11400

Northern Rocky Mountain Subalpine-Upper Montane Grassland

BpS Model/Description Version: Aug. 2020

|  |  |  |  |
| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
| Reggie Clark | rmclark@fs.fed.us | Bill Romme | romme@warnercnr.colostate.edu |
| Clayton Marlow | cmarlow@montana.edu | Jim Ozenberger | jozenberger@fs.fed.us |
| John Simons | john\_simons@blm.gov | Andy Norman | anorman@fs.fed.us |

Vegetation Type

Herbaceous

Map Zones

21

Geographic Range

Southern MT, northwestern WY and eastern ID.

Biophysical Site Description

This is a high-elevation (>6,000ft), dry grass-forb system dominated by perennial grasses and forbs, on dry sites particularly south-facing slopes. 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. Larger sites are often wind-swept, resulting in lack of snowpack and summer drought, but smaller ones can have deeper snowpack and more forbs.

This is also more of a mid-to-high elevation, rather than high elevation type. Coarse soils should also be included. The mesic meadow BpS will encompass finer soils.

Vegetation Description

Typical dominant species include *Festuca idahoensis*, *Aster* spp., *Eriogonum* spp., *Lupinus* spp., *Carex* spp., *Phleum alpinum*, *Bromus marginatus*, *Danthonia* spp., *Geranium* spp., *Potentilla* spp., *Pseudoroegneria spicata*, *Balsamorhiza sagittata*, *Helianthella uniflora*, *Hesperochloe kineii*, *Antennaria* spp., *Poa secunda*, *Elymus trachycaulus*, *Elymus lanceolatus*, *Agastache urticifolia*, *Wyethia amplexicaulis*, *Pedicularis* spp., and *Melica spectabilis*.

In this environment (and a number of the other grassland, shrub steppe types) forb density and cover are most responsive to climatic conditions. Hence fire response will vary according to precipitation patterns before and immediately after the fire. Grasses are less “ephemeral” and tend to respond to the fire directly. That’s why we elected to not identify specific forb species response.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| FEID | *Festuca idahoensis* | Idaho fescue |
| ASTER | *Aster* | Aster |
| ERIOG | *Eriogonum* | Buckwheat |
| BROMU | *Bromus* | Brome |
| DANTH | *Danthonia* | Oatgrass |

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. Conifer encroachment is not common due to the disturbance by pocket gophers and competition with grasses.

It is debatable as to whether fire is needed at moderately high frequencies to keep sagebrush out of these grassland systems, or whether sagebrush is invading in current times due to overgrazing and/or climate change.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 205 | 100 | 100 | 500 |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 205 | 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

Historical sheep grazing may have occurred in these systems. The cumulative effects are unknown.

Some grassland systems are invaded by sagebrush today in larger quantities. Pre-European settlement they would have been grassland systems, whereas today they might be confused for some big sagebrush systems.

Issues or Problems

Native Uncharacteristic Conditions

Comments

For MZ21, additional modelers include Tim Klukas and an anonymous contributor. Additional reviewers for MZ21 included Rod Dykehouse, Sarah Canham, Brenda Fiddick, and Dave Tart.

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

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| FORBS | <NOT FOUND IN NRCS> | <NOT FOUND IN NRCS> | Upper |
| FEID | Festuca idahoensis | Idaho fescue | Upper |
| PSSP6 | Pseudoroegneria spicata | Bluebunch wheatgrass | Upper |
| ASTER | Aster | Aster | Upper |

Description

Post-replacement disturbance conditions dominated by herbs and grasses including Idaho fescue, bluebunch wheatgrass, or *Epilobium* spp.

In this environment (and a number of the other grassland, shrub steppe types) forb density and cover are most responsive to climatic conditions. Hence fire response will vary according to precipitation patterns before and immediately after the fire. Grasses are less “ephemeral” and tend to respond to the fire directly. That’s why we elected to not identify specific forb species response.

*Maximum Tree Size Class*  
None

Class B 99 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| FORBS | <NOT FOUND IN NRCS> | <NOT FOUND IN NRCS> | Upper |
| FEID | Festuca idahoensis | Idaho fescue | Upper |
| PSSP6 | Pseudoroegneria spicata | Bluebunch wheatgrass | Upper |
| ASTER | Aster | Aster | Upper |

Description

Closed herbaceous cover dominated by Idaho fescue, bluebunch wheatgrass, *Erigonum* spp., *Phlox* spp., *Carex* spp., *Bromus marginatus*, and *Danthonia* spp.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Late1:CLS | 3 |
| Late1:CLS | 4 | 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 | 0.005 | 200 | Yes | 0 |

References

NOTE: References imported from previous modeled mapzones for this BpS.

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

Daubenmire, RF. and J.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, J.F. and C.T. Dyrness. 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.