

15230

Edwards Plateau Dry-Mesic Slope Forest and Woodland

BpS Model/Description Version: Aug. 2020

Update 3/18

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Vegetation Type

Forest and Woodland

Map Zones

32, 35

Geographic Range

This system is expected to occur on slopes in the Edwards Plateau and Lampasas Cutplain.

Biophysical Site Description

This system occurs on limestone slopes in the Edwards Plateau of Texas.

Vegetation Description

The canopy is typically dominated by trees, including Ashe juniper (*Juniperus ashei*), Buckley oak (*Quercus buckleyi*, more common in the eastern part of the range), Lacey oak (*Q. laceyi*, more common in the western part of the range), or cedar elm (*Ulmus crassifolia*). Plateau oak (*Q. fusiformis*) is often present but not dominant in this system; Texas ash (*Fraxinus texensis*) can be a canopy co-dominant in the eastern part of the range. Canopy closure is variable, and this system can be expressed as forests and woodlands. This system may include small patch inclusions of more riparian related vegetation that usually occurs at a scale that will be difficult to distinguish using remote sensing (may be referred to as wooded draws).

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
SCSC	<i>Schizachyrium scoparium</i>	Little bluestem
QUBU2	<i>Quercus buckleyi</i>	Buckley oak
QULA	<i>Quercus laceyi</i>	Lacey oak
ULCR	<i>Ulmus crassifolia</i>	Cedar elm
Unknown	<i>Juniperus ashei</i>	Ashe juniper

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

Disturbance Description

Stand replacement fires are infrequent (50-100yrs). Surface non-replacement fires occur at ~30-40yr intervals. Disease present (e.g. oak-wilt) though uncertain as to the prevalence historically. Fires ignited in adjacent grasslands and move into forests through ladder fuels. Extreme droughts (e.g., 2011) may cause mortality of large numbers of trees.

Fire Frequency Results

Severity	Min FI	Max FI
Replacement		
Moderate (Mixed)		
Low (Surface)		
All Fires		

Scale Description

Size limited by slope width often in bands of 50-400m in breadth. Where diverse terrain exists, community is widespread but isolated on slopes.

Adjacency or Identification Concerns

Edwards Plateau Mesic Canyon is limited to steep, narrow canyons that support more mesic species. On plateau tops, shinnery communities (e.g. Edwards Plateau Limestone Shrubland) become dominant. On toe slopes, the forest gives way to Edwards Plateau Limestone Savanna and Woodland. Also, Central Mixed Grass and Western Great Plains Shortgrass Prairies occur on lower slopes and plateau tops. This Biophysical Setting (BpS) may transition to riparian or floodplain systems in some situations.

Issues or Problems

Shifts in dominance of juniper and deciduous species through time is questionable. One assumption is the deciduous dominance has declined in favor of juniper with fire suppression over the last century, but many early accounts mention “cedar” as a major component of the vegetation. Droughts may cause shifts, since Ashe juniper appears to be more susceptible to drought than some of the hardwood species: after the 2011 drought, large numbers of Ashe junipers died.

Native Uncharacteristic Conditions

Juniper increase suspected with decreased fire on the landscape. However, many early accounts of the vegetation in this area mention dense, extensive stands of “cedar” (Lisa O’Donnell with the City of Austin has compiled a large database of such accounts).

Comments

This model was developed for map zone (MZ)35 by Charlotte Reemts and Joseph White. Suggested reviewers for MZ35 include: Chuck Sexton (USFWS, Balcones Canyonlands National Wildlife Refuge) and David Diamond (MO).

Succession Classes

Mapping Rules

		Canopy Cover (%)
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Upper Layer Lifeform	Height (m)	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	B	B	B	B	B	B	B	B	B	B
Shrub	0.5-1.0	B	B	B	B	B	B	B	B	B	B
Shrub	1.0-3.0	B	B	B	B	B	B	B	B	B	B
Shrub	>3.0	B	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	E	E	E	E	D	D
Tree	10-25	C	C	C	C	E	E	E	E	D	D
Tree	25-50	C	C	C	C	E	E	E	E	D	D
Tree	>50	C	C	C	C	E	E	E	E	D	D

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 2 Early Development 1 - All Structures

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SCSC	Schizachyrium scoparium	Little bluestem	Upper
MULI	Muhlenbergia lindheimeri	Lindheimer's muhly	Upper
BOCU	Bouteloua curtipendula	Sideoats grama	Upper

Description

Open grassland/savanna which initiates either through very frequent fires or through landslide (small). This class succeeds to Class B.

Maximum Tree Size Class

None

Class B 6 Early Development 2 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SCSC	Schizachyrium scoparium	Little bluestem	Mid-Upper
BOCU	Bouteloua curtipendula	Sideoats grama	Mid-Upper
RHLA3	Rhus lanceolata	Prairie sumac	Upper
BANE2	Baccharis neglecta	Rooseveltweed	Upper

Description

In the absence of major surface fire, initiation of woody species occurs, predominantly Ashe juniper re-sprouting hardwood species. Flame leaf sumac (*Rhus spp.*) and baccharis (*Baccharis spp.*) occur often as associates during this phase and provide moderate aerial fuels.

Surface fires expected to maintain stage. Multiple replacement fires (included in the probability estimation) returns to Class A. On mesic sites, stand turns into dense, stem exclusion forest (Class D; modeled as alternate succession); otherwise (especially on drier sites) this class will succeed to open woodland (Class C).

Maximum Tree Size Class

None

Class C	10	Mid Development 1 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
JUAS	<i>Juniperus ashei</i>	Ashe's juniper	Upper
ULCR	<i>Ulmus crassifolia</i>	Cedar elm	Upper
QUBU2	<i>Quercus buckleyi</i>	<i>Quercus buckleyi</i>	Upper
CAPL3	<i>Carex planostachys</i>	Cedar sedge	Lower

Description

This community emerges on drier sites and/or sites experiencing multiple fires in mature stands. The maximum size (21-33in) is indicative of remnant large trees following a burn. On sites recovering from a canopy fire, juniper may be absent. Lacey oak is more common in the western part of this vegetation type; Buckley oak is more common in the east

Surface fires are expected to maintain this stage. Multiple replacement fires (included in the probability estimation) returns to Class B. In the absence of replacement fire, this class succeeds to Class D.

Maximum Tree Size Class

Large 21-33"DBH

Class D	13	Mid Development 2 - Closed
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
JUAS	<i>Juniperus ashei</i>	Ashe's juniper	Upper
QUBU	<i>Quercus buckleyi</i>	<i>Quercus buckleyi</i>	Upper
ULCR	<i>Ulmus crassifolia</i>	Cedar elm	Upper

Description

Without major surface fires, dense stand of trees emerges with increased competition and autogenic mortality. Surface fuels become limited with elimination of herbaceous growth.

Surface fires are expected to maintain this stage. Mixed fires can open the canopy and return this stage to Class C. In the absence of mixed fire, this class succeeds to Class E.

Maximum Tree Size Class

Medium 9-21"DBH

Class E	69	Late Development 1 - Closed
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
JUAS	Juniperus ashei	Ashe's juniper	Upper
QUBU2	Quercus bucklei	Quercus buckleyi	Upper
FRTE	Fraxinus texensis	Texas ash	Upper

Description

Late development, mature slope forest dominated by junipers and oaks. Typical oak belt forms where geologic formations increase soil moisture. Some gaps may be present where trees fall due to disease or ice damage inducing regeneration. Downed woody material present and provides significant surface fuels. Duff loading is still low.

Surface fires are expected to maintain this stage. Mixed fire sends to Class C assuming that the smaller trees are consumed leaving the larger trees. Mixed fire return interval was estimated on the basis the time required for *J. ashei* to reach the canopy, based on Fort Hood crown fire data.

Note that cover in this class may be higher than indicated but was retained to ensure lack of overlap with Class D.

Maximum Tree Size Class

Large 21-33"DBH

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Early2:OPN	3
Early2:OPN	4	Mid1:OPN	30
Mid1:OPN	31	Mid2:CLS	50
Mid2:CLS	51	Late1:CLS	70
Late1:CLS	71	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
Replacement Fire	Early1:ALL	Early1:ALL	0.2	5	Yes	0
Replacement Fire	Early2:OPN	Early1:ALL	0.05	20	Yes	0
Alternative Succession	Early2:OPN	Mid2:CLS	0.07	14	Yes	0
Surface Fire	Early2:OPN	Early2:OPN	0.2	5	No	0
Surface Fire	Mid1:OPN	Mid1:OPN	0.033	30	No	0
Replacement Fire	Mid1:OPN	Early2:OPN	0.04	25	Yes	0
Mixed Fire	Mid2:CLS	Mid1:OPN	0.01	100	Yes	0
Surface Fire	Mid2:CLS	Mid2:CLS	0.013	77	No	0
Mixed Fire	Late1:CLS	Mid1:OPN	0.009	111	Yes	0
Surface Fire	Late1:CLS	Late1:CLS	0.025	40	No	0

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