11710

North Pacific Alpine and Subalpine Dry Grassland

BpS Model/Description Version: Aug. 2020

|  |  |  |  |
| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
| John Foster | jfoster@tnc.org | Rod Clausnitzer | rclausnitzer@fs.fed.us |
| Kori Buford | kbuford@tnc.org | None | None |
| None | None | None | None |

Vegetation Type

Herbaceous

Map Zone

1

Geographic Range

This type is most extensive in the eastern Cascades, although it also occurs in the Olympic Mountains.

Biophysical Site Description

This is a high-elevation grassland system that is dominated by perennial grasses and forbs. It appears on dry sites, particularly on south-facing slopes, and is typically embedded in or above subalpine forests and woodlands. Subalpine grasslands are small meadows to large open parks surrounded by conifer trees but lacking continuous tree cover within them. In general, soil textures are much finer, and soils are often deeper under grasslands than in the neighboring forests. Grasslands, although composed primarily of tussock-forming species, do exhibit a dense sod that makes root penetration difficult for tree species. Sites are often wind-swept, resulting in lack of snowpack and summer drought (Daubenmire 1981).

Vegetation Description

Typical dominant species include *Festuca idahoensis*, *Festuca viridula*, and *Festuca roemeri* (the latter species occurring only in the Olympic Mountains). *Xerophyllum tenax* occurs in more maritime environments and will increase west and south in the Cascades.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| FEID | *Festuca idahoensis* | Idaho fescue |
| FEVI | *Festuca viridula* | Greenleaf fescue |
| FERO | *Festuca roemeri* | Roemer's fescue |

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

Disturbance Description

Fire regimes are probably similar to adjacent forested vegetation and will generally be long-interval, stand-replacement regimes (Fire Regime Group IV). Fires may finger into this system from adjacent forests. Conifer encroachment is not common due to the droughty nature of these grasslands, but undoubtedly fire also plays some role in preventing conifer encroachment.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 509 | 100 | 75 | 500 |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 509 | 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

Patches are typically 10s-100s ac.

Adjacency or Identification Concerns

Historical sheep grazing may have occurred in these systems. The cumulative effects are unknown. This system is similar to Northern Rocky Mountain Subalpine Dry Grassland (CES306.806) but differs in that it includes dry alpine habitats, more North Pacific floristic elements, greater snowpack, and higher precipitation.

Issues or Problems

Modelers were not familiar with this type.

Native Uncharacteristic Conditions

Comments

Model for map zone (MZ)01 and MZ07 built from the NatureServe description and from BpS 101140-Northern Rocky Mountain Subalpine-Upper Montane Grassland authored by Phillips, Walker, and Kaiser. Jan Henderson and Jimmy Kagan provided input on the fire return interval for MZ01.

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 | B | B | B | B | B | B | B |
| Herb | 0.5-1.0 | A | A | A | B | B | B | B | B | B | B |
| Herb | >1.0 | A | A | A | B | B | B | B | B | B | B |
| 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 | B | B | B | UN | UN | UN | UN | UN |
| Tree | 5-10 | B | B | B | B | B | UN | UN | UN | UN | UN |
| Tree | 10-25 | B | B | B | B | B | UN | UN | UN | UN | UN |
| Tree | 25-50 | B | B | B | B | B | UN | UN | UN | UN | UN |
| Tree | >50 | B | B | B | B | B | 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 1 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| FEVI | Festuca viridula | Greenleaf fescue | Upper |
| FEID | Festuca idahoensis | Idaho fescue | Upper |
| PSSP6 | Pseudoroegneria spicata | Bluebunch wheatgrass | Upper |
| XETE | Xerophyllum tenax | Common beargrass | Upper |

Description

Post-replacement disturbance conditions dominated by herbs and sprouting grasses including green fescue, Idaho fescue, bluebunch wheatgrass, *Xerophyllum tenax*, or *Epilobium* spp. Succession to Class B.

*Maximum Tree Size Class*  
None

Class B 99 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| FEVI | Festuca viridula | Greenleaf fescue | Upper |
| FEID | Festuca idahoensis | Idaho fescue | Upper |
| PSSP6 | Pseudoroegneria spicata | Bluebunch wheatgrass | Upper |
| XETE | Xerophyllum tenax | Common beargrass | Upper |

Description

Closed herbaceous cover dominated by green fescue, Idaho fescue, bluebunch wheatgrass, and *Xerophyllum tenax*. Low shrubs may be present, particularly mountain big sagebrush, *Erigonum* spp., and *Phlox* spp.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Late1:CLS | 4 |
| Late1:CLS | 5 | 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** |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.002 | 500 | Yes | 0 |

References

Daubenmire, Rexford. 1981. Subalpine parks associated with snow transfer in the mountains of northern Idaho and eastern Washington. Northwest Science. 55(2): 124-135.

Daubenmire, Rexford F. and Jean B. Daubenmire. 1968. Forest vegetation of eastern Washington and northern Idaho. Technical Bulletin 60. Pullman, WA: Washington State University, Agricultural Experiment Station. 104 pp.

Franklin, Jerry F.; Dyrness, C. T. 1973. Natural vegetation of Oregon and Washington. Gen. Tech. Rep. PNW-8. Portland, OR: USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. 417 pp.

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