11400

Northern Rocky Mountain Subalpine-Upper Montane Grassland

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Herbaceous

Map Zones

29

Geographic Range

Northern ID, western MT and eastern WA. In MZ20, this system is very limited in extent. In MZ20, this probably only occurs in some of the more mountainous areas - ie: MLRA 43B Central Rocky Mountains, which corresponds to subsection M332Db, and just below Havre in 331Ka. This BpS might also be just creeping into MZ20 from the corners of MZ19, on the southwest corner of MZ20.

In MZ29, just in M331Ba - Bighorn, Pryor Mtns. This also occurs in MZ29 in the mountains near Casper, WY and in uplift southwest of Broadus, MT, bordering WY.

Biophysical Site Description

This is a high-elevation (>6,000ft), dry grassland system dominated by perennial grasses and forbs. It might occur on all aspects, and not necessarily only dry sites. Subalpine grasslands are small meadows to large open parks surrounded by conifer trees but lack tree cover within them. In general soil textures are much finer, and soils are often deeper under grasslands than in the neighboring forests. Sites are often wind-swept, resulting in lack of snowpack and summer drought (Daubenmire 1981).

Vegetation Description

Typical dominant species include: *Festuca idahoensis*, *Aster* spp., *Eriogonum* spp., *Lupinus* spp., *Xerophyllum tenax*, and *Deschampsia caespitosa* (*Deschampsia* has been grazed out currently in many areas). Rough fescue is present in MZ20 but not in 29. Bluebunch also wouldn't be present in MZ20 - would occur on much drier slopes. Bluebunch is major co-dominant in MZ29 with Idaho fescue. Would also have junegrass and Sandberg bluegrass, and threadleaf sedge, *Agropyron caninum* in MZ29 as associated species. Would have Richardson's needlegrass, western needlegrass, Letterman's needlegrass. Also in MZs 20 and 29 - *Balsamorhiza sagittata*, *Bromus marginatus*, *Carex* spp., *Geranium viscossimum*, and *Geum triforum* (mesic forbs).

Adjacent forest types would be limber pine, Douglas-fir and subalpine fir spruce, intermingled throughout. Grasslands intermingled within the mosaic of the conifers.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| PSSP6 | *Pseudoroegneria spicata* | Bluebunch wheatgrass |
| FEID | *Festuca idahoensis* | Idaho fescue |
| ASTER | *Aster* | Aster |
| ERIOG | *Eriogonum* | Buckwheat |
| ACRI8 | *Achnatherum richardsonii* | Richardson's needlegrass |
| KOMA | *Koeleria macrantha* | Prairie junegrass |
| TRSP2 | *Trisetum spicatum* | Spike trisetum |
| ACOC3 | *Achnatherum occidentale* | Western needlegrass |

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. Fires may finger into this system from adjacent forests.

There is some question as to whether this should have a shorter fire return interval. However, some other mapzones modeled this system with a long FRI (150-300yrs in MZs 10 and 19), which is supported by the fact that it is a high elevation system with few trees, and it is described by NatureServe as "upper montane to subalpine, high-elevation, lush grassland system dominated by perennial grasses and forbs on dry sites… subalpine dry grasslands…" However, the low end of the MFRI range could go as low as 40yrs, given the inclusion of dry low-elevation grasses in this model, but the inclusion of moist-high elevation XETE definitely argues for a higher MFRI; so an overall 75yrs MFRI was chosen for MZ29. This 75yr MFRI is similar to the MFRI chosen for MZ20's 1145 as well, since the range could vary greatly and due to both of the systems' ambiguous descriptions.

The foothill-montane 1139 would be the transitional system around the Pryors - between plains/grassland/shrubland transitioning into limber pine, Rocky Mountain Juniper and lower elevation Douglas-fir. In BpS 1140, we're describing above treeline. So foothill/lower montane would have a shorter FRI, and BpS 1140 subalpine would have a longer FRI.

Conifer encroachment is not common due to the droughty nature of these grasslands, but undoubtedly fire also plays some role in preventing conifer encroachment. This system is a climatic climax - site maintained grassland system.

Historically, sheep grazing probably occurred more frequently than currently. Some accounts of bison and elk grazing but unsure of extent.

Periodic drought could have impacted this system. Unsure of frequency.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 79 | 100 | 40 | 200 |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 79 | 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 tens to hundreds of acres.

Adjacency or Identification Concerns

This 1140 is a subalpine-upper montane, not the foothill/montane grassland in MZ29. The foothill-montane 1139 would be the transitional system around the Pryors - between plains/grassland/shrubland transitioning into limber pine, RM Juniper, lower elevation Douglas-fir. In BpS 1140, we're describing above treeline.

Adjacent forest types would be limber pine, Douglas- fir and subalpine fir spruce, intermingled throughout. Grasslands intermingled within the mosaic of the conifers.

This system could be confused with adjacent foothill grassland type and more open sagebrush systems.

1140 is also very similar to 1146, the southern version of this type. For MZs 29 and 30, reviewers considered just using 1140 and not 1146.

Current grazing is by cattle and sheep. Elk also graze currently in this system.

This system would probably not seem departed from historical. However, encroachment might be occurring adjacent to forested stands - trees might be encroaching - Douglas-fir and limber pine, but this isn't occurring as much in subalpine limit. This might be occurring in upper montane elevation limit.

Timothy, Kentucky bluegrass and smooth brome are invaders in this system in MZs 20 and 29. Where these invasives occur, they take over.

Issues or Problems

Native Uncharacteristic Conditions

Taller than one meter grasses would be uncharacteristic.

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 | 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 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | 0.5-1.0 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | 1.0-3.0 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | >3.0 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 0-5 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 5-10 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 10-25 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 25-50 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | >50 | UN | UN | 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 5 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PSSP6 | Pseudoroegneria spicata | Bluebunch wheatgrass | Upper |
| FEID | Festuca idahoensis | Idaho fescue | Upper |
| ACOC3 | Achnatherum occidentale | Western needlegrass | Upper |
| BASA | Baccharis salicina | Great plains false willow | Upper |

Description

Post-replacement disturbance conditions dominated by herbs and sprouting grasses including green fescue, Idaho fescue, bluebunch wheatgrass, *Xerophyllum tenax*, or *Epilobium* spp. See Veg Description for species.

*Maximum Tree Size Class*  
None

Class B 95 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PSSP6 | Pseudoroegneria spicata | Bluebunch wheatgrass | Upper |
| FEID | Festuca idahoensis | Idaho fescue | Upper |
| ACOC3 | Achnatherum occidentale | Western needlegrass | Upper |
| BASA | Baccharis salicina | Great plains false willow | 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. See Veg Description for species.

*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 | 0.0133 | 75 | Yes | 0 |

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