

14080

Alabama Ketona Glade and Woodland

BpS Model/Description Version: Aug. 2020

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Modelers		Reviewers	
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None	None	None	None
None	None	None	None

Vegetation Type

Steppe/Savanna

Map Zones

48

Geographic Range

This system/BpS is restricted to slopes on Ketona dolomite found in Bibb County, Alabama, in the vicinity of the Little Cahaba River. This is in the Ridge and Valley physiographic province (EPA 2004) but some occurrences may appear to be in the adjacent upper coastal plain, depending on the scale at which the physiographic provinces are mapped.

Biophysical Site Description

The Biophysical Setting (BpS) occurs along moderate to steep slopes and steep valleys on primarily southerly to westerly facing slopes. Outcrops of Ketona dolomite bedrock, which has a very limited distribution in Bibb County, Alabama, typify this system. It has shallow, moderately to well-drained soils interspersed with rocks. These soils often dry out during the summer and autumn, and may become saturated during the winter and spring.

Vegetation Description

The vegetation of the system includes a mixture of herbaceous, shrubland, and open woodlands, which occur on thin soils around outcrops of Ketona dolomite. *Juniperus virginiana*, *Quercus muehlenbergii*, *Pinus palustris*, *Croton alabamensis*, *Sabal minor*, and *Leptopus phyllanthoides* are the dominant woody plants of the woodlands. Little bluestem (*Schizachyrium scoparium*) is a frequent grass in this system and is commonly associated with big bluestem (*Andropogon gerardii*), and other calcium-loving, drought-tolerant plant species. Stunted woodlands are primarily dominated by chinquapin oak (*Quercus muehlenbergii*) interspersed with Eastern redcedar (*Juniperus virginiana*) occur on variable-depth-to-bedrock soils. The trees may occur as islands in a wider herbaceous or rocky area. The islands are found in microenvironments where the soil depth and available water are sufficient to support trees (e.g. depressions or fissures in the bedrock). Small-scale stands of annual dropseed (*Sporobolus* spp.) may be prominent in some examples. More than 60 plant taxa of conservation concern occur on or near these glades, marking them as one of the most significant reservoirs of botanical diversity in the eastern United States. Eight endemic taxa were found and newly described: *Castilleja kraliana*, *Coreopsis grandiflora* var. *inclinata*, *Dalea cahaba*, *Erigeron strigosus* var. *dolomiticola*, *Liatris oligocephala*, *Onosmodium decipiens*, *Silphium glutinosum*, and *Spigelia gentianoides* var. *alabamensis*. Seven Alabama state records were discovered: *Solanum pumilum*, last collected in

1837 and presumed extinct; *Astrolepis integerrima*, disjunct from Texas; *Paronychia virginica*, bridging a gap between Arkansas and Virginia; *Baptisia australis* var. *australis*, *Rhynchospora capillacea*, *Rhynchospora thornei*, and *Spiranthes lucida*.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
SCSC	<i>Schizachyrium scoparium</i>	Little bluestem
ANGE	<i>Andropogon gerardii</i>	Big bluestem
QUMU	<i>Quercus muehlenbergii</i>	Chinkapin oak
CRAL3	<i>Croton alabamensis</i>	Alabama croton
SAMI8	<i>Sabal minor</i>	Dwarf palmetto
LEPH11	<i>Leptopus phyllanthoides</i>	Missouri maidenbush
JUVI	<i>Juniperus virginiana</i>	Eastern redcedar

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

Disturbance Description

Fire and periodic drought both play a role in the natural dynamic. Fires help manage this system by restricting woody growth and maintaining the more open glade structure. Historically grazing by wild and domestic ungulate species represented a significant disturbance regime. Regionally significant drought cycles affect severity of other disturbance regimes. Some portions of sites for this system are so droughty and rocky that woody succession is severely retarded and fuels are either sparse or composed of low annual grasses and scattered forbs.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	19	18		
Moderate (Mixed)	16	21		
Low (Surface)	6	61		
All Fires	3	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

These glade/woodland complexes occur in patches in areas of dozens to perhaps 100ac in size.

Adjacency or Identification Concerns

Stands of this system are composed of an intermingled complex of open rocky glades and dry oak woodlands on calcareous soils and/or rock outcrops. Identification concerns include distinguishing stands of Eastern redcedar found on old fields and abandoned pastures in late, primary succession from over-encroachment of glades by Eastern redcedar. The pattern of interspersed Eastern redcedar with open, rocky zones should distinguish the glades from the successional Eastern redcedar, which is more continuous over larger areas.

Issues or Problems

Based on model for 4714010 (M. Pyne 2008).

Native Uncharacteristic Conditions

Over-encroachment of native Eastern redcedar (*J. virginiana*) may occur today, in the prolonged absence of fire.

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	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	A	A	A	E	E	E	E	E	E	E
Tree	5-10	C	C	C	E	E	E	E	E	E	E
Tree	10-25	D	D	D	E	E	E	E	E	E	E
Tree	25-50	D	D	D	E	E	E	E	E	E	E
Tree	>50	D	D	D	E	E	E	E	E	E	E

Succession class letters A-E are described in the Succession Class Description section. Some classes use a leaf form 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 59 Early Development 1 - All Structures

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SCSC	Schizachyrium scoparium	Little bluestem	Lower
ANGE	Andropogon gerardii	Big bluestem	Lower
QUMU	Quercus muehlenbergii	Chinkapin oak	All
JUVI	Juniperus virginiana	Eastern redcedar	All

Description

Perennial and annual forbs, grasses, and sedges dominate. The ground vegetation ranges to 4ft high by midsummer. Scattered stunted trees persist in fissures in the soil. Tree species include oak and redcedar seedlings.

Maximum Tree Size Class

Seedling <4.5ft

Mid Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
JUVI	<i>Juniperus virginiana</i>	Eastern redcedar	All
LEPH11	<i>Leptopus phyllanthoides</i>	Missouri maidenhush	Low-Mid
CRAL3	<i>Croton alabamensis</i>	Alabama croton	Low-Mid
QUMU	<i>Quercus muehlenbergii</i>	Chinkapin oak	All

Description

Mid-seral closed canopy dominated by small tree to shrub-sized eastern redcedars. Isolated areas rarely affected by fire. Herbaceous layer persists but is overtopped by shrubs. Scattered hardwood saplings occur within shrub layer, and scattered stunted trees occur in the upper canopy.

Maximum Tree Size Class

Pole 5-9" DBH

Mid Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SCSC	Schizachyrium scoparium	Little bluestem	Lower
ANGE	Andropogon gerardii	Big bluestem	Lower
QUMU	Quercus muehlenbergii	Chinkapin oak	Mid-Upper
SAMI8	Sabal minor	Dwarf palmetto	Low-Mid

Description

Mid-seral open canopy dominated by herbaceous layer of perennial grasses, forbs, and sedges. Shrub component occurs as cedar species and oak sprouts. Low-intensity, frequent fires maintain open structure (surface and mixed). Trees are scattered, but have developed some crown structure. Bedrock outcroppings remain open. Edaphic conditions determine species composition and arrangement. Likely represents greatest diversity among classes.

Maximum Tree Size Class

Medium 9-21"DBH

Late Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SCSC	Schizachyrium scoparium	Little bluestem	Lower
ANGE	Andropogon gerardii	Big bluestem	Lower
QUMU	Quercus muehlenbergii	Chinkapin oak	Upper
SAMI8	Sabal minor	Dwarf palmetto	Low-Mid

Late-seral open canopy dominated herbaceous layer of perennial grasses, forbs, and sedges. Scattered shrub component occurs as cedar and oak saplings and resprouts. Tree species occur as widely-scattered oaks with well-developed crowns.

Large 21-33"DBH

Class E	1	Late Development 1 - Closed
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Symbol	Scientific Name	Common Name	Canopy Position
JUVI	<i>Juniperus virginiana</i>	Eastern redcedar	All
QUMU	<i>Quercus muehlenbergii</i>	Chinkapin oak	All
SAMI8	<i>Sabal minor</i>	Dwarf palmetto	Low-Mid
LEPH11	<i>Leptopus phyllanthoides</i>	Missouri maidenbush	Low-Mid

Late-seral closed canopy dominated by shrub and tree layer of Eastern redcedar. Widely scattered trees occur with stunted canopy growth due to competition of resources. Herbaceous layer largely reduced and extremely scattered. Bedrock layers are heavily encroached and may be completely covered in some areas.

Medium 9-21"DBH

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Mid1:OPN	20
Mid1:OPN	21	Late1:OPN	70
Mid1:CLS	21	Late1:CLS	70
Late1:OPN	71	Late1:OPN	999
Late1:CLS	71	Late1:CLS	999

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
Alternative Succession	Early1:ALL	Mid1:CLS	1	1	Yes	19
Mixed Fire	Early1:ALL	Early1:ALL	0.05	20	No	0
Replacement Fire	Early1:ALL	Early1:ALL	0.07	14	Yes	0
Surface Fire	Early1:ALL	Early1:ALL	0.2	5	No	0

Alternative Succession	Mid1:OPN	Mid1:CLS	1	1	Yes	10
Replacement Fire	Mid1:OPN	Early1:ALL	0.04	25	Yes	0
Mixed Fire	Mid1:OPN	Mid1:OPN	0.1	10	No	0
Native Grazing	Mid1:OPN	Mid1:OPN	0.15	7	No	0
Surface Fire	Mid1:OPN	Mid1:OPN	0.2	5	No	0
Wind or Weather or Stress	Mid1:CLS	Mid1:CLS	0.005	200	No	0
Mixed Fire	Mid1:CLS	Mid1:OPN	0.01	100	Yes	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.02	50	Yes	0
Alternative Succession	Late1:OPN	Late1:CLS	1	1	Yes	30
Replacement Fire	Late1:OPN	Early1:ALL	0.015	67	Yes	0
Mixed Fire	Late1:OPN	Late1:OPN	0.1	10	No	0
Native Grazing	Late1:OPN	Late1:OPN	0.15	7	No	0
Surface Fire	Late1:OPN	Late1:OPN	0.2	5	No	0
Wind or Weather or Stress	Late1:CLS	Late1:OPN	0.005	200	Yes	0
Replacement Fire	Late1:CLS	Early1:ALL	0.0083	120	Yes	0
Mixed Fire	Late1:CLS	Late1:OPN	0.05	20	Yes	0

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