11540

Inter-Mountain Basins Montane Riparian Systems

BpS Model/Description Version: Aug. 2020

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| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
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| None | None | None | None |
| None | None | None | None |

Vegetation Type

Woody Wetland

Map Zones

1, 7, 8, 9

Geographic Range

Eastern OR and WA. Includes both Columbia Basin Foothill Riparian Woodlands and Shrublands and Great Basin Foothill Riparian Woodlands and Shrublands.

Biophysical Site Description

This ecological system is found within a broad elevation range from about 600m (2,000ft) to over 1,500m (5,000ft). These woodlands and shrublands require periodic flooding and bare, moist substrates for reestablishment. They are found in low-elevation canyons and draws, on floodplains, or in steep-sided canyons, or narrow V-shaped valleys with rocky substrates. Sites are subject to temporary flooding during spring runoff. Underlying gravels may keep the water table just below ground surface, and are favored substrates for cottonwood. Large bottomlands may have occurred in large patches, but most have been cut over or cleared for agriculture, principally grazing and hay production. Rafted ice and logs in freshets may cause considerable damage to tree boles. Beavers crop younger cottonwood and willows in the smaller waterways, and frequently dam side channels occurring in these stands. In steep-sided canyons, perennial streams typically have mid to high gradients. The surface is flooded during spring runoff and remains saturated for variable periods. Soils are typically alluvial deposits of sand, clays, silts and cobbles that are highly stratified with depth due to flood scour and deposition

Vegetation Description

This ecological system occurs as a mosaic of multiple communities that are tree dominated with a diverse shrub component. In eastern OR, dominant trees may include *Betula occidentalis*, *Populus balsamifera* ssp*. trichocarpa*, and *Populus tremuloides*. Dominant shrubs include *Cornus sericea*, *Salix* spp, *Symphoricarpos albus*, *Alnus incana*, *Rosa* spp and *Crataegus* spp. Herbaceous layers are often dominated by species of *Carex* and *Juncus*, and perennial grasses and mesic forbs such *Glyceria* spp, *Iris missouriensis*, *Equisetum arvense*, or *Algelica* spp. In eastern OR, important and diagnostic trees include *Populus balsamifera* ssp. *trichocarpa*, *Alnus rhombifolia*, *Populus tremuloides*, *Celtis laevigata* var. *reticulata*, and *Betula occidentalis*. Important shrubs include *Crataegus douglasii*, *Philadelphus lewisii*, *Cornus sericea*, *Salix lucida* ssp. *lasiandra*, *Salix eriocephala*, *Rosa nutkana*, *Rosa woodsii*, *Amelanchier alnifolia*, *Prunus virginiana*, and *Symphoricarpos albus*.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| POPUL | *Populus* | Cottonwood |
| SALIX | *Salix* | Willow |
| ALNUS | *Alnus* | Alder |
| BETUL | *Betula* | Birch |
| CORNU | *Cornus* | Dogwood |

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

Disturbance Description

These are disturbance-driven systems that require flooding, scour and deposition for germination and maintenance. This system is dependent on a natural hydologic regime, especially annual to episodic flooding with flooding of increasing magnitude causing more stand replacement events. Beaver (*Castor canadensis*) crop younger cottonwoods (*Populus* spp), aspen (*Populus tremuloides*) and willows (*Salix* spp), and frequently influence the hydrologic regime through construction of dams, etc. Beaver will move from areas where tree availability is depleted. Fire disturbances occur, but are infrequent catastrophic events.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 98 | 100 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 98 | 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

This system can exist as small to large linear features in the landscape (eg, lower Deschutes, John Day, Okanogan and Methow Rivers). In larger, low-elevation riverine systems, this system may exist as mid to large size patches.

Adjacency or Identification Concerns

Livestock grazing is a major influence in the alteration of structure, composition and function of the community. Livestock grazing can result in the nearly complete removal of willow and cottonwood regeneration, and bank slumping in places where water is accessible.

The exotic tree, *Elaeagnus angustifolia*, is common in some stands. Introduced forage species such as *Agrostis stolonifera*, *Poa pratensis*, *Phleum pretense*, and *Bromus tectorum* (a weedy annual on the driest xero-riparian sites) are often present in disturbed stands.

Issues or Problems

Native Uncharacteristic Conditions

Comments

MZs 1, 7, 8 and 9 were combined during 2015 BpS Review.

This model is a revised Intermountain Basins Montane Riparian Systems (BpS 1154). It is defined as deciduous hardwood trees and shrubs with a mosaic of herbaceous types in a small scale linear riparian system from low to mid-elevations. Conifer-dominated stream and river terraces are excluded due to the degree of hydrologic influence and fire frequencies in ponderosa pine systems.

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 | B | B | B | B | B | B | B | B | B | B |
| 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 28 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| POPUL | Populus | Cottonwood | Upper |
| SALIX | Salix | Willow | Upper |
| ALNUS | Alnus | Alder | Upper |
| CAREX | Carex | Sedge | Lower |

Description

Immediate post-disturbance responses are dependent on pre-burn vegetation composition. Typically shrub dominated, but grasses and sedges may co-dominate. Deciduous trees can establish (resprout/germinants) and be a minor component of main canopy Silt, gravel, cobble and woody debris may be common. Composition highly variable.

Ten, hundred and thousand year flood events occur in this class, but because all maintain vegetation in class A the probabilities were combined into a single wind/weather/stress transition with a probability of .111 (.1 + .01 + .001).

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

Class B 63 Mid Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| POPUL | Populus | Cottonwood | Upper |
| ALNUS | Alnus | Alder | Upper |
| SALIX | Salix | Willow | Mid-Upper |

Description

Highly dependent on the hydrologic regime. Vegetation composition includes tall shrubs and small trees (cottonwood, aspen).

Floods that resulted in a transition to class A were combined in the VDDT model (probability = .011). Floods that resulted in maintenance in class B were combined in the VDDT model (probability = .1).

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

Class C 9 Late Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| POPUL | Populus | Cottonwood | Upper |
| ALNUS | Alnus | Alder | Mid-Upper |
| SALIX | Salix | Willow | Mid-Upper |

Description

This class represents the mature, large cottonwood, aspen, etc. woodlands.

*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:ALL | 14 |
| Mid1:ALL | 15 | Late1:ALL | 49 |
| Late1:ALL | 50 | 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** |
| Optional 1 | Early1:ALL | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Replacement Fire | Early1:ALL | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Wind or Weather or Stress | Early1:ALL | Early1:ALL | 0.111 | 9 | No | 0 |
| Optional 1 | Mid1:ALL | Mid1:ALL | 0.005 | 200 | No | 0 |
| Optional 1 | Mid1:ALL | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Replacement Fire | Mid1:ALL | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Wind or Weather or Stress | Mid1:ALL | Early1:ALL | 0.011 | 91 | Yes | 0 |
| Wind or Weather or Stress | Mid1:ALL | Mid1:ALL | 0.1 | 10 | No | 0 |
| Wind or Weather or Stress | Late1:ALL | Early1:ALL | 0.0005 | 2000 | Yes | 0 |
| Optional 1 | Late1:ALL | Mid1:ALL | 0.001 | 1000 | Yes | 0 |
| Wind or Weather or Stress | Late1:ALL | Late1:ALL | 0.005 | 200 | No | 0 |
| Optional 1 | Late1:ALL | Late1:ALL | 0.009 | 111 | No | 0 |
| Replacement Fire | Late1:ALL | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Wind or Weather or Stress | Late1:ALL | Mid1:ALL | 0.106 | 9 | Yes | 0 |

Optional Disturbances

Optional 1: Beaver

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