11450

Rocky Mountain Subalpine-Montane Mesic Meadow

BpS Model/Description Version: Aug. 2020

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| --- | --- | --- | --- |
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Vegetation Type

Herbaceous

Map Zones

20

Geographic Range

Found in the Rocky Mountains. In MZ20, this BpS is very limited in extent.

Biophysical Site Description

This type is a lower montane to subalpine type found above 2,000m in elevation in the southern part of its range and above 600m in the northern part. Finely textured soils. Snow deposition and wind swept dry conditions limit tree establishment. On gentle to moderate gradient slopes. Soils seasonally moist in spring, drying out later in the growing season.

Vegetation Description

Vegetation is typically forb-rich, with forbs contributing more to overall herbaceous cover than graminoids. Important taxa include *Agastache urticifolia*, *Chamerion angustifolium*, *Erigeron* spp., *Senecio* spp., *Helianthella* spp., *Mertensia* spp., *Penstemon* spp., *Campanula* spp., *Hackelia* spp., *Lupinus* spp., *Solidago* spp., *Ligusticum* spp., *Osmorhiza* spp., *Thalictrum* spp., *Valeriana* spp., *Veratrum* spp., *Delphinium* spp., *Aconitum* spp., *Balsamorhiza sagitatta*, and *Wyethia* spp. Burrowing mammals can increase for density.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| ERIGE2 | *Erigeron* | Fleabane |
| MERTE | *Mertensia* | Bluebells |
| PENST | *Penstemon* | Beardtongue |
| CAMPA | *Campanula* | Bellflower |
| LUPIN | *Lupinus* | Lupine |
| SOLID | *Solidago* | Goldenrod |
| DECA18 | *Deschampsia caespitosa* | Tufted hairgrass |
| KOELE | *Koeleria* | Junegrass |

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

Disturbance Description

Fires are primarily replacement. The ignition source is generally not in this type and spreads from adjacent shrub or tree dominated sites, such as lodgepole pine, mountain big sagebrush, ponderosa pine and aspen.

For MZs 10 and19, the fire frequency of 40yrs was estimated based on adjacent aspen, herbaceous and sagebrush communities. Also, because fire was assumed to occur in the fall and spring when the summer's green and wet biomass would be dead and cured, replacement fire has little effect on annual tall forbs themselves. Fires would affect encroaching shrubs.

During review for MZ20, this frequent fire return interval was questioned. Multiple other models (in the Great Basin and MZs 10 and 19) used a frequent FRI, as this type occurs in mosaics with woodlands and dense shrublands. It is doubtful, however, that mesic, forbaceous meadows above 3000m would ever have MFIs of less than 150-300yrs, in contrast to the Great Basin's model and FRI of 40yrs. If this type is primarily a high elevation, subalpine wet-forb community (ie, MZs 10 and 19 description says >3,000m--which would be too high for the Northern Rockies, where it would be more like 2,000-3,000m), a 150-200yr MFI would likely apply. However, if this type is a lower montane-to-subalpine type (as per NatureServe (NS) description), a lower MFI could apply. MZ20 decided to go with a model with a 75-100yrs MFI (using 85yrs MFI as a midpoint), since NS's description called for more of that type of an MFI as opposed to the high-high elevation, which would not occur in the Northern and Central Rockies (Barrett, pers comm). Also - this 85yr MFI is similar to the MFI chosen for MZ20's 1140 as well, since the range could vary greatly and due to both of the systems' ambiguous descriptions.

Moreover, the general absence of frequently fire-scarred trees adjacent to high elevation mesic meadows suggests that the BpS likely has fire frequencies similar to the adjacent treed landscape (Barrett, pers comm). The MFI depends on the size of these meadows and fuel load of adjacent vegetation presumably conifer forest. If the meadow is larger, it might act as a fire break and not completely burn. It depends on the moisture in the meadow and fuel load. Determining one value for an MFI will be difficult - will depend on size of meadow, landscape position and associated valley type, and surrounding veg type and patterns of fuel build-up, moisture, density and type of meadow - wet, dry, forb dominated, sedge dominated, moss dominated, etc. (Manning, pers comm).

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 84 | 100 | 30 | 200 |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 84 | 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

Range in size from less than ten acres to 300ac.

Adjacency or Identification Concerns

This BpS could be confused with low forb/alpine shrub communities. Often adjacent to aspen/tall forb communities, mountain or big sagebrush/tall forb communities and upper montane/subalpine spruce-fir communities. In degraded sites this community may convert to silver sagebrush/tall forb.

With heavy grazing these sites can convert to undesirable forbs and grasses such as *Circium* spp. (thistle), *Galium* spp. (bedstraw), *Rudbeckia occidentalis* (coneflower), *Helenium hoopesii* (Orange sneezeweed), *Polygonum* spp. (knotweed), *Rumex* spp. (sorrel or dock), *Taraxacum officinale* (dandelion), *Wyethia amplexicaulis* (mulesears), *Madia glomerata* (mountain tarweed), *Descurainia* spp. (tansymustard), *Nemophila brevifolia* (basin blue eyes), *Poa pratensis* (Kentucky bluegrass), *Agrostis exarata* (bentgrass), *Dactylis glomerata* (orchardgrass), *Bromus inermis* (smooth brome), *Bromus tectorum* (cheatgrass), *Poa bulbosa* (bulbous bluegrass), and *Vulpia octoflora* (six-week fescue). Roads and trails can impact these sites.

Issues or Problems

There is not much information about this type.

Native Uncharacteristic Conditions

Comments

This model for MZ20 was adapted from the model for the same BpS from MZ19 created by Cheri Howe and Julia Richardson and reviewed by Nathan Williamson, Vic Ecklund and Chuck Kostecka. Quantitative and descriptive changes were made to better fit the concept of this BpS, especially for NCR; original modelers' names were still retained, as they created most of the model (at request of MZ20 modelers).

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 | B | B | B | 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 | C | C | C | C | C | C | C | C |
| Shrub | 0.5-1.0 | C | C | C | C | C | C | C | C | C | C |
| Shrub | 1.0-3.0 | C | C | C | C | C | C | C | C | C | C |
| Shrub | >3.0 | C | C | C | C | C | C | C | C | C | C |
| Tree | 0-5 | C | C | C | C | C | UN | UN | UN | UN | UN |
| Tree | 5-10 | C | C | C | C | C | UN | UN | UN | UN | UN |
| Tree | 10-25 | C | C | C | C | C | UN | UN | UN | UN | UN |
| Tree | 25-50 | C | C | C | C | C | UN | UN | UN | UN | UN |
| Tree | >50 | C | C | C | C | C | 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** |
| ERIGE2 | Erigeron | Fleabane | Upper |
| LUPIN | Lupinus | Lupine | Upper |
| DECA18 | Deschampsia caespitosa | Tufted hairgrass | Upper |

Description

Vegetation is typically forb-rich, with forbs contributing more to overall herbaceous cover than graminoids.

*Maximum Tree Size Class*  
None

Class B 21 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ERIGE2 | Erigeron | Fleabane | Upper |
| LUPIN | Lupinus | Lupine | Upper |
| DECA | Delphinium californicum | California larkspur | Upper |

Description

Vegetation is typically forb-rich, with forbs contributing more to overall herbaceous cover than graminoids. Some increase in shrub component, shrubs young and less than five percent cover.

*Maximum Tree Size Class*  
None

Class C 77 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ASTER | Aster | Aster | Middle |
| LUPIN | Lupinus | Lupine | Middle |
| ROWO | Rosa woodsii | Woods' rose | Middle |
| RIBES | Ribes | Currant | Middle |

Description

Vegetation is typically forb-rich, with forbs contributing more to overall herbaceous cover than graminoids. Five to 10% of cover in late seral may be woody species from adjacent plant communities such as *Populus tremuloides*, *Artemisia cana*, *Artemisia tridentata*, *Rosa woodsii*, *Ribes* spp., and *Amelanchier* spp.

*Maximum Tree Size Class*  
Seedling <4.5ft

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:OPN | 0 | Mid1:OPN | 2 |
| Mid1:OPN | 3 | Late1:OPN | 22 |
| Late1:OPN | 23 | 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 | 0.0118 | 85 | Yes | 0 |
| Replacement Fire | Mid1:OPN | Early1:OPN | 0.0118 | 85 | Yes | 0 |
| Replacement Fire | Late1:OPN | Early1:OPN | 0.0118 | 85 | Yes | 0 |

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