USDA Natural Resources Conservation Service

Ecological site R087AY011TX
Loamy Bottomland

Last updated: 9/21/2023
Accessed: 05/21/2025

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.

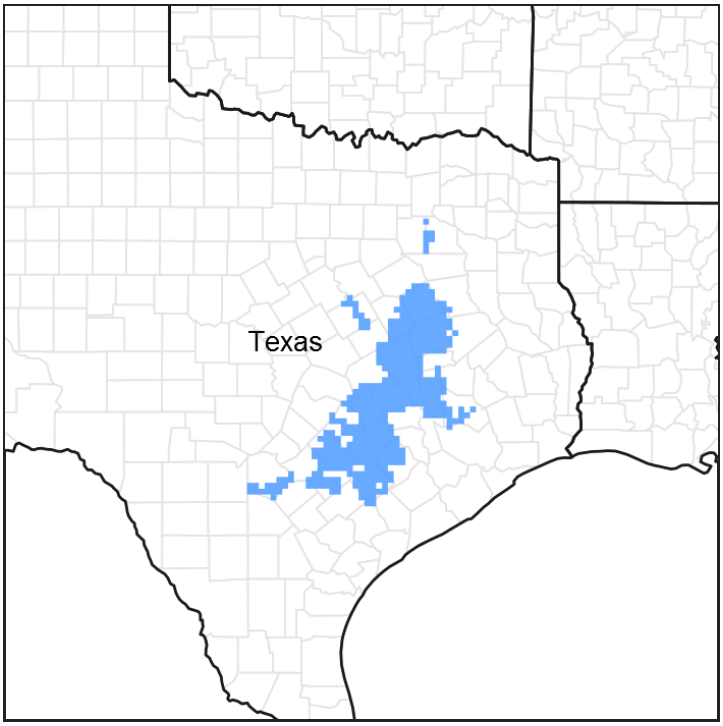


Figure 1. Mapped extent

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 Loamy Bottomlands have soils that are very deep loams and are associated with flooding regimes. The loamy-textured soils allow the water to drain faster than the Clayey Bottomlands, and therefore do not stay inundated as long.

Associated sites

R087AY006TX	**Sandy** Sandy
R087AY010TX	**Sandy Bottomland** Sandy Bottomland
R087AY012TX	**Clayey Bottomland** Clayey Bottomland
R087AY003TX	**Claypan Savannah** Claypan Savannah
R087AY005TX	**Sandy Loam** Sandy Loam

Similar sites

R087AY012TX	**Clayey Bottomland** Clayey Bottomland
R087BY007TX	**Loamy Bottomland** Different MLRA.

Table 1. Dominant plant species

Tree	(1) *Populus deltoides* (2) *Quercus nigra*
Shrub	(1) *Ilex decidua* (2) *Crataegus marshallii*

Herbaceous	(1) *Elymus virginicus* (2) *Carex*

Physiographic features

This site is nearly level to gently sloping and occurs along rivers and streams.

Table 2. Representative physiographic features

Landforms	(1) Plains > Flood plain
Runoff class	Negligible to medium
Flooding duration	Very brief (4 to 48 hours) to long (7 to 30 days)
Flooding frequency	Rare to frequent
Ponding duration	Brief (2 to 7 days) to long (7 to 30 days)
Ponding frequency	Rare to occasional
Elevation	61–229 m
Slope	0–3%
Ponding depth	0–15 cm
Water table depth	84–203 cm
Aspect	Aspect is not a significant factor

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

Influencing water features

This site is adjacent to rivers and streams. It receives overflow from watercourses and runoff from higher adjacent sites.

Wetland description

All soils in this site are hydric and may be wetlands, but onsite delineations are required to make certain.

Soil features

The soils of this site are very deep, loamy textured, and moderately permeable. They usually receive extra water as overflow from watercourses or as runoff from adjacent higher sites. They are, however, better drained than the Clayey Bottomland sites. The plant-soil- water-air relationship is very favorable for plant growth. These factors, together with the natural fertility of the soil, favor high yields of good quality forage. Soils correlated to the site include: Bruno, Coarsewood, Degola, Gaddy, Gowen, Gowker, Hatliff, Highbank, Nahatche, Navidad, Nugent, Pluck, Pulexas, Pursley, Sandow, Uhland, Waelder, Warda, Weswood, Whitesboro, Yahola, and Zavala.

Table 4. Representative soil features

Parent material	(1) Alluvium–sandstone and shale
Surface texture	(1) Fine sandy loam (2) Silty clay loam (3) Clay loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Very slow to moderate

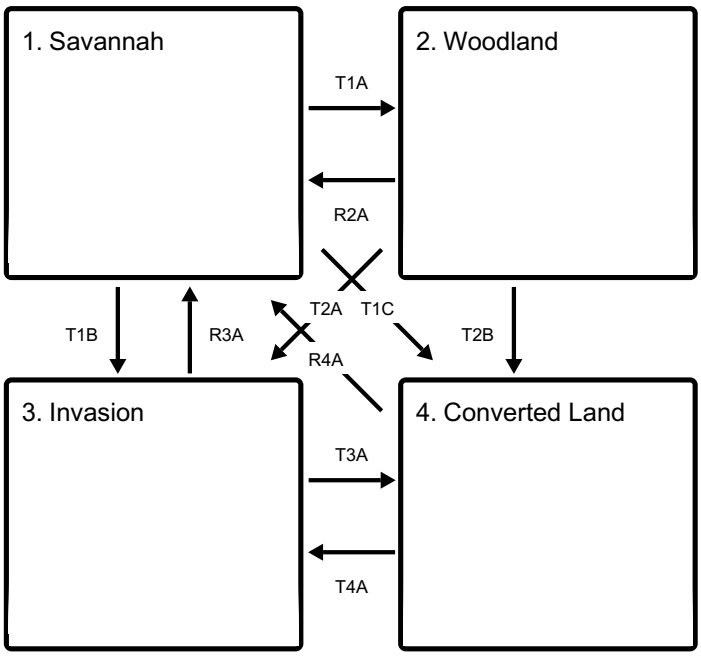
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	12.7–17.78 cm
Calcium carbonate equivalent (0-101.6cm)	0–15%
Electrical conductivity (0-101.6cm)	0–8 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–7
Soil reaction (1:1 water) (0-101.6cm)	4.5–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–6%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

Natural fertility, presence of shade, proximity to water, and nutritious forage make this site a preferred grazing area. The wet nature of the site protects it from grazing at times, but during dry conditions it is often the first site to be overused. Virginia wildrye (*Elymus virginicus*), eastern gamagrass (*Tripsacum dactyloides*), switchcane (*Arundinaria gigantea*), switchgrass (*Panicum virgatum*), and sedges (Carex spp.) decrease in abundance and are replaced by dallisgrass (*Paspalum dilatatum*), common Bermudagrass (*Cynodon dactylon*), and carpetgrass (*Axonopus fissifolius*) as abusive grazing continues. Shrubs and hardwood saplings invade the site in the absence of proper grazing management and brush management. Prolonged mismanagement or abandonment allows the site to become a hardwood forest dominated by water oak (*Quercus nigra*), willow oak (*Quercus phellos*), overcup oak (*Quercus lyrata*), and cedar elm (*Ulmus crassifolia*) on non-calcareous sites or green ash (*Fraxinus pennsylvanica*), cottonwood (Populus spp.), pecan (*Carya illinoinensis*), cedar elm, and sugarberry (*Celtis laevigata*) on calcareous sites.

State and transition model

Ecosystem states



T1A - Heavy continuous grazing, no brush management, no fire

T1B - Invasion by invasive introduced species

T1C - Brush management, crop cultivation, pasture planting

R2A - Brush management, prescribed grazing, fire

T2A - Invasion by invasive introduced species

T2B - Brush management, crop cultivation, pasture planting

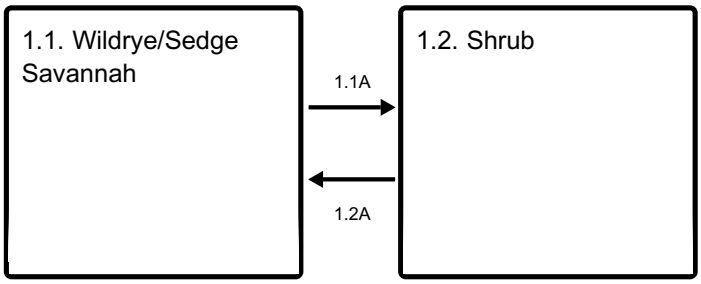
R3A - Brush management, invasive species control, range planting, prescribed grazing

T3A - Brush management, crop cultivation, pasture planting

R4A - Brush management, invasive species control, range planting, prescribed grazing

T4A - Invasion by invasive introduced species

State 1 submodel, plant communities



1.1A - Heavy continuous grazing, no brush management, no fire

1.2A - Brush management, prescribed grazing, fire

State 2 submodel, plant communities

2.1. Ash/Elm Woodland

State 3 submodel, plant communities

3.1. Bermudagrass/Dallisgrass

State 4 submodel, plant communities

4.1. Converted Land

State 1
Savannah

Two communities exist in the Savannah State: the 1.1 Wildrye/Sedge Savannah Community and the 1.2 Shrub Community. Community 1.1 is characterized by tall and midgrass dominating the understory, with 20 percent woody cover by ash and elm. Community 1.2 is characterized by a an increase in shade tolerant grasses and 20 to 40 percent canopy cover of woody species.

Community 1.1
Wildrye/Sedge Savannah

The reference plant community of this site is a savannah. Oak, elm, hackberry, cottonwood, ash, black willow (*Salix nigra*), pecan, and other large trees provide about a 20 percent canopy. The overstory canopy is denser immediately adjacent to the watercourse. The understory may include hawthorn (Crataegus spp.), greenbriar (Smilax spp.), Alabama supplejack (*Berchemia scandens*), peppervine (Ampelopsis arborea), grape (Vitis spp.), trumpet creeper (Parthenocissus spp.), and honeysuckle (*Lonicera japonica*). Sedges, Virginia wildrye, switchcane, broadleaf woodoats (*Chasmanthium latifolium*), and rustyseed paspalum (*Paspalum langei*) in shaded and wet areas dominate the herbaceous plant community. Various combinations of beaked panicum (*Panicum anceps*), switchgrass, Indiangrass, big bluestem (*Andropogon gerardii*) little bluestem (*Schizachyrium scoparium*), eastern gamagrass, vine mesquite (*Panicum obtusum*), and Florida paspalum (*Paspalum floridanum*) may dominate drier, open areas. Continuous yearlong grazing for a succession of years will tend to move the reference herbaceous plant community towards a herbaceous community of common Bermudagrass, dallisgrass, Vasey's grass (*Paspalum urvillei*), carpetgrass, giant ragweed (*Ambrosia trifida*), and annual sumpweed (*Iva annua*). Prescribed grazing may shift this herbaceous community back towards the reference herbaceous species. Continuous yearlong grazing with no weed or brush management or abandoning the site for several years will tend to move towards a shrub-sapling community. Once woody shrubs and saplings invade the site, brush management in some form must be used to move back toward the Savannah State. Prescribed burning is not a viable management tool on this site due to excess fine fuel moisture.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	3363	4203	5044
Tree	1121	1401	1681
Shrub/Vine	560	701	841
Forb	673	757	841
Total	**5717**	**7062**	**8407**

Community 1.2
Shrub

The plant community develops in the absence of proper grazing management and mechanical or chemical brush control 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 cedar elm, water oak, hackberry, pecan, cottonwood, and green ash - honey locust (*Gleditsia triacanthos*), Chinese tallow (Sapium sebiferum), and eastern persimmon (*Diospyros virginiana*) increase in density and canopy coverage (20 to 40 percent). Species whose seeds are windblown (elm, cottonwood, ash) or animal dispersed (persimmon, pecan, Chinese tallow) are the first to colonize and dominate the site. Remnants of Virginia wildrye and eastern gamagrass may still occur but the herbaceous component of the community becomes dominated by lesser producing grasses and forbs. Shade-tolerant species such as broadleaf woodoats, longleaf woodoats (*Chasmanthium sessiliflorum*), Cherokee sedge (*Carex cherokeensis*), ironweed (Veronia baldwinii), buttercup (Ranunculus spp.), and goldenrod (Solidago spp.) are the most abundant species as canopy cover increases. Prescribed burning is not a viable option for returning this community to a savannah due to the moisture content and lack of quantity of the herbaceous fine fuel. Mechanical or chemical brush control as well as prescribed grazing must be applied to move this vegetative state back towards the reference plant community.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Tree	1457	1961	2522
Grass/Grasslike	1289	1737	2186
Shrub/Vine	336	448	560
Forb	280	392	504
Total	**3362**	**4538**	**5772**

Pathway 1.1A
Community 1.1 to 1.2

The Wildrye/Sedge Savannah will transition to the Shrubland Community 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.

Pathway 1.2A
Community 1.2 to 1.1

Restoration back to the Wildrye/Sedge Community requires brush management and prescribed grazing. Mechanical or chemical controls can be used to remove the woody species and shrubs. Prescribed grazing may require destocking and/or deferment.

State 2
Woodland

One community exists in the Woodland State, the Ash/Elm Woodland Community. It is characterized by shade tolerant grasses and an overstory canopy of 40 to 80 percent.

Community 2.1
Ash/Elm Woodland

This plant community is a closed overstory (40 to 80 percent) woodland dominated by green ash, cedar elm, overcup oak, water oak, willow oak, pecan, cottonwood, sycamore (Plantanus occidentalis), and black willow. Understory shrubs and sub-shrubs include yaupon, farkleberry (*Vaccinium arboreum*), possumhaw (*Ilex decidua*), American beautyberry (*Callicarpa americana*), and hawthorn (Crataegus spp.). Woody vines also occur and include Alabama supplejack (*Berchemia scandens*), poison ivy (*Toxicodendron radicans*), grape (Vitis spp.), greenbrier (Smilax spp.), trumpet creeper, Virginia creeper (*Parthenocissus quinquefolia*), and peppervine (Ampelopsis arborea). The herbaceous understory is composed of shade-tolerant species including longleaf woodoats, broadleaf woodoats, sedges, ironweed, and ice plant (*Verbesina lindheimeri*). Switchcane, eastern gamagrass, and goldenrod may occur in small amounts. Prescribed fire is not a viable treatment option for conversion of this site back to a semblance of the Wildrye/Sedge Savannah because of lack of fine fuel and high fine fuel moisture. Chemical brush control on a large scale is not a treatment option, however, individual plant treatment with herbicides on small acreages may be a viable option. Mechanical treatment of this site, along with seeding, is the most viable treatment option although probably not economical.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Tree	3138	4315	5492
Shrub/Vine	729	1009	1289
Grass/Grasslike	336	448	560
Forb	112	168	224
Total	**4315**	**5940**	**7565**

State 3
Invasion

One community exists in the Invasion State, the Bermudagrass/Dallisgrass Community. It is characterized by an invasion by tame pasture grasses. The invasive species may have been planted for agriculture purposes or they may have invaded from nearby pastures.

Community 3.1
Bermudagrass/Dallisgrass

The herbaceous community is dominated by common Bermudagrass, dallisgrass, Vasey's grass, carpetgrass, giant ragweed, and annual sumpweed. White clover (Trifloium repens), vetch (*Vicia sativa*), and annual ryegrass (Lolium multiflorum) may also occur. This community develops from years of heavy continuous grazing. Prescribed grazing may shift this community back towards the Wildrye/Sedge Savannah Community, but total restoration may not be possible as invasive species are hard to control.

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2242	2802	3363
Forb	1121	1401	1681
Tree	897	1233	1569
Shrub/Vine	224	308	392
Total	**4484**	**5744**	**7005**

State 4
Converted Land

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 (primarily cotton) 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, eastern gamagrass, annual ryegrass (Lolium multiflorum), and white clover. Many of the introduced species (bahiagrass, 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 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 40 percent and grasses shift composition to more shade-tolerant species.

Transition T1B
State 1 to 3

The Savannah State will transition to the Invasion State when continuous, yearlong heavy grazing occurs, coupled with the invasion of species like Bermudagrass and Dallisgrass.

Transition T1C
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 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.

Transition T2A
State 2 to 3

The Woodland State will transition to the Invasion State when invasion by species like Bermudagrass and Dallisgrass occur. These species will invade from nearby pastures and compete with native vegetation.

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. If woody species are present, chemical or mechanical brush management will be required. Range planting may be required if invasive species have taken over completely. Total restoration back to the reference community may not be possible due to the challenge of completely removing invasive species from the community.

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 Invasion State when continued heavy grazing pressure, no brush management, and/or field abandonment occurs. The transition is evident when forbs, shrubs, and woody species begin to limit the production of planted crops or pasture grasses.

Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Midgrasses**			1681–2522	
	sedge	CAREX	*Carex*	1681–2522	–
	Virginia wildrye	ELVI3	*Elymus virginicus*	1681–2522	–
	rustyseed paspalum	PALA11	*Paspalum langei*	1681–2522	–
2	**Tallgrasses**			1121–1681	
	big bluestem	ANGE	*Andropogon gerardii*	1121–1681	–
	beaked panicgrass	PAAN	*Panicum anceps*	1121–1681	–
	switchgrass	PAVI2	*Panicum virgatum*	1121–1681	–
	little bluestem	SCSC	*Schizachyrium scoparium*	1121–1681	–
	Indiangrass	SONU2	*Sorghastrum nutans*	1121–1681	–
	eastern gamagrass	TRDA3	*Tripsacum dactyloides*	1121–1681	–
3	**Mid/Shortgrasses**			560–841	
	buffalograss	BODA2	*Bouteloua dactyloides*	560–841	–
	Indian woodoats	CHLA5	*Chasmanthium latifolium*	560–841	–
	longleaf woodoats	CHSE2	*Chasmanthium sessiliflorum*	560–841	–
	deertongue	DICL	*Dichanthelium clandestinum*	560–841	–
	twoflower melicgrass	MEMU	*Melica mutica*	560–841	–
	Texas wintergrass	NALE3	*Nassella leucotricha*	560–841	–
	Florida paspalum	PAFL4	*Paspalum floridanum*	560–841	–

	paspalum				
	Hall's panicgrass	PAHA	*Panicum hallii*	560–841	–
	vine mesquite	PAOB	*Panicum obtusum*	560–841	–
	brownseed paspalum	PAPL3	*Paspalum plicatulum*	560–841	–
	thin paspalum	PASE5	*Paspalum setaceum*	560–841	–
	marsh bristlegrass	SEPA10	*Setaria parviflora*	560–841	–
	composite dropseed	SPCOC2	*Sporobolus compositus var. compositus*	560–841	–
	gaping grass	STHI3	*Steinchisma hians*	560–841	–
	purpletop tridens	TRFL2	*Tridens flavus*	560–841	–
Forb					
4	**Forbs**			644–785	
	partridge pea	CHFA2	*Chamaecrista fasciculata*	644–785	–
	ticktrefoil	DESMO	*Desmodium*	644–785	–
	lespedeza	LESPE	*Lespedeza*	644–785	–
	prairie snoutbean	RHLA5	*Rhynchosia latifolia*	644–785	–
	fuzzybean	STROP	*Strophostyles*	644–785	–
5	**Forbs**			28–56	
	great ragweed	AMTR	*Ambrosia trifida*	28–56	–
	annual marsh elder	IVAN2	*Iva annua*	28–56	–
	giant goldenrod	SOGI	*Solidago gigantea*	28–56	–
	Baldwin's ironweed	VEBA	*Vernonia baldwinii*	28–56	–
	white crownbeard	VEVI3	*Verbesina virginica*	28–56	–
Shrub/Vine					
6	**Shrubs/Vines**			560–841	
	Alabama supplejack	BESC	*Berchemia scandens*	560–841	–
	American beautyberry	CAAM2	*Callicarpa americana*	560–841	–
	parsley hawthorn	CRMA5	*Crataegus marshallii*	560–841	–

	possumhaw	ILDE	*Ilex decidua*	560–841	–
	yaupon	ILVO	*Ilex vomitoria*	560–841	–
	oakwoods dewberry	RULA5	*Rubus largus*	560–841	–
	saw greenbrier	SMBO2	*Smilax bona-nox*	560–841	–
	cat greenbrier	SMGL	*Smilax glauca*	560–841	–
	muscadine	VIRO3	*Vitis rotundifolia*	560–841	–
Tree					
7	**Trees**			1121–1681	
	bitternut hickory	CACO15	*Carya cordiformis*	1121–1681	–
	pecan	CAIL2	*Carya illinoinensis*	1121–1681	–
	eastern redbud	CECA4	*Cercis canadensis*	1121–1681	–
	sugarberry	CELAL	*Celtis laevigata var. laevigata*	1121–1681	–
	green ash	FRPE	*Fraxinus pennsylvanica*	1121–1681	–
	eastern cottonwood	PODE3	*Populus deltoides*	1121–1681	–
	water oak	QUNI	*Quercus nigra*	1121–1681	–
	willow oak	QUPH	*Quercus phellos*	1121–1681	–
	black willow	SANI	*Salix nigra*	1121–1681	–
	bald cypress	TADI2	*Taxodium distichum*	1121–1681	–
	cedar elm	ULCR	*Ulmus crassifolia*	1121–1681	–

Animal community

Historically, the Loamy Bottomland site provided habitat to bison, deer, turkey, migratory birds and large predators such as wolves, coyotes, mountain lions, and black bear. White-tailed deer, turkey, fox and gray squirrels, coyotes, bobcats, and migratory birds find suitable habitat in these savannahs today. The favorable moisture regime of this site attracts many species of wildlife during the hot dry summer months when the quality and quantity of forages on upland sites may be lacking. Where old mast producing oaks and pecan trees are present, this site provides habitat for deer, turkey, squirrels, and ducks - especially during the winter. As the savannah transitions through the various vegetative states, the quality of the habitat may improve for some species and decline for others. Management must be applied to maintain a plant community 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 inches per event) and events may be intense. The site is subject to erosion along adjacent stream banks where adequate herbaceous cover is not maintained and on heavy use areas such as roads and livestock trails. Extended periods (60 days) of little to no rainfall during the growing season are common. The site may be periodically inundated from overflow water from adjacent watercourses and may be ponded or saturated for long periods. This site may be a wetland or contain wetland inclusions as oxbows or stream meanders.

Recreational uses

Hunting, camping, bird watching, and equestrian are popular activities.

Wood products

Water oak and willow oak provides material for hardwood flooring, plywood, veneer, and cross-ties. Green ash is used for bats, tool handles, and furniture. Post oak and water oak are used for firewood. Rattan is used for furniture.

Other products

Fruit from blackberries, grapes, and plums and nuts from pecans 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

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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
Contact for lead author	Mike Stellbauer, Zone RMS, NRCS, Bryan, Texas
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:** Water flow patterns are common and follow old stream meanders. Deposition or erosion is uncommon for normal rainfall but may occur during intense rainfall events.

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3. **Number and height of erosional pedestals or terracettes:** Pedestals or terracettes are 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 randomly distributed throughout.

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5. **Number of gullies and erosion associated with gullies:** Some gullies associated with side drains into the perennial streams may be present. Gullies should be vegetated and stable.

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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 is a flood plain with occasional out-of-bank flow. Under normal rainfall, little litter movement should be expected; however, litter of all sizes may move long distances, depending on obstructions, under intense storm events.

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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 under reference conditions is resistant to erosion. Stability class range is expected to be 4 to 6.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface structure is 0 to 45 inches thick with colors from reddish brown sandy clay loam to dark grayish brown loams and clay loams and structures from weak, fine, granular to weak fine granular blocky. SOM is approximately 0.5 to 3.0 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 wtih adequate litter and little bare ground, provides for maximum infiltration and little runoff under 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 > Cool-season midgrasses >>

    Sub-dominant:

    Other: Trees > 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 or decadence for any functional groups.

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14. **Average percent litter cover (%) and depth (in):** Small to large woody litter is common on this site.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 5,000 pounds per acre for below average moisture year to 7,500 pounds per acre for above average moisture year.

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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 Chinese tallow, huisache, honey locust, bois d'arc, elm, ash, McCartney rose, dallisgrass, Bermudagrass, Johnsongrass, annual sumpweed and giant ragweed.

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