatgrass |
| JUCO6 | *Juniperus communis* | Common juniper |
| ARUV | *Arctostaphylos uva-ursi* | Kinnikinnick |
| BRINA | *Bromus inermis ssp. pumpellianus var. arcticus* | Pumpelly's brome |
| CAPU | *Calamagrostis purpurascens* | Purple reedgrass |

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

Disturbance Description

The fire regime for this BpS is expected to be similar to that of the adjacent Western North American Boreal Dry Aspen-Steppe Bluff - Lower Elevations. However, this system has less fuel, which would tend to produce fewer and patchier fires.

Because this BpS is often found on unstable slopes with dry mineral soils, shifting slopes are an ongoing disturbance. Grazing is probably an important factor in shaping this system, as this is important Dall sheep habitat. Neither grazing nor erosion were included as disturbances in the model because these are long-term, ongoing phenomena.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 253 | 100 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 253 | 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

Linear; small patch

Adjacency or Identification Concerns

This system is similar to Western North American Boreal Dry Aspen-Steppe Bluff - Lower Elevations but lacks aspen and rose as dominant species. This system occurs above treeline and may be adjacent to Western North American Boreal Dry Aspen-Steppe Bluff - Lower Elevations, which includes a mosaic of aspen and steppe vegetation.

Issues or Problems

Native Uncharacteristic Conditions

Comments

4/2022 – The fire frequency of this BpS was adjusted based on feedback from experts who attended the Boreal Forest BpS Review Work Session in February 2022. At that session, participants ranked the boreal forest BpS by relative fire frequency. Based on that ranking it was estimated that this BpS would have a mean fire return interval of approximately 250 years.

During LANDFIRE National this model was created for the boreal region of AK and did not receive review for other parts of the state.

Suggested reviewers for this system include: Carl Roland and Dalia Vargis-Kretzinger for information on grazing.

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 | B | B | B | B | B | B | B | B | B | B |
| Shrub | 0.5-1.0 | B | B | B | B | B | B | B | B | B | B |
| Shrub | 1.0-3.0 | B | B | B | B | B | B | B | B | B | B |
| Shrub | >3.0 | B | B | B | B | B | B | B | B | B | B |
| Tree | 0-5 | B | B | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 5-10 | B | B | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 10-25 | B | B | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 25-50 | B | B | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | >50 | B | B | UN | UN | UN | 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**

Class A 2 Early Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PSSP6 | *Pseudoroegneria spicata* | Bluebunch wheatgrass | Upper |
| BRINA | *Bromus inermis* ssp*. pumpellianus var. arcticus* | Pumpelly's brome | Upper |
| CAPU | *Calamagrostis purpurascens* | Purple reedgrass | Upper |
| FEAL | *Festuca altaica* | Altai fescue | Upper |

Description

Post-disturbance dry herbaceous or sparse shrubs. Grasses typically dominate the site. Shrubs may sprout from rootstock. Herbaceous cover tends to be open or sparse. In some cases, grasses may be absent, and the ground will be bare until shrubs resprout. *Pseudoroegneria spicata* (= *Agropyron spicatum*), *Bromus pumpellianus, Calamagrostis purpurascens* and *Festuca* spp. are typical species. *Artemisia frigida* and *Artemisia alaskana* are typically regenerating in the understory.

*Maximum Tree Size Class*  
None

Class B 98 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ARFR4 | *Artemisia frigida* | Prairie sagewort | Upper |
| ARAL5 | *Artemisia alaskana* | Alaska wormwood | Upper |
| PSSP6 | *Pseudoroegneria spicata* | Bluebunch wheatgrass | Upper |
| BRINA | *Bromus inermis* ssp*. pumpellianus var. arcticus* | Pumpelly's brome | Upper |

Description

Dry, low, open shrubs or mature shrubs. Shrubs become dominant, but an herbaceous layer usually persists. Shrub cover is 25-75%. *Artemisia frigida* and *Artemisia alaskana* dominate. Common grasses include *Pseudoroegneria spicata* (= *Agropyron spicatum*), *Bromus pumpellianus* and *Calamagrostis purpurascens*. *Populus tremuloides* may be present, but canopy cover is less than 10%.

*Maximum Tree Size Class*  
Pole 5-9" DBH

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:OPN | 0 | Late1:OPN | 4 |
| Late1:OPN | 5 | 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:OPN | Early1:OPN | 0.004 | 250 | Yes | 0 |
| Replacement Fire | Late1:OPN | Early1:OPN | 0.004 | 250 | Yes | 0 |

References

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