

11550

North American Warm Desert Riparian Systems

BpS Model/Description Version: Aug. 2020

Modelers		Reviewers	
John Karges	jkarges@tnc.org	None	None
Lee Elliott	lelliott@tnc.org	None	None
None	None	None	None

Reviewed by: Tim Christiansen

Vegetation Type

Woody Wetland

Map Zones

26, 35

Geographic Range

Southern Arizona and New Mexico, Trans-Pecos Texas, and adjacent Mexico.

Biophysical Site Description

Consists of mid- to low-elevation (1,100-1,800m) riparian corridors along perennial and seasonally intermittent streams. The vegetation is a mix of riparian woodlands and shrublands. Vegetation is dependent upon annual or periodic flooding and associated sediment scour and/or annual rise in the water table for growth and reproduction.

Vegetation Description

Dominant trees include narrowleaf cottonwood (*Populus angustifolia*), Rio Grande cottonwood (*P. deltoides* ssp. *wislizeni*), Fremont cottonwood (*P. fremontii*), Arizona sycamore (*Platanus wrightii*) (not Texas), Arizona walnut (*Juglans major*), velvet ash (*Fraxinus velutina*), little walnut (*J. microcarpa*), desert willow (*Chilopsis linearis*), netleaf hackberry (*Celtis laevigata* var. *reticulata*), arborescent willow (*Salix* spp.), and soapberry (*Sapindus saponaria*). Shrub dominants include narrowleaf willow (*S. exigua*), *Prunus* spp., Arizona alder (*Alnus oblongifolia*) (not Texas), Tracy's hawthorn (*Crataegus traceyi*), buttonbush (*Cephalanthus occidentalis*), brickellbush (*Brickellia* spp.), and mule's fat (*Baccharis salicifolia*).

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
PODE3	<i>Populus deltoides</i>	Eastern cottonwood
JUMI	<i>Juglans microcarpa</i>	Little walnut
BASA4	<i>Baccharis salicifolia</i>	Mule's fat

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

Disturbance Description

Episodic floods scour the land. Fire is a relatively rare event in the Biophysical Setting (BpS).

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement				
Moderate (Mixed)				

Low (Surface)				
All Fires				

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

Linear

Adjacency or Identification Concerns

Cobble arroyo shrubland types occur as a separate system in more intermittent, lower-elevation drainages but occur as a portion of this BpS. Also includes shrublands of alluvial benches adjacent to drainage in these lower montane riparian corridors. Foothill slope savanna and grasslands and shrublands.

Issues or Problems

Current issues include livestock grazing in riparian corridor that removes grass and causes streamside erosion. Browsing overstory is also a problem. Altered fire regime in adjacent systems create more closed canopy that results in decreased water infiltration reaching groundwater and maintaining perennial flow. Maintaining availability of near-surface groundwater is a concern.

Native Uncharacteristic Conditions

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	B	B	B	B	B	B	B	B
Shrub	0.5-1.0	A	B	B	B	B	B	B	B	B	B
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	UN	UN	UN	UN
Tree	5-10	C	C	C	C	C	C	UN	UN	UN	UN
Tree	10-25	C	C	C	C	C	C	UN	UN	UN	UN
Tree	25-50	C	C	C	C	C	C	UN	UN	UN	UN
Tree	>50	C	C	C	C	C	C	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	24	Early Development 1 - Open
----------------	-----------	-----------------------------------

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
BASA4	Baccharis salicifolia	Mule's fat	Lower

Description

Relatively unvegetated, scoured, or swept riparian corridor (but not scoured to bedrock which would require more time to develop soils and rooting substrates).

Maximum Tree Size Class

None

Class B	49	Mid Development 1 - Open
----------------	-----------	---------------------------------

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
BASA4	Baccharis salicifolia	Mule's fat	Lower
BRICK	Brickellia	Brickellbush	Lower
JUMI	Juglans microcarpa	Little walnut	Low-Mid
CHLI2	Chilopsis linearis	Desert willow	Lower

Description

Shrub-dominated areas of relatively closed canopy often dominated by mule's fat (*Baccharis salicifolia*), brickellbush (*Brickellia* spp.), and scattered, sometimes patchy little walnut (*J. microcarpa*) and desert willow (*Chilopsis linearis*). Cottonwood (*P. deltoides*) and arborescent *Salix* species occur within this shrub layer as small trees in recruitment. This class is stable on the landscape, lasting for 40yrs on average, due to the lack of substrate conducive to germination and growth of *Populus*. This may be counterintuitive due to the rather rapid growth of *Populus* (~25yrs to canopy), potentially reaching the *canopy* if germination is possible. This lack of *Populus* recruitment results from the availability of germination substrate. Another factor that could influence recruitment may be availability of subsurface water for growth of *Populus*.

Maximum Tree Size Class

None

Class C	27	Late Development 1 - Closed
----------------	-----------	------------------------------------

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
--------	-----------------	-------------	-----------------

PODE3	Populus deltoides	Eastern cottonwood	Upper
SALIX	Salix	Willow	Mid-Upper

Description

Linear woodlands up to several miles in extent. Dominated by mature *P. deltoides* with canopy closure of >50%. Understory of a relatively sparse mixed shrub/young tree layer, including Texas swamp privet (*Forestiera angustifolia*), *Baccharis salicifolia*, and *Brickellia* spp. Rare flood events (estimated at once every 150yrs) can be catastrophic. After 120yrs, these generally even-aged stands become senescent and die. The assumption is that recruitment is inadequate for stand replacement.

Maximum Tree Size Class

Very Large >33" DBH

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:OPN	0	Mid1:OPN	10
Mid1:OPN	11	Late1:CLS	50
Late1:CLS	51	Early1:OPN	120

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
Optional 1	Early1:OPN	Early1:OPN	0.2	5	No	0
Optional 1	Mid1:OPN	Early1:OPN	0.04	25	Yes	0
Optional 1	Mid1:OPN	Mid1:OPN	0.2	5	No	0
Optional 1	Late1:CLS	Early1:OPN	0.007	143	Yes	0

Optional Disturbances

Optional 1: flooding

References

Diamond, D.D. 1993. Plant communities of Texas (series level). Unpubl. doc. Tex. Nat. Heritage Prog. Austin. 25 p.

Henrickson, J. and M.C. Johnston. 1986. Vegetation and community types of the Chihuahuan Desert. Pages 20-39 in: J.C. Barlow, A.M. Powell and B.N. Timmermann, eds. Chihuahuan Desert--U.S. and Mexico, II: Proceedings of the 2nd symposium on resources of the Chihuahuan Desert region; 1983 October 20-21; Alpine, TX. Alpine, TX: Sul Ross State University, Chihuahuan Desert Research Institute.

NatureServe. 2007. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA. Data current as of 10 February 2007.