11540
Inter-Mountain Basins Montane Riparian Systems

BpS Model/Description Version: Aug. 2020

Modelers		Reviewers	
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None	None	None	None
None	None	None	None

Vegetation Type
Woody Wetland

Map Zones
6, 12, 16, 17

Geographic Range
Great Basin, eastern slopes of the Sierra Nevada of California, Columbia Plateau, and western edge of Northern Rockies

Biophysical Site Description
This ecological system is found within a broad elevation range -- from about 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-elevation canyons and draws, on floodplains, or in steep-sided canyons or 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. Large bottomlands may have occurrences, but most have been cut or cleared for agriculture. Rafted ice and logs in freshets may cause considerable damage to tree boles. Beaver crop younger cottonwood and willow, and frequently dam side channels occurring in these stands. In steep-sided canyons, streams typically have perennial flow in 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 are tree dominated, with a diverse shrub component. In the Great Basin and eastern Sierra Nevada, dominant trees may include *Abies concolor*, *Alnus incana*, *Betula occidentalis*, *Populus angustifolia*, *Populus balsamifera* ssp. *trichocarpa*, *Populus fremontii*, *Salix laevigata*, and *Salix gooddingii*. Dominant shrubs include *Artemisia cana*, *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 *Deschampsia caespitosa*, *Elymus trachycaulus*, *Glyceria striata*, *Iris missouriensis*, *Maianthemum stellatum*, or *Thalictrum fendleri*. In the Columbia Plateau section, important and diagnostic trees include *Populus balsamifera* ssp. *trichocarpa*, *Alnus rhombifolia*, *Populus tremuloides*, *Celtis laevigata* var. *reticulata*, *Betula occidentalis*, or *Pinus ponderosa*. Important shrubs include *Crataegus douglasii*, *Philadelphus lewisii*, *Cornus sericea*, *Salix lucida* ssp. *lasiandra*, *Salix eriocephala*, *Rosa nutkana*, *Rosa woodsii*, *Amelanchier alnifolia*, *Prunus virginiana*, and *Symphoricarpos albus.*

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
POPUL	*Populus*	Cottonwood
SALIX	*Salix*	Willow
ALNUS	*Alnus*	Alder
BETUL	*Betula*	Birch

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. Beaver (*Castor canadensis*) crop younger cottonwood (*Populus* spp.) and willow (*Salix* spp.), and frequently influence the hydrologic regime through construction of dams, etc. Beaver move from areas where tree availability is depleted. Fire disturbances occur, but are infrequent catastrophic events.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	378	100		
Moderate (Mixed)				
Low (Surface)				
All Fires	378	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 large linear features in the landscape (e.g., lower Truckee, Carson, Walker, and Humboldt rivers). 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

Comments

Map zones 6, 12, 16, and 17 were combined during 2015 Biophysical Setting (BpS) Review.

This model attempts to combine the Columbia Basin Foothill and Lower Montane Riparian woodland and shrubland (CES304.768) and Great Basin Foothill and Lower Montane Riparian woodland and shrubland (CES304.045). This model is similar to BpS 1159, with only slight modifications to vegetation species composition because BpSs 1154 and 1159 overlap in elevation and describe the lower part of meandering river systems of the Great Basin.

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	B	B	B	B	B	B	B	B	B
Shrub	>3.0	A	B	B	B	B	B	B	B	B	B
Tree	0-5	C	C	C	C	C	C	C	C	C	C
Tree	5-10	C	C	C	C	C	C	C	C	C	C
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 22 Early Development 1 - All Structures

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
POPUL	Populus	Cottonwood	Upper
SALIX	Salix	Willow	Upper
ALNUS	Alnus	Alder	Upper
CAREX	Carex	Sedge	Lower

Description

Immediate post-disturbance responses are dependent on pre-burn vegetation composition. Typically shrub dominated, but grass may co-dominate. Silt, gravel, cobble, and woody debris may be common. Composition highly variable.

Maximum Tree Size Class
None

Class B 51 Mid Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
POPUL	Populus	Cottonwood	Upper
ALNUS	Alnus	Alder	Upper
SALIX	Salix	Willow	Mid-Upper

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

Maximum Tree Size Class
Sapling >4.5ft; <5" DBH

Class C 27 Late Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
POPUL	Populus	Cottonwood	Upper
ALNUS	Alnus	Alder	Mid-Upper
SALIX	Salix	Willow	Mid-Upper

Description
This class represents mature, large cottonwood; conifer; etc. woodlands.

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	49
Late1:CLS	50	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	0.1	10	Yes	0
Optional 1	Early1:ALL	Early1:ALL	0.2	5	Yes	0
Wind or Weather or Stress	Mid1:OPN	Early1:ALL	0.01	100	Yes	0
Optional 1	Mid1:OPN	Mid1:OPN	0.025	40	No	0
Optional 1	Mid1:OPN	Early1:ALL	0.025	40	Yes	0
Wind or Weather or Stress	Mid1:OPN	Mid1:OPN	0.2	5	No	0
Optional 1	Late1:CLS	Mid1:OPN	0.001	1000	Yes	0
Wind or Weather or Stress	Late1:CLS	Early1:ALL	0.001	1000	Yes	0
Wind or Weather or Stress	Late1:CLS	Mid1:OPN	0.005	200	Yes	0
Replacement Fire	Late1:CLS	Early1:ALL	0.01	100	Yes	0

Optional Disturbances
Optional 1: Beaver

References

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