

# Ecological site R087AY003TX Claypan Savannah

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## General information

**Provisional.** A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

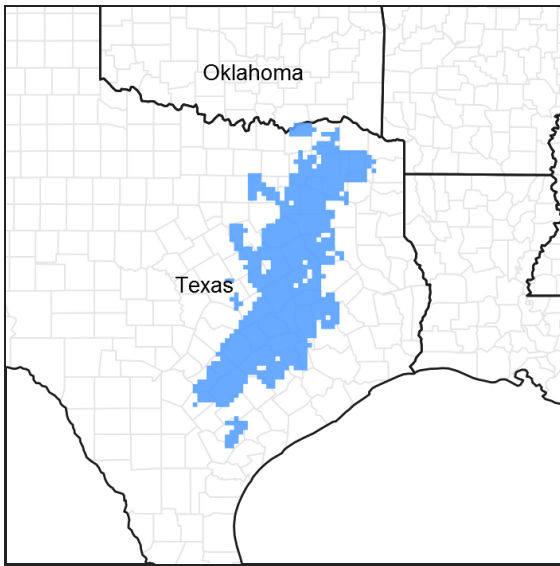


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

## MLRA notes

Major Land Resource Area (MLRA): 087A–Texas Claypan Area, Southern Part

This area is entirely in south-central Texas. It makes up about 10,535 square miles (27,295 square kilometers). The towns of Bastrop, Bryan, Centerville, College Station, Ennis, Fairfield, Franklin, Giddings, Gonzales, Groesbeck, La Grange, Madisonville, and Rockdale are in this MLRA. Interstate 45 crosses the northern part of the area, and Interstate 10 crosses the southern part. A number of State Parks are located throughout this area. The parks are commonly associated with reservoirs.

## Classification relationships

USDA-Natural Resources Conservation Service, 2006.  
-Major Land Resource Area (MLRA) 87A

## Ecological site concept

The Claypan Savannah ecological site is characterized by a fine sandy loam surface soil underlain by a dense clay subsoil. This is also the typifying site to which the MLRA derived its name. The clay subsoil impacts water movement through the soil, which often perches water.

## Associated sites

R087AY001TX	<b>Gravelly</b> Gravelly
R087AY002TX	<b>Sandstone Hill</b> Sandstone Hill
R087AY005TX	<b>Sandy Loam</b> Sandy Loam
R087AY006TX	<b>Sandy</b> Sandy
R087AY011TX	<b>Loamy Bottomland</b> Loamy Bottomland
R087AY012TX	<b>Clayey Bottomland</b> Clayey Bottomland

## Similar sites

R087BY002TX	<b>Claypan Savannah</b> Different MLRA.
R087AY001TX	<b>Gravelly</b> Gravelly
R087AY005TX	<b>Sandy Loam</b> Sandy Loam

**Table 1. Dominant plant species**

Tree	(1) <i>Quercus stellata</i> (2) <i>Ulmus alata</i>
Shrub	(1) <i>Ilex vomitoria</i> (2) <i>Callicarpa americana</i>
Herbaceous	(1) <i>Schizachyrium scoparium</i> (2) <i>Sorghastrum nutans</i>

## Physiographic features

This site occurs as nearly level to sloping uplands. Slopes range from 0 to 15 percent, but are generally 1 to 8 percent. The soils are underlain by a dense clay subsoil and during large precipitation events, the sites can briefly pond water. Some sites will have a high water table, which is generally highest in late winter and early spring.

**Table 2. Representative physiographic features**

Landforms	(1) Plains > Stream terrace (2) Plains > Ridge
Runoff class	Medium to very high
Flooding frequency	None
Ponding duration	Very brief (4 to 48 hours)
Ponding frequency	None to rare
Elevation	61–229 m
Slope	1–8%
Ponding depth	0–8 cm
Water table depth	0–203 cm
Aspect	Aspect is not a significant factor

**Table 3. Representative physiographic features (actual ranges)**

Runoff class	Not specified
Flooding frequency	Not specified
Ponding duration	Not specified
Ponding frequency	Not specified
Elevation	Not specified
Slope	0–15%
Ponding depth	Not specified
Water table depth	Not specified

## Climatic features

The climate for MLRA 87A is humid subtropical and is characterized by hot summers, especially in July and August, and relatively mild winters. The summer months have little variation in day-to-day weather except for occasional thunderstorms that dissipate the afternoon heat. The moderate temperatures in spring and fall are characterized by long periods of mild days and cool nights. The average annual precipitation in this area is 41 inches. Most of the rainfall occurs in spring and fall. The freeze-free period averages about 276 days and the frost-free period 241 days.

**Table 4. Representative climatic features**

Frost-free period (average)	241 days
Freeze-free period (average)	276 days
Precipitation total (average)	1,041 mm

## Climate stations used

- (1) BELLVILLE 6NNE [USC00410655], Bellville, TX
- (2) GONZALES 1N [USC00413622], Gonzales, TX
- (3) LA GRANGE [USC00414903], La Grange, TX
- (4) MADISONVILLE [USC00415477], Madisonville, TX
- (5) SMITHVILLE [USC00418415], Smithville, TX
- (6) CROCKETT [USC00412114], Crockett, TX
- (7) FAIRFIELD 3W [USC00413047], Fairfield, TX
- (8) COLLEGE STN [USW00003904], College Station, TX
- (9) BARDWELL DAM [USC00410518], Ennis, TX
- (10) ELGIN [USC00412820], Elgin, TX
- (11) FRANKLIN [USC00413321], Franklin, TX
- (12) SOMERVILLE DAM [USC00418446], Somerville, TX

## Influencing water features

The site can have a high water table. Water tables are most common in the late winter and early spring, or anytime the soil is saturated from large precipitation events.

## Wetland description

A stream or wetland does not influence the plant community of this site.

## Soil features

The soils are shallow to very deep and typically have fine sandy loam surfaces and dense clay subsoil. The fine sandy loam topsoil ranges from 6 to 15 inches deep but averages less than 10 inches. The surface soil takes in

water readily but the clay subsoil is very slowly permeable and restricts air movement and root growth. The very slow permeability and shallow topsoil cause the site to be wet in the winter, slow to warm in the spring, and droughty during the growing season. Low to moderate fertility somewhat limits production on this site. Under good management where herbaceous cover and litter are maintained, rills, gullies, pedestals, and soil compaction layers are not present on the site. Soils correlated to this site include: Arol, Axtell, Burlewash, Chigley, Crockett, Darst, Derly, Edge, Falba, Gredge, Koether, Kurten, Lufkin, Rader, Raino, Ruterville, Sarco, Shalba, Singleton, Singleton, variant, Tabor, Winedale, and Zack.

**Table 5. Representative soil features**

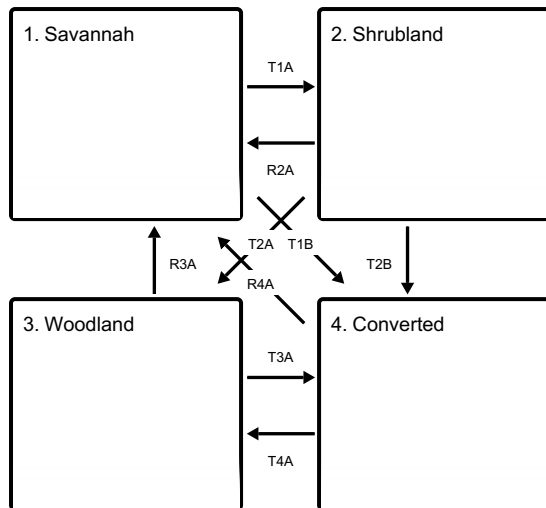
Parent material	(1) Residuum—sandstone and shale (2) Alluvium—metamorphic and sedimentary rock
Surface texture	(1) Fine sandy loam (2) Loamy fine sand (3) Loam
Family particle size	(1) Clayey
Drainage class	Somewhat poorly drained to moderately well drained
Permeability class	Slow to very slow
Soil depth	38–203 cm
Surface fragment cover ≤3"	0–1%
Surface fragment cover >3"	0–1%
Available water capacity (0-101.6cm)	2.54–15.24 cm
Calcium carbonate equivalent (0-101.6cm)	0–5%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–12
Soil reaction (1:1 water) (0-101.6cm)	4.5–7.8
Subsurface fragment volume ≤3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0–1%

## Ecological dynamics

The Claypan Savannah ecological site evolved and was maintained by the grazing and herding effects of native wild large ungulates, periodic fires, and climatic fluctuations. Conversion of this site to cropland and the subsequent abandonment of cropping removed the natural native vegetation, organic matter, fertility, and allowed woody species to invade the site. Continuous grazing by domestic livestock and the suppression of fire on non-cropland sites removes little bluestem (*Schizachyrium scoparium*), Indiangrass (*Sorghastrum nutans*), switchgrass (*Panicum virgatum*), Engelmann's daisy (*Engelmannia peristenia*), yellow neptunia (*Neptunia lutea*), and gayfeather (*Liatris elegans*). Less productive perennial and annual grasses, forbs, vines, and shrubs will replace these plants. With continued continuous grazing, no brush management, and the absence of periodic fires, a community dominated by winged elm (*Ulmus alata*), eastern persimmon (*Diospyros virginiana*), mesquite (*Prosopis glandulosa*), yaupon (*Ilex vomitoria*), post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), and eastern red cedar (*Juniperus virginiana*) will replace the savannah.

## State and transition model

## Ecosystem states



**T1A** - Heavy continuous grazing, no brush management, abandonment

**T1B** - Brush management, crop cultivation, pasture planting

**R2A** - Brush management, prescribed grazing, prescribed burning

**T2A** - Heavy continuous grazing, no brush management, abandonment

**T2B** - Brush management, crop cultivation, pasture planting

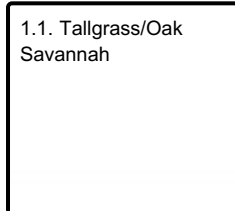
**R3A** - Brush management, range planting, prescribed grazing

**T3A** - Brush management, crop cultivation, pasture planting

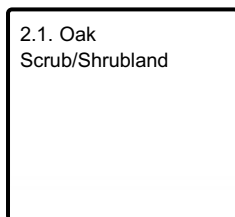
**R4A** - Range planting, prescribed grazing, prescribed burning

**T4A** - Heavy continuous grazing, no brush management, abandonment

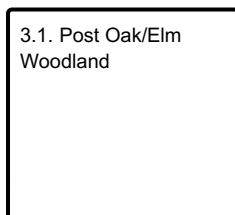
## State 1 submodel, plant communities



## State 2 submodel, plant communities



## State 3 submodel, plant communities



State 4 submodel, plant communities

4.1. Converted Land

State 1  
Savannah

One community exists in the Savannah State, the 1.1 Tallgrass/Oak Savannah Community. The State is dominated by warm season perennial grasses and the overstory canopy cover is less than 20 percent.

Community 1.1  
Tallgrass/Oak Savannah



The interpretive plant community of this site is the reference plant community. This site is a fire-climax savannah of post oak and blackjack oak trees that shade 15 to 20 percent of the ground. The herbaceous component is tall and midgrasses dominated by little bluestem, Indiangrass, and brownseed paspalum (*Paspalum plicatulum*), which usually make up 50 to 75 percent of the total annual yield. Purpletop tridens (*Tridens flavus*), Florida paspalum (*Paspalum floridanum*), switchgrass, tall dropseed (*Sporobolus compositus*), and thin paspalum (*Paspalum setaceum*) also occur. Cool-season forage plants occurring on this site include Canada wildrye (*Elymus canadensis*), Engelmann's daisy, and sedges (*Carex* spp.). A variety of shrubs, vines, and forbs occur in this community. Grazing prescriptions that permit acceptable grazing periods and allow adequate rest periods with prescribed fire every three to five years are important in the maintenance of the herbaceous plant community and the savannah landscape structure. Continuous overgrazing or over rest and the absence of fire tend to allow a vegetative shift towards woody species such as eastern persimmon, eastern red cedar, and winged elm. Without corrective measures, this shift will continue to the Shrubland State.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2522	3811	4119
Tree	504	673	841
Forb	168	336	364
Shrub/Vine	168	224	280
<b>Total</b>	<b>3362</b>	<b>5044</b>	<b>5604</b>

State 2

## Shrubland

One community exists in the Shrubland State, the 2.1 Oak Scrub/Shrubland Community. The herbaceous production is not as great compared to the Savannah State, and overstory canopy has increased between 20 and 50 percent.

### Community 2.1 Oak Scrub/Shrubland



This plant community is a transitional community between the Savannah and Woodland State. It develops in the absence of fire or mechanical or chemical treatments. It is usually the result of abandonment following cropping or yearly continuous grazing. Trees and shrubs begin to replace the grassland component of the savannah community. In addition to the naturally occurring post oak and blackjack oak, winged elm, water oak (*Quercus nigra*), mesquite, eastern persimmon, bumelia (*Sideroxylon lanuginosum*), eastern red cedar, yaupon, and greenbriar (*Smilax* spp.) increase in density and canopy coverage (20 to 50 percent). Species whose seeds are windblown (elm) or animal dispersed (persimmon, mesquite, eastern red cedar, bumelia) are the first to colonize and dominate the site. Remnants of little bluestem and Indiangrass may still occur but the herbaceous component of the community becomes dominated by lesser producing grasses and forbs. Silver bluestem (*Bothriochloa laguroides*), tall dropseed, arrowfeather threeawn (*Aristida purpurascens*), Scribner's dichanthelium (*Dichanthelium oligoanthes*), thin paspalum, Hall's panicum (*Panicum hallii*), western ragweed (*Ambrosia psilostachya*), croton (*Croton* spp.), and narrowleaf sumpweed (*Iva angustifolia*) commonly occur. If the woody shrub canopy has not exceeded 50 percent, prescribed burning on a three to five year interval in conjunction with prescribed grazing is a viable option for returning this community to a Savannah State that may resemble the reference plant community. If the woody canopy exceeds 50 percent, chemical or mechanical brush control must also be applied to move this transitional community back towards the reference plant community.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1009	1569	1681
Tree	785	1121	1345
Shrub/Vine	224	336	392
Forb	224	336	392
<b>Total</b>	<b>2242</b>	<b>3362</b>	<b>3810</b>

## State 3 Woodland

One community exists in the Woodland State, the Post Oak/Elm Woodland Community. The site is characterized by little herbaceous production. The overstory canopy is over 50 percent and shrubs also limit light to the surface.



### Community 3.1 Post Oak/Elm Woodland



This plant community is a closed overstory (50 to 80 percent) woodland dominated by post oak, winged elm, blackjack oak, black hickory (*Carya texana*), eastern red cedar, and water oak. Understory shrubs and sub-shrubs include yaupon, farkleberry (*Vaccinium arboreum*), possumhaw (*Ilex decidua*), and American beautyberry (*Callicarpa americana*). Woody vines also occur and include Alabama supplejack (*Berchemia scandens*), poison ivy (*Toxicodendron radicans*), grape (*Vitis* spp.), greenbriar, trumpet creeper (*Campsis radicans*), Virginia creeper (*Parthenocissus quinquefolia*), and peppervine (*Ampelopsis arborea*). A herbaceous understory is almost nonexistent but shade tolerant species including longleaf woodoats (*Chasmanthium sessiliflorum*), broadleaf woodoats (*Chasmanthium latifolium*), cedar sedge (*Carex planostachys*), ironweed (*Veronia baldwinii*), and goldenrod (*Solidago* spp.) may occur in small amounts. Prescribed fire may be used to convert this site back to the tallgrass/oak savannah but may take many consecutive years of burning due to light fine fuel loads. Chemical brush control on a large scale is usually not a treatment option on this site due to the herbicide resistance of yaupon. Individual plant treatment with herbicides on small acreage may be a viable option. Mechanical treatment of this site, along with seeding, is the most viable option for reversion back to a tallgrass savannah, but the economic viability of this option is questionable.

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Tree	1765	2354	2970
Shrub/Vine	560	841	1121
Grass/Grasslike	252	336	420
Forb	84	112	140
<b>Total</b>	<b>2661</b>	<b>3643</b>	<b>4651</b>

### State 4 Converted

The Converted Land State contains one community, the 4.1 Converted Land Community. The state is characterized by the land manager farming crops or planted grasses.

### Community 4.1 Converted Land





Conversion of this site to cropland occurred from the middle 1800's to the early 1900's. Some remains in cropland today, typically cotton (*Gossypium* spp.), corn (*Zea mays*), sorghum (*Sorghum* spp.), and soybeans (*Glycine max*). Ditching, land leveling, and levee construction has significantly changed the topography and hydrology on many acres of this site. While restoration of this site to a semblance of the reference plant community is possible with seeding and prescribed grazing, complete restoration of the reference community in a reasonable time is very unlikely. Following crop production, this site is often planted to native or introduced grasses and legumes for livestock grazing or hay production. Typical species planted include improved Bermudagrass varieties, bahiagrass, switchgrass, dallisgrass, kleingrass (*Panicum coloratum*), old world bluestems (*Bothriochloa* spp.) annual ryegrass (*Lolium multiflorum*), and white clover. Many of the introduced species (bahagrass, Bermudagrass, and dallisgrass) are invasive-moving by wind, water, and animals. Once established, they are extremely difficult to remove and will hinder the reestablishment of native species. The establishment and maintenance of these species requires cultivation, fertilization, weed control, and prescribed grazing management.

### **Transition T1A** **State 1 to 2**

The Savannah State will transition to the Shrubland State when continued heavy grazing pressure, no brush management, and/or field abandonment continues. The transition is evident when woody species canopy cover exceeds 20 percent and grasses shift composition to more shade-tolerant species.

### **Transition T1B** **State 1 to 4**

The transition to the Converted State occurs when the site is plowed for planting crops or pasture. The driver for the transition is the land manager's decision to farm the site.

### **Restoration pathway R2A** **State 2 to 1**

Restoration back to the Savannah State requires brush management, prescribed grazing and/or prescribed fire. Mechanical or chemical controls can be used to remove the woody overstory species and shrubs. Prescribed grazing may require destocking and/or deferment.

### **Transition T2A** **State 2 to 3**

The Shrubland State will transition to the Woodland State when continued heavy grazing pressure, no brush management, and/or field abandonment continues. The transition is evident when woody species canopy cover exceeds 50 percent and grasses shift composition to more shade-tolerant species.

### **Transition T2B** **State 2 to 4**

The transition to the Converted State occurs when the site is plowed for planting crops or pasture. The driver for the transition is the land manager's decision to farm the site.

## Restoration pathway R3A

### State 3 to 1

Restoration back to the Savannah State requires substantial energy inputs. Brush management and prescribed grazing will be needed to shift the community back to the reference state. Mechanical or chemical controls can be used to remove the woody overstory species back below 20 percent. Prescribed grazing may require destocking and/or deferment to manage the understory grasses back to those found in the reference community. Fire may be an option, but only if adequate amounts of fine fuel exist in the understory.

## Transition T3A

### State 3 to 4

The transition to the Converted State occurs when the site is plowed for planting crops or pasture. The driver for the transition is the land manager's decision to farm the site.

## Restoration pathway R4A

### State 4 to 1

The restoration to State 1 can occur when the land manager ceases agronomic practices. Range planting of native species found in the reference community will be required to bring back a similar community as the State 1 plant composition. The extent of previous soil disturbances will determine how much seedbed preparation will be needed, as well as the ability to be restored. Proper grazing and brush management will be required to ensure success.

## Transition T4A

### State 4 to 3

The Converted Land State will transition to the Woodland State when continued heavy grazing pressure, no brush management, and/or field abandonment continues. The transition is evident when woody species canopy cover exceeds 50 percent and grasses shift composition to more shade-tolerant species.

## Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Tallgrasses</b>			1261–2326	
	big bluestem	ANGE	<i>Andropogon gerardii</i>	1261–2326	–
	switchgrass	PAV12	<i>Panicum virgatum</i>	1261–2326	–
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	1261–2326	–
	Indiangrass	SONU2	<i>Sorghastrum nutans</i>	1261–2326	–
2	<b>Midgrasses</b>			420–869	
	brownseed paspalum	PAPL3	<i>Paspalum plicatulum</i>	420–869	–
	composite dropseed	SPCOC2	<i>Sporobolus compositus var. compositus</i>	420–869	–
3	<b>Midgrasses</b>			252–532	
	splitbeard bluestem	ANTE2	<i>Andropogon ternarius</i>	252–532	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	252–532	–
	silver beardgrass	BOLAT	<i>Bothriochloa laguroides ssp. torreyana</i>	252–532	–
	Florida paspalum	PAFL4	<i>Paspalum floridanum</i>	252–532	–

	purpletop tridens	TRFL2	<i>Tridens flavus</i>	252–532	–
4	<b>Mid/shortgrasses</b>			168–280	
	arrowfeather threeawn	ARPU8	<i>Aristida purpurascens</i>	168–280	–
	cedar sedge	CAPL3	<i>Carex planostachys</i>	168–280	–
	longleaf woodoats	CHSE2	<i>Chasmanthium sessiliflorum</i>	168–280	–
	fall witchgrass	DICO6	<i>Digitaria cognata</i>	168–280	–
	Scribner's rosette grass	DIOLS	<i>Dichantherium oligosanthes</i> var. <i>scribnerianum</i>	168–280	–
	Canada wildrye	ELCA4	<i>Elymus canadensis</i>	168–280	–
	plains lovegrass	ERIN	<i>Eragrostis intermedia</i>	168–280	–
	purple lovegrass	ERSP	<i>Eragrostis spectabilis</i>	168–280	–
	Texas wintergrass	NALE3	<i>Nassella leucotricha</i>	168–280	–
	Florida paspalum	PAFL4	<i>Paspalum floridanum</i>	168–280	–
	Hall's panicgrass	PAHA	<i>Panicum hallii</i>	168–280	–
	vine mesquite	PAOB	<i>Panicum obtusum</i>	168–280	–
	thin paspalum	PASE5	<i>Paspalum setaceum</i>	168–280	–
	longspike tridens	TRST2	<i>Tridens strictus</i>	168–280	–
<b>Forb</b>					
5	<b>Forbs</b>			168–280	
	Virginia dayflower	COVI3	<i>Commelina virginica</i>	168–280	–
	purple prairie clover	DAPUP	<i>Dalea purpurea</i> var. <i>purpurea</i>	168–280	–
	Illinois bundleflower	DEIL	<i>Desmanthus illinoensis</i>	168–280	–
	ticktrefoil	DESMO	<i>Desmodium</i>	168–280	–
	Engelmann's daisy	ENPE4	<i>Engelmannia peristenia</i>	168–280	–
	Maximilian sunflower	HEMA2	<i>Helianthus maximiliani</i>	168–280	–
	lespedeza	LESPE	<i>Lespedeza</i>	168–280	–
	pinkscale blazing star	LIEL	<i>Liatris elegans</i>	168–280	–
	yellow puff	NELU2	<i>Neptunia lutea</i>	168–280	–
	prairie snoutbean	RHLA5	<i>Rhynchosia latifolia</i>	168–280	–
	fuzzybean	STROP	<i>Strophostyles</i>	168–280	–
	prairie spiderwort	TROC	<i>Tradescantia occidentalis</i>	168–280	–
6	<b>Forb</b>			28–84	
	partridge pea	CHFA2	<i>Chamaecrista fasciculata</i>	28–84	–
<b>Shrub/Vine</b>					
7	<b>Shrubs/Vines</b>			168–280	
	Alabama supplejack	BESC	<i>Berchemia scandens</i>	168–280	–
	American beautyberry	CAAM2	<i>Callicarpa americana</i>	168–280	–
	yaupon	ILVO	<i>Ilex vomitoria</i>	168–280	–
	winged sumac	RHCO	<i>Rhus copallinum</i>	168–280	–
	southern dewberry	RUTR	<i>Rubus trivialis</i>	168–280	–
	cat greenbrier	SMGL	<i>Smilax glauca</i>	168–280	–
	coralberry	SYOR	<i>Symphoricarpos orbiculatus</i>	168–280	–

	farkleberry	VAAR	<i>Vaccinium arboreum</i>	168–280	–
	muscadine	VIRO3	<i>Vitis rotundifolia</i>	168–280	–
<b>Tree</b>					
8	<b>Trees</b>			504–841	
	black hickory	CATE9	<i>Carya texana</i>	504–841	–
	common hackberry	CEOC	<i>Celtis occidentalis</i>	504–841	–
	blackjack oak	QUMA3	<i>Quercus marilandica</i>	504–841	–
	post oak	QUST	<i>Quercus stellata</i>	504–841	–
	live oak	QUVI	<i>Quercus virginiana</i>	504–841	–
	gum bully	SILAL3	<i>Sideroxylon lanuginosum</i> ssp. <i>lanuginosum</i>	504–841	–
	elm	ULMUS	<i>Ulmus</i>	504–841	–

## Animal community

The historic savannah provided habitat to bison, deer, turkey, migratory birds and large predators such as wolves, coyotes, mountain lions, and black bear. White-tailed deer, turkey, coyotes, bobcats, and resident and migratory birds find suitable habitat in these savannahs today. Domestic livestock and exotic ungulates are the dominant grazers and browsers of this site. As the savannah transitions through the various vegetative states towards the woodlands, the quality of the habitat may improve for some species and decline for others. Management must be applied to maintain a vegetative state in optimum habitat quality for the desired animal species.

## Hydrological functions

Peak rainfall periods occur in May and June from frontal passage thunderstorms and in September and October from tropical systems as well as frontal passages. Rainfall amounts may be high (three to five per event) and events may become intense. The site is subject to erosion where adequate herbaceous cover is not maintained and on heavy use areas such as roads and livestock trails. Gullies feeding into streams and drains are common on this site where adequate herbaceous cover has not been maintained. Extended periods (60 days) of little to no rainfall during the growing season are common. The hydrology of this site may be manipulated through management to yield higher runoff volumes or greater infiltration to groundwater. Management for less herbaceous cover will favor higher surface runoff while dense herbaceous cover will favor ground water recharge. Potential pollution from sediment, pesticides, and both organic and inorganic fertilizers should always be considered when managing for higher volumes of surface runoff.

## Recreational uses

Hunting, camping, bird watching, equestrian, and photography are common activities.

## Wood products

Oaks are used for firewood. Hickory and mesquite are used for barbecue wood. Yaupon is used for landscaping.

## Other products

Fruit from dewberries, grapes, and plums are harvested.

## Inventory data references

These site descriptions were developed as part a Provisional Ecological Site project using historic soil survey manuscripts, available site descriptions, and low intensity field traverse sampling. Future work to validate the information is needed. This will include field activities to collect low, medium, and high-intensity sampling, soil correlations, and analysis of that data. A final field review, peer review, quality control, and quality assurance review of the will be needed to produce the final document.

## Other references

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## Approval

Bryan Christensen, 9/21/2023

## Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	Mike Stellbauer, David Polk, and Bill Deauman
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Date	06/08/2004
Approved by	Bryan Christensen
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** None.  

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2. **Presence of water flow patterns:** Some water flow patterns may be present on this site due to landscape position and slopes.  

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3. **Number and height of erosional pedestals or terracettes:** Pedestals or terracettes would have been very uncommon for this site when occupied by the reference community.  

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Expect no more than 20 percent bare ground distributed in small patches.  

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5. **Number of gullies and erosion associated with gullies:** Some gullies associated with seeps, springs, and intermittent streams may be present. Head and side slopes should be stable and covered with vegetation.  

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None.  

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7. **Amount of litter movement (describe size and distance expected to travel):** This site has slowly permeable sub-soils. On sloping sites, small to medium-sized litter will move short distances with intense storms.  

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil surface is resistant to erosion. Stability class range is expected to be 3 to 5.  

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The soil surface is less than 10 inches thick with colors from dark brown sandy loam to dark grayish brown sandy loam and generally weak fine granular structure. SOM is 0.5 to 2.0 percent.  

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** The savannah of trees, shrubs, vines, grasses, and forbs, along with adequate litter and little bare ground, provides for maximum infiltration and little runoff under normal rainfall events.  

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None.

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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

Dominant: Warm-season tallgrasses >>

Sub-dominant: Warm-season midgrasses > Trees >

Other: Shrubs/Vines > Forbs

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** There should be little mortality and decadence for any functional group.

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14. **Average percent litter cover (%) and depth ( in):** Litter is primarily herbaceous.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 3,500 pounds per acre for below average moisture years to 5,500 pounds per acre for above average moisture years.

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** Potential invasive species include bahiagrass, common Bermudagrass, mesquite, eastern persimmon, eastern red cedar, post oak, winged elm, and yaupon.

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17. **Perennial plant reproductive capability:** All perennial plants should be capable of reproducing except for periods of prolonged drought conditions, heavy natural herbivory and intense wildfires.

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