11540

Inter-Mountain Basins Montane Riparian Systems

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Woody Wetland

Map Zone

13

Geographic Range

Great Basin, eastern slopes of the Sierra Nevada of California, Columbia Plateau, western edge of northern Rockies, and mountains of the central and western Mojave Desert.

Biophysical Site Description

This ecological system is found within a broad elevation range from ~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- to mid-elevation canyons and draws, on floodplains, in steep-sided canyons, or in 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 and willow. In steep-sided canyons, streams typically have perennial flow on 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 may be tree- or shrub-dominated. Dominant trees may include *Abies concolor*, *Juniperus scopulorum*, *Betula occidentalis*, *Populus angustifolia*, *Populus balsamifera* ssp. *trichocarpa*, *Populus fremontii*, *Salix laevigata*, and *Salix gooddingii*. Dominant shrubs include *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 as *Deschampsia caespitosa*, *Elymus trachycaulus*, *Glyceria striata*, *Maianthemum stellatum*, or *Thalictrum fendleri*. Important shrubs include *Rosa woodsii*, *Amelanchier alnifolia*, and *Prunus virginiana*.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| POPUL | *Populus* | Cottonwood |
| SALIX | *Salix* | Willow |
| ROWO | *Rosa woodsii* | Woods' rose |
| BETUL | *Betula* | Birch |
| ABCO | *Abies concolor* | White fir |
| JUSC2 | *Juniperus scopulorum* | Rocky mountain juniper |

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 as the stand ages. Beaver (*Castor canadensis*) are not present in this Biophysical Setting (BpS) for the Mojave Desert.

Although fuel is continuous and abundant, it is high in moisture but dries out during the summer. Therefore, replacement fire sweeps through BpS 131154 and is caused by importation from adjacent systems that may include basin big sagebrush, southern ponderosa pine woodlands, black sagebrush, and other types. Native American burning was somewhat present in these Great Basin montane riparian systems, but camps were generally located at the mouth of canyons (Kay Fowler from University of Nevada, Reno, personal communications, September 2005). The fire regime is dominated by replacement fire.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 68 | 100 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 68 | 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 medium linear features in the landscape. 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 pretense*, and the weedy annual *Bromus tectorum* are often present in disturbed stands.

Issues or Problems

Native Uncharacteristic Conditions

Tree cover can reach 100% in the pre-settlement condition; <30% tree cover (remote sensing) considered uncharacteristic.

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 | 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 26 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| POPUL | Populus | Cottonwood | Upper |
| SALIX | Salix | Willow | Upper |
| ROWO | Rosa woodsii | Woods' rose | Upper |
| CAREX | Carex | Sedge | Lower |

Description

Immediate post-disturbance responses are dependent on pre-disturbance vegetation composition. Generally, this class is expected to occur 1-5yrs post-disturbance. Typically shrub-dominated, but grass may co-dominate. *Salix* spp. dominates after fire, whereas *Populus* spp. and *Salix* spp. co-dominate after flooding. Silt, gravel, cobble, and woody debris may be common. Composition highly variable.

*Maximum Tree Size Class*  
None

Class B 53 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| POPUL | Populus | Cottonwood | Upper |
| ROWO | Rosa woodsii | Woods' rose | Upper |
| SALIX | Salix | Willow | Mid-Upper |

Description

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

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

Class C 21 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| POPUL | Populus | Cottonwood | Upper |
| ROWO | Rosa woodsii | Woods' rose | Mid-Upper |
| SALIX | Salix | Willow | Mid-Upper |

Description

This class represents mature, large cottonwood, conifer, etc., woodlands. Flooding events (weather-related stress) cause a transition.

*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 | 19 |
| Late1:CLS | 20 | 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 | 0.13 | 8 | Yes | 0 |
| Replacement Fire | Mid1:OPN | Early1:ALL | 0.02 | 50 | Yes | 0 |
| Wind or Weather or Stress | Mid1:OPN | Early1:ALL | 0.05 | 20 | Yes | 0 |
| Wind or Weather or Stress | Mid1:OPN | Mid1:OPN | 0.2 | 5 | No | 0 |
| Wind or Weather or Stress | Late1:CLS | Early1:ALL | 0.02 | 50 | Yes | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.02 | 50 | Yes | 0 |
| Wind or Weather or Stress | Late1:CLS | Mid1:OPN | 0.05 | 20 | Yes | 0 |

References

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