11590

Rocky Mountain Montane Riparian Systems

BpS Model/Description Version: Aug. 2020

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

Vegetation Type

Woody Wetland

Map Zones

27, 33

Geographic Range

Great Basin, California, northern Rockies, Alaska, Pacific Northwest, and north-central regions. For map zone (MZ) 27, this system is thought to occur only on the western edge.

Biophysical Site Description

This ecological system represents the combination of numerous riparian types occurring in the montane zone. The system exists as relatively small, linear stringers in the fire management landscape.

Vegetation Description

This ecological system encompasses a broad array of riparian species. These systems are highly variable and generally consist of one or more of the following five basic vegetation forms: (1) cottonwoods, (2) willow, (3) sedges and other herbaceous vegetation, (4) aspen, and (5) conifer (primarily spruce and subalpine fir).

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| POPUL | *Populus* | Cottonwood |
| SALIX | *Salix* | Willow |
| POTR5 | *Populus tremuloides* | Quaking aspen |
| CAREX | *Carex* | Sedge |
| ABLA | *Abies lasiocarpa* | Subalpine fir |
| PICEA | *Picea* | Spruce |

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

Disturbance Description

The moisture associated with riparian areas promotes lower fire frequency compared to adjacent uplands, and rapid recovery from fire events. Wet-meadow types seldom burn. In riparian systems, the pre-burn herbaceous plant community is not permanently destroyed and it recovers rapidly. Recovery is possible within a single growing season. Woody species (i.e., aspen, *Salix* spp., and occasionally cottonwood species) can be top-killed, but generally resprout within a short period. In systems with conifers, post-fire establishment is from seed. Hydrologic events are the major disturbance agents in these systems. In addition, beaver (*Castor canadensis*) were historically important in many of these systems. Older vegetation experienced fire when replacement fire burned the uplands (mean fire return interval [MFRI], 100yrs). Surface fire (MFRI, 50yrs) affected the Early Development class through a combination of replacement fire from uplands and occasional native burning. Insects may also affect cottonwood.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 274 | 23 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) | 80 | 77 |  |  |
| All Fires | 62 | 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

These systems are small, linear features in the landscape.

Adjacency or Identification Concerns

This type is very similar to Rocky Mountain Upper Montane/Subalpine Riparian Systems (Biophysical Setting [BpS] 161160), and the VDDT models are identical. Overgrazing and irrigation use have had major impacts on some of these systems.

Issues or Problems

This ecological system occurs at scales below 30m resolution of LANDFIRE. There is a paucity of information on this system.

Native Uncharacteristic Conditions

Comments

This model for MZ27 was adopted as-is from the same BpS in MZ25 (reviewed by Tim Christiansen). For MZ27, no review was obtained due to non-interest of modelers and reviewers. Only changes made were to abide by LANDFIRE mapping rules and the drop-down boxes.

This model for MZ25 is identical to the model for the same BpS in MZ16 (Utah High Plateaus) and did not receive any peer review for MZs 23 and 24. Original modelers: Charles Kay and Don Major.

Fire behavior in these systems is strongly influenced by the adjacent uplands. Hydrologic processes (e.g., flooding) are the determining factors in these 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 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | 0.5-1.0 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | 1.0-3.0 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | >3.0 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 0-5 | B | B | B | B | UN | UN | UN | UN | UN | UN |
| Tree | 5-10 | B | B | B | B | UN | UN | UN | UN | UN | UN |
| Tree | 10-25 | B | B | B | B | UN | UN | UN | UN | UN | UN |
| Tree | 25-50 | B | B | B | B | UN | UN | UN | UN | UN | UN |
| Tree | >50 | B | B | B | B | UN | UN | UN | UN | UN | UN |

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 63 Early Development 1 - All Structures

Upper Layer Lifeform Is Not the Dominant Lifeform

The dominant lifeform may vary between shrubs and herbaceous vegetation. The herbaceous layer may range in cover from 0-100% and in height from short (<0.5m) to tall (>1m). Cover was originally modeled as shrub 0-10%, 0m-3m; however, due to mapping rules, this was changed to an herbaceous box.

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| POPUL | Populus | Cottonwood | Upper |
| SALIX | Salix | Willow | Upper |
| CAREX | Carex | Sedge | Upper |
| PICEA | Picea | Spruce | Upper |

Description

Early-Seral class dominated by shrub or grass. Immediate post-fire responses in this ecological system are dependent on pre-burn vegetation form; composition varies within stream reach. In general, this class is expected to last several years post-disturbance. Replacement fire was typically rare and not included. Surface fire was more frequent and a combination of upland-driven fire and native burning. Beaver removed woody vegetation fairly often. Two flooding disturbances were included: frequent flood events that did not cause a change in succession age (i.e., had no ecological setback or delay in succession) and less-frequent flood events that revert the vegetation to the post-replacement stage. The duration of this class is highly variable due to high moisture levels and high species variability.

*Maximum Tree Size Class*  
None

Class B 37 Mid Development 1 - Closed

Upper Layer Lifeform Is Not the Dominant Lifeform

The dominant lifeform may also include trees, but is highly variable. Canopy cover of trees may range from 0-30% and ranges in height from regeneration (<5m) to tall (25m-49m). This was originally modeled as a shrub class with 11-100% cover, 0m-3.1m+. Therefore, shrubs should be included in this class as well.

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| POPUL | Populus | Cottonwood | Upper |
| SALIX | Salix | Willow | Upper |
| CAREX | Carex | Sedge | Upper |
| PICEA | Picea | Spruce | Upper |

Description

The composition of this class is highly dependent on the hydrologic regime. For example, it could include any combination of the five vegetation forms described earlier. Composition of adjacent uplands is the determining factor for future fire events. Furthermore, conifer establishment in these higher elevation areas also influences the MFRI. Therefore, replacement fire was selected to characterize this disturbance.

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

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:CLS | 24 |
| Mid1:CLS | 25 | Mid1: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** |
| Surface Fire | Early1:ALL | Early1:ALL | 0.02 | 50 | No | 0 |
| Optional 2 | Early1:ALL | Early1:ALL | 0.02 | 50 | Yes | 0 |
| Optional 1 | Early1:ALL | Early1:ALL | 0.1 | 10 | Yes | 0 |
| Wind or Weather or Stress | Early1:ALL | Early1:ALL | 0.5 | 2 | No | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.01 | 100 | Yes | 0 |

Optional Disturbances

Optional 1: Beaver

Optional 2: 50-yr flood event

References

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