

# Ecological site group R004BK200CA

## Riparian

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### Key Characteristics

- Not like the previous LRUs – LRU K
- Hydrologically-influenced, flood-dominated riverine
- Riverine, flooding occasional to frequent

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

### Physiography

Riparian forests are a complex interaction of many various physical and biologic factors, including function of valley morphology, physical processes, vegetative legacies, and life history strategies. The watershed geomorphology and physical processes form the basis for understanding the spatial extent of the riparian forests, which includes the valley shape, hillslope processes, fluvial processes, soil processes, and hydrologic processes.

### Climate

The average annual precipitation in this MLRA is 23 to 98 inches (585 to 2,490 millimeters), increasing with elevation inland. Most of the rainfall occurs as low-intensity, Pacific frontal storms. Precipitation is evenly distributed throughout fall, winter, and spring, but summers are dry. Snowfall is rare along the coast, but snow accumulates at the higher elevations directly inland. Fog is a significant variable that defines this MLRA from other similar MLRAs. Summer fog frequency values of greater than 35% are strongly correlated to the extent of coast redwood distribution, which is a primary indicator species in this MLRA. Nighttime fog is approximately twice as common as daytime fog and seasonally, it reaches its peak frequency in early August, with the greatest occurrence of fog from June through September (Johnstone and Dawson 2010). The average annual temperature is 49 to 59 degrees F (10 to 15 degrees C). The freeze-free period averages 300 days and ranges from 230 to 365 days, decreasing inland as elevation increases.

Although this is among the highest rainfall areas in California, hot, dry, offshore summer winds and abrupt coastal mountains in much of LRU K limit fog penetration to the interior

and cause interior mountains to be too dry to support redwoods. This contrasts heavily with LRU I to the north which, although also interior to the coast, has land forms such as northwest to southeast oriented drainages that funnel northwest onshore flow, and much less abrupt coastal mountains which allow frequent fog advances deeper inland.

## **Soil features**

Soil development within alluvial environments is highly variable. Frequent erosional and depositional disturbances from flooding create a complex mosaic of soil conditions in the active floodplain that fundamentally influences vegetation colonization and establishment. Well-drained soil or recently deposited mineral alluvium may be found adjacent to very poorly drained organic soils in abandoned high-flow channels. This variability in soil conditions is a major factor in maintaining the high plant diversity typical of riparian ecological sites.

## **Vegetation dynamics**

Riparian areas represent the low-gradient areas within LRU K that are heavily influenced by fluvial hydrologic processes. This provisional ecological site concept is composed of a variety of different riverine expressions/ecological sites and will require more detailed field investigations in order to refine the site concepts and likely develop several new sites that are correlated to similar geologic structure and processes, hydrologic regimes, and vegetation characteristics. This ecological site concept captures variety of typical riparian vegetation expressions and ranges from mostly herbs and shrubs to shrubs and trees that are found in riverine systems that are primarily smaller streams at the bottom of mountain slopes and terraces. The band of riparian vegetation may be broader or narrower depending on where in the LRU it is found and the valley shape and slope shape surrounding the riverine system. Unlike the conifer-dominated forests of LRU I to the north, these central redwood forests in LRU K are typically more a mixture of conifers and hardwoods, similar to many riparian areas in the adjacent LRU J. Vegetation includes a multi-story canopy of redwood, Douglas-fir, tanoak, bigleaf maple, evergreen shrubs, and various grasses. The near-coastal part of the region that is influenced more by fog has more redwoods and similarities to LRU I to the north, however the drier summers and more limited duration of coastal fog limits the competitive advantage of the coastal redwoods in this LRU. This creates limited areas that remain dominated by coast redwood and a larger portion of the LRU dominated by Douglas-fir and other hardwoods, with some redwoods near the lower parts of the mountain slopes where fog still has some influence or the drainages are narrower and remain cooler in the summers, limiting evapotranspiration losses. Many riparian areas in LRU K are occupied by riparian forests that lack redwood and are instead made up of a mix of hardwoods and Douglas-fir. Some riparian areas are surrounded by open grasslands and oak woodlands. They are generally smaller, higher velocity stream orders, such as Rosgen A or B channels with larger bedding sediments.

The ustic-isomesic soil climate regime of this LRU is mainly at elevations between 500

and 2,000 feet. It is within the zone of moderate marine influence. The fog influence is less pronounced than in the udic moisture regime, but some moisture is added to the soil where the tree canopy causes water to precipitate from the fog. The fog is less dense and does not blanket this zone as frequently as in the wetter zone at the lower elevations. The soils are dry for part of the summer, and there is little variation between summer and winter soil temperatures at a depth of 20 inches. The first continuous north-south range of mountains inland from the coast that reaches 2,000 feet forms an effective barrier to the encroachment of marine air. In some drainageways, such as the Noyo River watershed, this zone extends inland 20 miles or more. In other areas, such as along Elkhorn Ridge 7 miles north of Branscomb, the marine influence stops within 8 miles of the coast.

### Primary Disturbance

Coastal fog and yearly precipitation amounts are also a major factor that defines this ecological site from other riparian ecological sites in other MLRAs and LRUs. Windthrow and wind-breakage are less common during winter storms in this LRU but still can occur and open the canopy creating more diversity in the understory.

The disturbances that drive this ecological site concept are dependent on the type, frequency, predictability, extent, magnitude, and timing of the disturbance. The fluvial processes that are dominant in this riparian ecological site concept include stream power, basal shear stress, channel migration, and sediment deposition. The characteristic vegetation pattern of these higher-gradient valleys is maintained by fluvial disturbances and geomorphology. The amount of force exerted on the channel bed and vegetation growing in the active channel and floodplain during a flood is a product of fluid density, gravitational acceleration, flow depth, and water surface slope.

Due to the drier climate of this LRU, fire is likely to play a significant role in this ESG and other riparian areas throughout LRU K. Fires from lightning, historic cultural burning by Native American tribes, and fires set by ranchers in the post-settlement period are likely to have regularly burned into and through riparian areas, especially during periods of drought or extreme wind and fire weather events.

## Major Land Resource Area

MLRA 004B

Coastal Redwood Belt

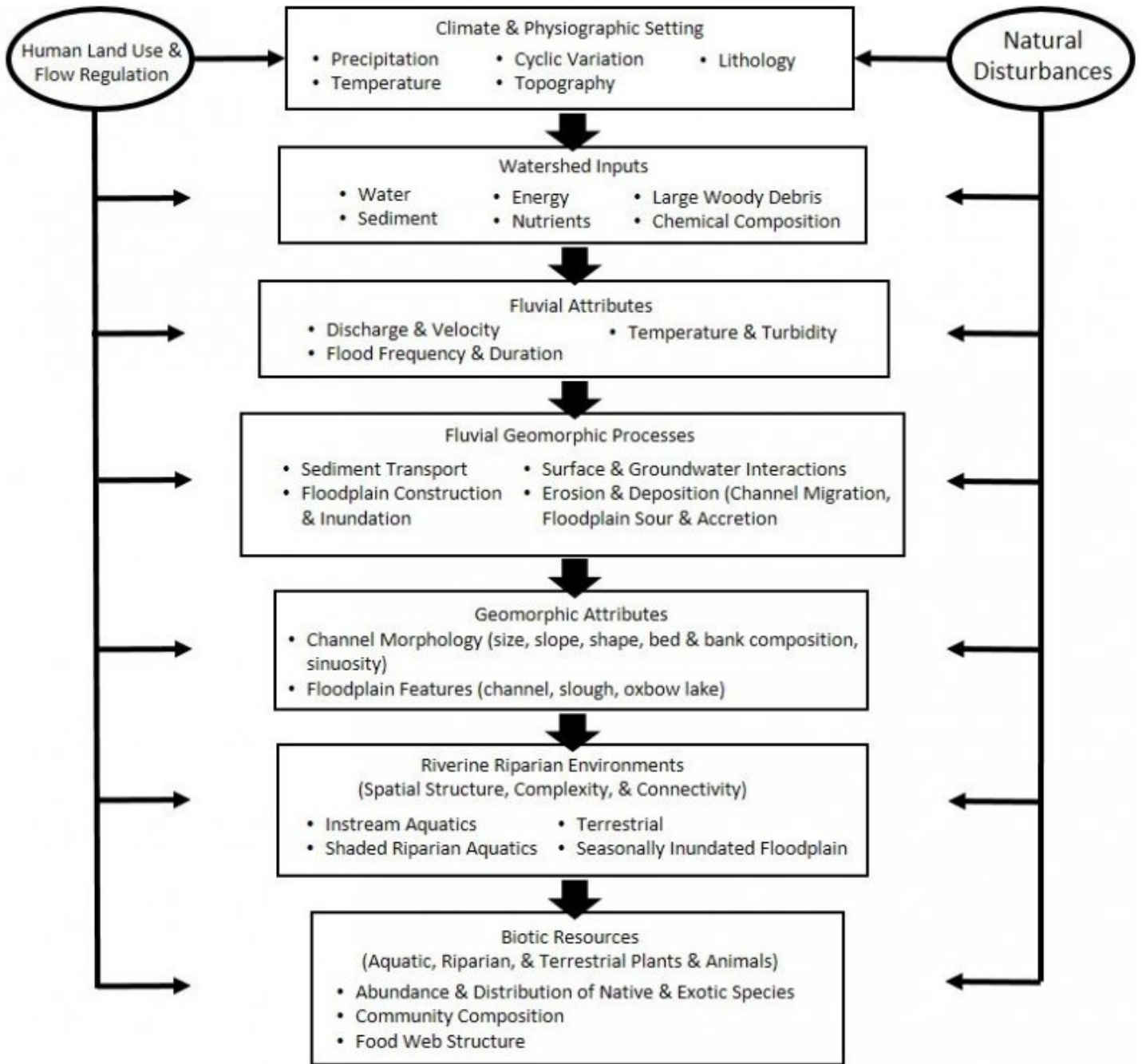
## Stage

Provisional

## Contributors

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## State and transition model



Conceptual physical and biological framework of alluvial river systems. Adapted from Barbour et al 2007.

## State 1 Reference State

Reference State (State 1) – The riparian areas of the southern reaches of the Northern Coast in general are not as floristically diverse as the riparian areas found across much of the rest of the state. The cooler climate, lower-gradient streams of LRU K create a fairly consistent variety of adapted species along a fairly narrow band directly adjacent to the streams. The reference state for this site is essentially only dominated by a limited genera of species adapted to the seasonal fluctuations of inundation from precipitation primarily in the forms of upslope surface runoff and groundwater into the valley bottoms, and the

cooler, commonly foggy climate that limits evapotranspiration rates, especially during the summer months. There are likely a variety of different riparian ecological sites that have been included in this provisional ecological site concept and should be further investigated to refine the concepts at an individual ecological site scale. At this very general scale, this reference state only really captures the generalities related to the functional groups that are most dominant and does not capture the more specific dynamics and patterns that would be found at the more detailed and refined ecological site scale that focuses on specific abiotic factors that drive some of these various complex plant expressions. More data and refinement is needed to capture the information needed in order to make specific land management decisions at the ecological site-component scale.

## **Community 1.1**

### **Reference Community Phase**

This community phase represents the riverwash portions, herbaceous portions, shrub-dominated portions and riparian forest portions of the fluvially-influenced areas within this ecological site concept. Species that are most dominant include *Alnus rubra* (red alder), *Populus* spp. (cottonwoods), *Salix* spp. (willows), *Myrica californica* (California wax myrtle), *Sambucus* spp. (elderberry), *Rubus* spp. (berries), *Ribes* spp. (currents), and an array of grasses, forbs, and grass-like. There may be locally distinct and endemic species only found in certain areas of these riparian communities, but they are not recognized at this scale of provisional ecological site concept development.

## **State 2**

This state represents the intensive land uses that have significantly altered this ecological site due to primarily to logging, urban developments, and recreational activities. More information about this state is needed to flesh out the various impacts these types of land uses/alterations have had on the ecological site in order to better understand how to better manage of these areas or potentially attempt restoration of these areas where possible.

## **Community 2.1**

### **Intensive disturbance**

This community phase represents all the varied land uses that significantly alter this ecological site. This is an extremely varied community phase that includes all types of alterations that so significantly alter the ecological site that it is permanently changed and no longer has typical or even representative ecological dynamics.

## **Transition T1**

### **State 1 to 2**

This transition is caused by significant human alterations that force this ecological site over a threshold and change the function and structure of this site in extensive ways.

## **Restoration pathway R1 State 2 to 1**

This restoration pathway occurs only when significant time and money inputs that would require constant maintenance and weed management and should be focused on areas that have not been permanently altered by urban developments.

### **Citations**