11420

Columbia Basin Palouse Prairie

BpS Model/Description Version: Aug. 2020

Update: 6/5/2018

|  |  |  |  |
| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
| Rex Crawford | rex.crawford@wadnr.gov | None | None |
| Jimmy Kagan | jimmy.kagan@oregonstate.edu | None | None |
| Don Major | dmajor@tnc.org | None | None |

Vegetation Type

Herbaceous

Map Zones

8

Geographic Range

This once-extensive grassland system occurs in southern British Columbia, eastern Washington and Oregon. This biophysical setting (BpS) likely occurs as remnant patches in the Owyhee Upland province Payette section of the Columbia Plateau.

Biophysical Site Description

This BpS is characterized by rolling topography composed of loess hills and plains over basalt plains. The climate of this region has warm-hot, dry summers, and cool, wet winters. Remnant grasslands are now typically restricted to steep and rocky sites.

Vegetation Description

This BpS characterizes one of the most endangered ecosystems in the U.S. with only 1% of the original habitat remaining; it is highly fragmented with most sites <10ac. The cool-season bunchgrasses that dominate the vegetation are adapted to winter precipitation. Characteristic species are *Pseudoroegneria spicata* and *Festuca idahoensis* with *Hesperostipa comata, Achnatherum scribneri, Leymus condensatus, Leymus cinereus, Koeleria macrantha, Pascopyrum smithii*, or *Poa secunda*. Shrubs commonly found include *Amelanchier alnifolia, Rosa* spp, *Eriogonum* spp, *Symphoricarpos albus,* and *Crataegus douglasii*.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| PSSP4 | *Pseudelephantopus spicatus* | Dog's-tongue |
| FEID | *Festuca idahoensis* | Idaho fescue |
| HECO | *Hedeoma costata* | Ribbed false pennyroyal |
| ACSC | *Acacia schottii* | Schott's wattle |
| AMAL | *Amaranthus albus* | Prostrate pigweed |

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

Disturbance Description

Excessive grazing, past land use and invasion by introduced annual species have resulted in a massive conversion to agriculture or shrub-steppe and annual grasslands dominated by *Artemisia* spp, and *Bromus tectorum* or *Poa pratensis*.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 25 | 72 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) | 64 | 28 |  |  |
| All Fires | 18 | 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

Large patch.

Adjacency or Identification Concerns

Issues or Problems

Native Uncharacteristic Conditions

Shrub cover >50% might be a mixed deciduous shrubland.

Comments

This model was initiated from the model from mapping map zone (MZ)18, but Crawford and Kagan added two more boxes to show shrub invasion. This BpS is likely rare in MZ18. Don Major incorporated components of other dry grassland system models to describe this system.

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 | B | B | B | B | B | B | B | B | B | B |
| Shrub | 0-0.5 | C | C | D | D | D | UN | UN | UN | UN | UN |
| Shrub | 0.5-1.0 | C | C | D | D | D | UN | UN | UN | UN | UN |
| Shrub | 1.0-3.0 | C | C | D | D | D | UN | UN | UN | UN | UN |
| Shrub | >3.0 | C | C | D | D | D | UN | UN | UN | UN | UN |
| Tree | 0-5 | C | C | D | D | D | UN | UN | UN | UN | UN |
| Tree | 5-10 | C | C | D | D | D | UN | UN | UN | UN | UN |
| Tree | 10-25 | C | C | D | D | D | UN | UN | UN | UN | UN |
| Tree | 25-50 | C | C | D | D | D | UN | UN | UN | UN | UN |
| Tree | >50 | C | C | D | D | D | 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 15 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PSSP4 | Pseudelephantopus spicatus | Dog's-tongue | Upper |
| FEID | Festuca idahoensis | Idaho fescue | Upper |

Description

This early seral community follows a topkill event in which cover of bunch grasses and perennial forbs has been reduced. Forb composition is relatively higher in this stage than at later stages.

*Maximum Tree Size Class*  
None

Class B 78 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PSSP4 | Pseudelephantopus spicatus | Dog's-tongue | Upper |
| FEID | Festuca idahoensis | Idaho fescue | Upper |

Description

Very little bare ground, litter cover is high. Plants are vigorous and well established. Fires are rarely lethal, and the community responds quickly to fire.

*Maximum Tree Size Class*  
None

Class C 5 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PSSP4 | Pseudelephantopus spicatus | Dog's-tongue | Low-Mid |
| FEID | Festuca idahoensis | Idaho fescue | Low-Mid |
| ROSA | Rorippa sarmentosa | Longrunner | Middle |
| PRVI | Prunus virginiana | Chokecherry | Upper |

Description

Very little bare ground with high litter cover. Bunchgrasses are well-established with high cover, high forb richness. There are scattered deciduous shrubs (*Rosa* spp, *Prunus virginiana*, *Amelanchier alnifolia*, and *Crataegus* spp) usually in patches at or above the height of bunchgrasses. Shrubs concentrated in concave microsites and near riparian zones. Three-tipped sagebrush and/or northern buckwheat maybe present on drier sites in the western portions of the Palouse. This stage is more likely to develop on northerly aspects. Fire intervals 20-50yrs.

*Maximum Tree Size Class*  
None

Class D 2 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ROSA | Rorippa sarmentosa | Longrunner | Low-Mid |
| PRVI | Prunus virginiana | Chokecherry | Upper |
| AMAL2 | Amelanchier alnifolia | Saskatoon serviceberry | Mid-Upper |
| CRATA | Crataegus | Hawthorn | Upper |

Description

Deciduous shrubs occur in dense patches with sparse undergrowth of bunchgrasses and associated prairie forbs. Shrubs overtop herbaceous species and merge with riparian shrub thickets, particularly on northerly aspects. Bunchgrass dominance occurs on convex landforms and southerly aspects. Fire interval is over 50yrs allowing shrubs to increase by sprouting.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:CLS | 4 |
| Mid1:CLS | 5 | Mid1:CLS | 204 |
| Mid1:OPN | 10 | Mid1:OPN | 999 |
| Late1:CLS | 20 | 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 | Early1:ALL | Early1:ALL | 0.04 | 25 | Yes | 0 |
| Alternative Succession | Mid1:OPN | Late1:CLS | 0.005 | 200 | Yes | 0 |
| Replacement Fire | Mid1:OPN | Early1:ALL | 0.04 | 25 | Yes | 0 |
| Alternative Succession | Mid1:CLS | Mid1:OPN | 0.003 | 333 | Yes | 0 |
| Surface Fire | Mid1:CLS | Mid1:CLS | 0.02 | 50 | No | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.04 | 25 | Yes | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.015 | 67 | Yes | 0 |

References

Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, K. Snow and J. Teague. 2003. Ecological Systems of the United States: A Working Classification of U.S. Terrestrial Systems. NatureServe, Arlington, Virginia. Available online at: http://www.natureserve.org/publications/usEcologicalsystems.jsp

Daubenmire, R. 1988. Steppe vegetation of Washington. Washington State University Cooperative Extension Service Publication EB1446. (Revised from and replaces Washington Agricultural Experiment Station Publication XT0062.) 131 pp.

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

Tisdale, E.W. 1982. Grasslands of western North America: The Pacific Northwest bunchgrass. Pages 223-245 in: A.C. Nicholson, A. Mclean, and T.E. Baker, editors. Grassland Ecology and Classification Symposium, Kamloops, BC.