

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	<i>Populus</i>	Cottonwood
SALIX	<i>Salix</i>	Willow
ROWO	<i>Rosa woodsii</i>	Woods' rose
BETUL	<i>Betula</i>	Birch
ABCO	<i>Abies concolor</i>	White fir

JUSC2	<i>Juniperus scopulorum</i>	Rocky mountain juniper
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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 pratense*, 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
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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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Nachlinger, J., K. Sochi, P. Comer, G. Kittel and D. Dorfman. 2001. Great Basin: An ecoregion-based conservation blueprint. The Nature Conservancy, Reno, NV. 160 pp. plus appendices.

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