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

6, 12, 16, 17

Geographic Range

Great Basin, eastern slopes of the Sierra Nevada of California, Columbia Plateau, and western edge of Northern Rockies

Biophysical Site Description

This ecological system is found within a broad elevation range -- from about 1,220m (4,000ft) to >2,135m (>7,000ft). These forests and woodlands require flooding and some gravels 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 occurrences, but most have been cut or cleared for agriculture. Rafted ice and logs in freshets may cause considerable damage to tree boles. Beaver crop younger cottonwood and willow, and frequently dam side channels occurring in these stands. In steep-sided canyons, streams typically have perennial flow in mid to high gradients. Surface water is generally high 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 the Great Basin and eastern Sierra Nevada, dominant trees may include *Abies concolor*, *Alnus incana*, *Betula occidentalis*, *Populus angustifolia*, *Populus balsamifera* ssp*. trichocarpa*, *Populus fremontii*, *Salix laevigata*,and *Salix gooddingii*. Dominant shrubs include *Artemisia cana*, *Cornus sericea*, *Salix exigua*, *Salix lasiolepis*, *Salix lemmonii*,or *Salix lutea*. Herbaceous layers are often dominated by species of *Carex* and *Juncus*, and perennial grasses and mesic forbs such *Deschampsia caespitosa*, *Elymus trachycaulus*, *Glyceria striata*, *Iris missouriensis*, *Maianthemum stellatum*,or *Thalictrum fendleri*. In the Columbia Plateau section, important and diagnostic trees include *Populus balsamifera* ssp*. trichocarpa*, *Alnus rhombifolia*, *Populus tremuloides*, *Celtis laevigata* var*. reticulata*, *Betula occidentalis*,or *Pinus ponderosa*. 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 |

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 hydrologic regime, especially annual to episodic flooding, with flooding of increasing magnitude causing more stand-replacement events. Beaver (*Castor canadensis*) crop younger cottonwood (*Populus* spp.) and willow (*Salix* spp.), and frequently influence the hydrologic regime through construction of dams, etc. Beaver 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 | 378 | 100 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 378 | 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 (e.g., lower Truckee, Carson, Walker, and Humboldt rivers). In larger, low-elevation riverine systems, this system may exist as mid to large patches.

Adjacency or Identification Concerns

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

Exotic trees of *Elaeagnus angustifolia* and *Tamarix* spp. are common in some stands. Introduced forage species such as *Agrostis stolonifera*, *Poa pratensis*, *Phleum pratense*, and the weedy annual *Bromus tectorum* are often present in disturbed stands.

Issues or Problems

Native Uncharacteristic Conditions

Comments

Map zones 6, 12, 16, and 17 were combined during 2015 Biophysical Setting (BpS) Review.

This model attempts to combine the Columbia Basin Foothill and Lower Montane Riparian woodland and shrubland (CES304.768) and Great Basin Foothill and Lower Montane Riparian woodland and shrubland (CES304.045). This model is similar to BpS 1159, with only slight modifications to vegetation species composition because BpSs 1154 and 1159 overlap in elevation and describe the lower part of meandering river systems of the Great Basin.

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 | B | B | B | B | B | B | B | B | B |
| Shrub | >3.0 | A | B | B | B | B | B | B | B | B | B |
| Tree | 0-5 | C | C | C | C | C | C | C | C | C | C |
| Tree | 5-10 | C | C | C | C | C | C | C | C | C | C |
| 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 22 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 grass may co-dominate. Silt, gravel, cobble, and woody debris may be common. Composition highly variable.

*Maximum Tree Size Class*  
None

Class B 51 Mid Development 1 - Open

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, and conifer).

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

Class C 27 Late Development 1 - Closed

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 mature, large cottonwood; conifer; 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:OPN | 4 |
| Mid1:OPN | 5 | Late1:CLS | 49 |
| Late1:CLS | 50 | 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** |
| Wind or Weather or Stress | Early1:ALL | Early1:ALL | 0.1 | 10 | Yes | 0 |
| Optional 1 | Early1:ALL | Early1:ALL | 0.2 | 5 | Yes | 0 |
| Wind or Weather or Stress | Mid1:OPN | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Optional 1 | Mid1:OPN | Mid1:OPN | 0.025 | 40 | No | 0 |
| Optional 1 | Mid1:OPN | Early1:ALL | 0.025 | 40 | Yes | 0 |
| Wind or Weather or Stress | Mid1:OPN | Mid1:OPN | 0.2 | 5 | No | 0 |
| Optional 1 | Late1:CLS | Mid1:OPN | 0.001 | 1000 | Yes | 0 |
| Wind or Weather or Stress | Late1:CLS | Early1:ALL | 0.001 | 1000 | Yes | 0 |
| Wind or Weather or Stress | Late1:CLS | Mid1:OPN | 0.005 | 200 | Yes | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.01 | 100 | Yes | 0 |

Optional Disturbances

Optional 1: Beaver

References

Barbour, M.G. and W.D. Billings, editors. 1988. North American terrestrial vegetation. Cambridge University Press, New York. 434 pp.

Barbour, M.G. and J. Major, editors. 1977. Terrestrial vegetation of California. John Wiley and Sons, New York. 1002 pp.

Johnson, C.G. and S.A. Simon. 1985. Plant associations of the Wallowa Valley Ranger District, Part II: Steppe. USDA Forest Service, Pacific Northwest Region, Wallowa-Whitman National Forest. 258 pp.

Manning, M.E. and W.G. Padgett. 1995. Riparian community type classification for Humboldt and Toiyabe National Forests, Nevada and eastern California. USDA Forest Service, Intermountain Region. 306 pp.

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

Sawyer, J.O. and T. Keeler-Wolf. 1995. A manual of California vegetation. California Native Plant Society, Sacramento. 471 pp.