10110

Rocky Mountain Aspen Forest and Woodland

BpS Model/Description Version: Aug. 2020

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

Forest and Woodland

Map Zones

22

Geographic Range

For MZ22, this BpS can likely occur in every section.

Great Basin and throughout the western US on drier, higher sites. This is typically found in NV, UT, CA, AZ, NM, CO, ID, WY, MT and eastern OR.

Biophysical Site Description

This type occurs on flat to moderately steep terrain (<50% slope) on all aspects. Elevation ranges from 1,400-2,750m. Soils are highly variable by cool and moist relative to surrounding vegetation. This type occurs above the juniper and/or sagebrush but below the spruce-fir. This occurs in a mosaic with mountain big sagebrush too. Soils are generally deep, mollic and moist. Bare ground does not exceed two percent of soil surface cover.

Vegetation Description

As a species, aspen is adapted to a much broader range of environments than most plants found associated with it. This ecological system occurs commonly as multi-storied stands. Stands are usually closed. Aspen suckers 5-15ft tall will be present in all classes (min. 500 stems/acre). Conifers are usually absent in this type. Where it is adjacent to conifer an occasional conifer seedling may occur, but conifers do not drive the fire regime. Stable upland aspen typically occurs above juniper and adjacent to mountain big sagebrush. Stable aspen is associated with sites too dry to support conifers and may be surrounded by small acreages of sagebrush. Stable aspen is found both on dry sites and in more mesic areas where fir species are largely absent. Understory consists of abundant herbaceous and shrub components. Commonly species of tall forbs, perennial grasses and shrubs are found in the understory. Common shrubs include: *Salix scouleriana*, *Acer glabrum*, *Amelanchier alnifolia*, *Artemisia tridentata*, *Juniperus communis*, *Prunus virginiana*, *Rosa woodsii*, *Shepherdia canadensis*, *Symphoricarpos oreophilus*, and the dwarf-shrubs *Mahonia repens*. The herbaceous layers may be lush and diverse. Common graminoids may include: *Bromus anomalus*, *Carex siccata* (=*Carex foenea*), *Carex geyeri*, *Carex rossii*, *Elymus glaucus*, *Nassella viridula*, and *Melica bulbosa*. Associated forbs may include *Ligusticum porteri*, *Eucephalus engelmannii* (=*Aster engelmannii*), *Delphinium* spp., *Geranium viscosissimum*, *Heracleum sphondylium*, *Ligusticum filicinum*, *Lupinus argenteus*, *Osmorhiza depauperata*, *Arnica cordifolia*, *Pteridium aquilinum*, *Rudbeckia occidentalis*, *Thalictrum fendleri*, *Valeriana occidentalis*, *Wyethia amplexicaulis*, and many others.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| POTR5 | *Populus tremuloides* | Quaking aspen |
| SASC | *Salix scouleriana* | Scouler's willow |
| BRAN | *Bromus anomalus* | Nodding brome |
| ELGL | *Elymus glaucus* | Blue wildrye |
| LIPO | *Ligusticum porteri* | Porter's licorice-root |

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

Disturbance Description

Baker (1925) offers the best description of the pre-settlement condition.

Insects/diseases are prevalent. Disease is major disturbance - but unsure of return interval. The probabilities for insect/disease outbreaks in the older development state has potentially a large effect on the model, especially the transition from classes C to B.

Romme et al (2001) states fire return interval is 140yrs. Note that fire return intervals for this MZ22 are modeled at longer intervals than in a few other mapzones (19,10,18 and 23), but multiple experts in this mapzone, as well as in MZs 20 and 21 and elsewhere felt that this longer interval was much more appropriate than a shorter interval.

Disturbance effects would also have varied from clone to clone. Many aspen clones situated on steep slopes are prone to disturbance caused by avalanches and mud/rock slides.

Native herbivory is another major disturbance. No data available on reference condition frequency. In the reference state the density of ungulates was low due to efficient Native American hunting and predator prey cycles, so the impacts of ungulates were low. Herbivory was therefore not included in the model. It is thought that herbivore impacts would have been high at some periods and low at others, and that a single level would not persist for long. However, information on pre-settlement herbivory is lacking.

Secondary disturbances may include: snow, mudslides and rotational slumping, but not modeled.

Severe drought can take class A to sagebrush.

These are typically self-perpetuating stands. While not dependent upon disturbance to regenerate, aspen was adapted to a diverse array of disturbances. For example, there are ground fires which burn small areas throughout these stands. These fires do not set succession back.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 165 | 100 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 165 | 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

Patch size for this type ranges from less than 10ac to 1,000s of acres. Average size for MZ22 patches could be toward smaller end of range.

Adjacency or Identification Concerns

This could be adjacent to or confused with Northern Rockies Mountain Lower Montane-Foothill Deciduous shrubland BpS type 1106.

Sagebrush groups, especially mountain big sagebrush occur below and in places, around this group.

Lack of suckers is representative of an uncharacteristic class. Another uncharacteristic class is indicated where sagebrush and rabbitbrush cover is over 10%. Exotic grasses such as the perennials *Poa pratensis* and dandelions are often common in occurrences disturbed by grazing. Localized impacts around stock ponds in stands.

Aspen decline varies across the region. Declines have been documented in WY.

Large grazing ungulates are currently impacting many stands throughout the western United States.

Under current conditions, herbivory can significantly affect stand succession. Kay (1997, 2001a, b and c) found the impacts of burning on aspen stands were overshadowed by the impacts of herbivory. In the reference state the density of ungulates was low due to efficient Native American hunting and predator prey cycles, so the impacts of ungulates were low.

Issues or Problems

No historical information on native grazing, disease frequency.

Aspen stands tend to remain dense throughout most of their life-span, hence the open stand descriptions were not used.

Native Uncharacteristic Conditions

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 | A | A | A | A | A | A | A |
| Herb | 0.5-1.0 | A | A | A | A | A | A | A | A | A | A |
| Herb | >1.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 0-0.5 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 0.5-1.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 1.0-3.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | >3.0 | A | A | A | A | A | A | A | A | A | A |
| Tree | 0-5 | A | A | A | A | A | A | A | A | A | A |
| Tree | 5-10 | B | B | B | B | B | B | B | B | B | B |
| Tree | 10-25 | C | C | C | C | C | C | C | C | C | C |
| Tree | 25-50 | C | C | C | C | C | C | C | C | C | C |
| Tree | >50 | C | C | C | C | C | C | C | C | C | C |

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 8 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| POTR5 | Populus tremuloides | Quaking aspen | Upper |

Description

Aspen suckers and saplings. Grass and forbs present.

*Maximum Tree Size Class*  
Sapling >4.5ft; <5"DBH

Class B 34 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| POTR5 | Populus tremuloides | Quaking aspen | Upper |

Description

Aspen over five meters tall dominate. Dense, pole-size tree in this class.

*Maximum Tree Size Class*  
Pole 5-9" DBH

Class C 58 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| POTR5 | Populus tremuloides | Quaking aspen | Upper |
| JUCO6 | Juniperus communis | Common juniper | Lower |
| SYOR2 | Symphoricarpos oreophilus | Mountain snowberry | Lower |

Description

Aspen over 15m tall. More shrubs and forbs.

*Maximum Tree Size Class*  
Medium 9-21"DBH

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:CLS | 10 |
| Mid1:CLS | 11 | Late1:CLS | 60 |
| Late1:CLS | 61 | 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** |
| Native Grazing | Early1:ALL | Early1:ALL | 0.002 | 500 | Yes | 0 |
| Replacement Fire | Early1:ALL | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Insects or Disease | Late1:CLS | Early1:ALL | 0.0035 | 286 | Yes | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.007 | 143 | Yes | 0 |

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