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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

27

Geographic Range

This system occurs in western CO, UT, northern NM, northern AZ and central NV. In MZ27 in NM, this type is thought to occur only in limited quantities, particularly on mild to moderate slopes of the Manzano, Manzanita and Sandia ranges. Within MZ27 in NM, it should occur in ECOMAP (Cleland et al. 2007) section M313 - very top of Manzanas and Sandillas.

Biophysical Site Description

This type occurs on flat to moderately steep terrain (<50%) on all aspects. Elevation typically ranges from 2,275-2,700m. Annual precipitation is 56-68cm. Stable aspen typically occurs above grass, sagebrush or pinyon-juniper (PJ). Soils are generally deep, mollic, cool and moist. As a species, aspen is adapted to a much broader range of environments than most plants found associated with it. Soils are generally deep and moderately deep and are derived from colluvium and residuum. Soils commonly have frigid (cool) temperature and udic (moist) moisture regimes with fairly thick organic surface horizons. Mollic or borderline Mollic epipedons are common.

Vegetation Description

Aspen exists in single-storied or more commonly multi-storied stands. Mature conifers are rare in this type. Multi-storied (multi-aged) conditions are typical of stand dynamics in stable aspen, where regeneration occurs on much smaller scales (than seral aspen in aspen-mixed conifer stands).

Understory consists of an abundant herbaceous component, perhaps with snowberry (*Symphoricarpos* spp), meadow rue (*Thalictrum fendleri*), *Arctostaphylos uva-ursi* and/or yarrow (*Achillea millefolium*) present.

Aspen suckers 5-15ft tall will be present in all classes at least 500 stems/acre. Lack of suckers is representative of an uncharacteristic class.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| POTR5 | *Populus tremuloides* | Quaking aspen |
| SYOR2 | *Symphoricarpos oreophilus* | Mountain snowberry |
| ARUV | *Arctostaphylos uva-ursi* | Kinnikinnick |

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

Disturbance Description

Fire, insects and disease occur.

Aspen may persist in the absence of disturbance (contrary to NatureServe (NS) description). Stand replacement fire generally spreads from adjacent systems and provides a significant means of aspen reproduction. Surface fire generally spreads from the margins of aspen stands as a result of fire on adjacent vegetation types. Mixed severity fire is undocumented. One reviewer stated that drought may have altered fire behavior in aspen in recent years. He observed aspen stands burn in a mixed severity fire on the Encebado Fire in Taos. Similar observations have been made by other firefighters, but literature supporting recent burning in aspen is lacking at this time.

Native grazing on seedlings has impacts particularly in class A. Currently native grazing has reduced aspen regeneration in northern AZ and NM in most places.

Heart rot, as a result of fungus, is common in aspen, affecting individual mature trees. Insect defoliators can affect entire stands, as seen recently in drought-stressed stands.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 146 | 79 | 50 | 300 |
| Moderate (Mixed) | 1707 | 7 |  |  |
| Low (Surface) | 835 | 14 |  |  |
| All Fires | 116 | 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 sizes range in the 10s-100s of acres. Fires may have been as large as thousands of acres, but patches of this system would have typically been smaller than thousands of acres.

Adjacency or Identification Concerns

If conifers are present, please review an aspen mixed conifer BpS instead. Stable stands appear to occur more often at lower elevations compared to seral stands. Adjacent forest types such as ponderosa pine (1054), warm/dry mixed conifer (BpS 1051) or aspen-mixed conifer (BpS 1061) with more frequent fire played a role in the fire frequency of stable aspen stands and the subsequent regeneration. Aspen trees in aspen-mixed conifer stands, on the other hand, were a seral component requiring intermittent and severe fire to maintain their abundance. These stands can be differentiated by distinct even-agedness and the presence of conifers.

Adjacent systems include sagebrush/grass (lower elevation) and mixed conifers (higher elevation).

Issues or Problems

Aspen decline does not appear to be the same across the region. Decline is thought to be critical in UT, AZ, NM, but not in CO (especially southwest CO).

Aspen stands tend to remain dense through much of the lifespan, hence the open stand descriptions were not used and "woodland" may be something of a misnomer. As aspen is such a wide-ranging species, there are not characteristic understory species which assist in identification of this type.

Native Uncharacteristic Conditions

Lack of aspen suckers is representative of an uncharacteristic class. Less than 30% cover of aspen in the mid- and late-development conditions can be considered uncharacteristic. In contemporary stands, these conditions are typically due to native or non-native herbivory.

Comments

This model for MZ27 was adopted from the same BpS from MZ25. No major changes were made to the model or description for MZ27 so modelership from previous mapzones was retained.

The model for MZ25 was imported from the same BpS from MZ15 created by Mike Manthei, Linda Wadleigh and Rory Steinke and reviewed by Steinke and Chad Stewart.

Model from MZ15 is based on the model from MZ28 for the same BpS.

The model from MZ28 was modified in the Flagstaff workshop with additional modelers, Jack Triepke, jtriepke@fs.fed.us; Ed Smith, esmith@tnc.org; and Deb Bumpus, bdumpus@fs.fed.us.

The model from MZ28 was based on the Rapid Assessment model R3ASPN by L. Chappell (lchappell@fs.fed.us), R. Wu (rwu@fs.fed.us) and K. Ryan (kryan@fs.fed.us) and reviewed by Bill Baker (bakerwl@wyo.edu). It was further modified in a workshop in Denver 4/27/2005 by E. Biery, L Duran, F. Escoban, L. Kerr, D Knight, D. Toelle, B. Wilmore and an anonymous contributor.

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 | UN | UN | UN | B | B | B | B | B | B | B |
| Tree | 10-25 | UN | UN | UN | C | C | C | C | C | C | C |
| Tree | 25-50 | UN | UN | UN | C | C | C | C | C | C | C |
| Tree | >50 | UN | UN | UN | 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 6 Early Development 1 - All Structures

Indicator Species

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

Description

Aspen suckers less than six feet tall, often less than one inch DBH, and abundant. Grass and forbs resprout vigorously with high cover. Often densely vegetated.

*Maximum Tree Size Class*  
Seedling <4.5ft

Class B 35 Mid Development 1 - Closed

Indicator Species

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

Description

Aspen over six feet tall dominate. Canopy cover highly variable, but usually dense. Understory also usually dense.

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

Class C 59 Late Development 1 - All Structures

Indicator Species

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

Description

Aspen trees nine inches plus DBH. Canopy cover is highly variable, but usually dense. Understory dense. Lots of dead and downed material.

Although this model shows a plurality of older aged stands, the stands are often uneven aged. On the ground, the multi-aged nature of these stands should be noted.

*Maximum Tree Size Class*  
Large 21-33"DBH

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:CLS | 9 |
| Mid1:CLS | 10 | Late1:ALL | 69 |
| Late1:ALL | 70 | Late1:ALL | 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 | 0.005 | 200 | Yes | 0 |
| Native Grazing | Early1:ALL | Early1:ALL | 0.2 | 5 | No | 0 |
| Insects or Disease | Mid1:CLS | Mid1:CLS | 0.002 | 500 | No | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.007 | 143 | Yes | 0 |
| Mixed Fire | Late1:ALL | Early1:ALL | 0.001 | 1000 | Yes | 0 |
| Surface Fire | Late1:ALL | Late1:ALL | 0.002 | 500 | No | 0 |
| Insects or Disease | Late1:ALL | Late1:ALL | 0.002 | 500 | No | 0 |
| Wind or Weather or Stress | Late1:ALL | Late1:ALL | 0.005 | 200 | No | 0 |
| Replacement Fire | Late1:ALL | Early1:ALL | 0.007 | 143 | Yes | 0 |

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