## Montane Riparian (MRIP)

### General Information

### Cover Type Overview

* 5,445 acres / 2,204 hectares
* Crosswalks
  + EVeg: Regional Dominance Type 1
    - Riparian Mixed Hardwood
    - White Alder
    - Willow
    - Black Cottonwood
    - Willow - Alder
    - Mountain Alder
    - Willow (Shrub)
  + EVeg: Regional Dominance Type 2
    - Any
  + LandFire BpS Model: 0611520 California Montane Riparian Systems

### Vegetation Description

This system often occurs as a highly variable mosaic of multiple communities that are tree-dominated with a diverse shrub component. The variety of plant associations connected to this system reflect elevation, stream gradient, floodplain width, and flooding events. Usually, the montane riparian zone occurs as a narrow, often dense grove of broad-leaved, winter deciduous trees with a sparse understory. At high mountain elevations, there are usually more shrubs in the understory. At high elevations, the type may not be well developed or may occur in the shrub stage only (LandFire 2007, Grenfell 1988).

Characteristic species are many, including those from the following genera: *Acer, Alnus, Cornus, Populus, Rhododendron,* and *Salix*. These habitats can occur as *Alnus* or *Salix* stringers along streams of seeps. In other situations an overstory of *Populus* and/or *Alnus* may be present (Grenfell 1988). Other tree species may include *Pseudotsuga menziesii*, *Platanus racemosa*, and *Quercus agrifolia*. At lower elevations, the riparian areas may contain *Arbutus menziesii*, *Lithocarpus densiflorus*, *Umbellularia californica*, *Cornus*, *Acer* and *Fraxinus*. *Salix* species are common throughout, following a series of species as elevation increases (LandFire 2007).

### Distribution

MRIP is associated with montane lakes, ponds, seeps, bogs and meadows as well as rivers, streams and springs. Water may be permanent or ephemeral. The transition between MRIP and adjacent non-riparian vegetation may be abrupt, especially where the topography is steep. Typically, this vegetation type occurs below 2440 m (8000 ft) (Grenfell 1988).

**Disturbances**

### Wildfire

Fire frequency is reduced in riparian zones relative to adjacent uplands. However, riparian zones are heavily influenced by the fire regime of adjacent landcover types and so are still susceptible to disturbance by wildfire, even frequent and high mortality fires. Streams also act as an inhibitor of fire spread, thus contributing to spatial and temporal diversity of landscapes beyond what their relative area would suggest (Grenfell 1988).

Data on fire return intervals (FRIs) are available from a few review papers. Skinner and Chang (1996) aggregated FRIs from the Sierra Nevada and separated pre-1850 data from overall data. They report median FRIs of 36 years, with a minimum of 7 years and a maximum of 71 yearsThe LandFire model (2007) for this type predicts a mean FRI of 50 years. Replacement fire is predicted to have a mean FRI of 90 years and mixed fire a mean FRI of 115 years. We recalculated these BpS numbers using condition-specific information and using only high and low mortality fire categories, which resulted in an interval of 85 years for high mortality fire, 114 years for low mortality fire, and 49 years for any fire. Van de Water and North found FRIs ranging from 8-42 years with a mean of 17 years, using one method. Under a second method FRIs ranged from 10-87 years, with a mean of 30 years. We combined the BpS methodology with the results from Van de Water and North to derive the values in the table below.

Table 1. Fire return intervals (years) and percentage of high versus low mortality fires.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variant** | **Modifier** | **Fire Severity** | **Mean** | **Min** | **Max** | **% of Fires** |
| MRIP | None | High | 77 | – | – | 41 |
| Low | 53 | – | – | 59 |
| All Fires | 31 | 10 | 87 | 100 |

### Other Disturbance

Other disturbances are not currently modeled, but may, depending on the condition affected and mortality levels, reset patches to early development, maintain existing stages, or shift/accelerate succession to a more open stage.

### Vegetation Condition Classes

We recognize three separate condition classes for MRIP: Early Development (ED), Mid Development (MD), and Late Development (LD). The condition classes described below are based on the classes described in the pertinent LandFire Biophysical Setting model descriptions, which in turn were based on a “5-box” state and transition models describing major successional stages related to fire regime condition classification. According to the Fire Regime Condition Class guidebook, up to five successional classes may be utilized to describe age, size, canopy cover, and vegetation composition, ranging from early seral (post-disturbance) to late seral (such as old growth) (Barrett et al. 2010).

### Early Development (ED)

**Description** Immediate post-disturbance responses are dependent on pre-burn vegetation composition. Typically tree dominated, but shrubs may co-dominate. *Salix* and *Alnus* are common, though overall composition is highly variable (LandFire 2007).

**Succession Transition** In the absence of disturbance, this class will transition to MD after 10 years.

**Wildfire Transition** High mortality wildfire (100% of fires in this condition) recycles the patch through the ED condition. Low mortality wildfire is not modeled for this condition class.

**Mid Development (MD)**

**Description** Highly dependent on the hydrologic regime. Vegetation composition includes tall trees and shrubs. *Salix*, *Populus*, and *Alnus* are common. More susceptible to fire than the early condition (LandFire 2007).

**Succession Transition** After 20 years without a wildfire-triggered transition, this class will succeed to LD.

**Wildfire Transition** High mortality wildfire (44.8% of fires in this condition) recycles the patch through the ED condition. Low mortality wildfire (55.2%) does not effect a change in the MD condition.

**Late Development (LD)**

**Description** This class represents the mature, large *Populus, Alnus*, etc. woodlands (LandFire 2007).

**Succession Transition** In the absence of disturbance, this class will maintain, regardless of soil characteristics.

**Wildfire Transition** High mortality wildfire (50% of fires) recycles the patch through the ED condition. Low mortality wildfire (50%) does not effect a change in the MD condition.

**Condition Classification**

Table 2. Classification of cover condition for MRIP. Diameter at Breast Height (DBH) and Cover From Above (CFA) values taken from EVeg polygons. DBH categories are: null, 0-0.9”, 1-4.9”, 5-9.9”, 10-19.9”, 20-29.9”, 30”+. CFA categories are not used for this condition because there is no “closed” vs. “open” differentiation. Each row in the table below should be read with a boolean AND across each column of a row.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Cover Condition | Overstory Tree  Diameter 1 (DBH) | Overstory Tree  Diameter 2 (DBH) | Total Tree  CFA (%) | Conifer  CFA (%) | Hardwood  CFA (%) |
| Early | Null | any | any | any | any |
| Early | 0-9.9” |  |  |  |  |
| Mid | 10-19.9” | any | any | any | any |
| Late | 20-30”+ | any | any | any | any |

**Draft Model**

(See PDF) Disturbance-Succession model for MRIP.

**References**

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