

Ecological site R086BY005TX Blackland

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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.

MLRA notes

Major Land Resource Area (MLRA): 086B–Texas Blackland Prairie, Southern Part

MLRA 86B, the Southern Part of the Texas Blackland Prairie is located in east-central Texas. It makes up about 2,925 square miles (7,585 square kilometers). The towns of Brenham, Caldwell, La Grange, Schulenberg, Hallettsville, and Navasota are in the eastern part while Lincoln, Benchley, and Normangee are in the western part. The area supports tall and mid-grass prairies, but improved pasture, croplands, and urban development account for the majority of the acreage.

Classification relationships

USDA-Natural Resources Conservation Service, 2006. -Major Land Resource Area (MLRA) 86B

Ecological site concept

The Blackland ecological site is distinguished by its deep productive soils that are richly black in color, and characterized by their shrink-swell nature. The sites are widely distributed across the region.

Associated sites

R086BY001TX	Chalky Ridge The Chalky Ridge site is often upslope from the Blackland. It differs from the site by having shallow soils and low soil fertility.
R086BY002TX	Claypan Prairie The Claypan Prairie site is often adjacent to the Blackland. It differs from the site by having a sandy loam surface soil layer over clay subsoils.
R086BY006TX	Loamy Bottomland The Blackland Site occurs at higher elevation in the drainage and provides runoff to the Loamy Bottomland Site.
R086BY007TX	Clayey Bottomland The Blackland Site occurs at higher elevation in the drainage and provides runoff to the Clayey Bottomland Site.

Similar sites

R086BY004TX	Eroded Blackland The Eroded Blackland site is similar to the Blackland site by having similar soil types and topography. It differs by having extensive erosion indicated by a partial or lost A horizon, active rills and/or gullies, and lower production.
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Table 1. Dominant plant species

Tree	(1) <i>Celtis laevigata</i> var. <i>reticulata</i> (2) <i>Ulmus crassifolia</i>
Shrub	(1) <i>Symphoricarpos orbiculatus</i>
Herbaceous	(1) <i>Schizachyrium scoparium</i> (2) <i>Andropogon gerardii</i>

Physiographic features

This site includes nearly level, moderately sloping, gently rolling, and hilly topography. Slopes range from 0 to 8 percent, but are typically 1 to 5 percent.

Table 2. Representative physiographic features

Landforms	(1) Plains > Terrace (2) Plains > Ridge
Runoff class	High to very high
Flooding frequency	None
Ponding frequency	None
Elevation	60 – 150 m
Slope	0 – 10 %
Aspect	Aspect is not a significant factor

Table 3. Representative physiographic features (actual ranges)

Runoff class	Not specified
Flooding frequency	Not specified
Ponding frequency	Not specified

Elevation	Not specified
Slope	0 – 10 %

Climatic features

The climate for MLRA 86B is humid subtropical and is characterized by hot summers, especially in July and August, and relatively mild winters. Tropical maritime air controls the climate during spring, summer and fall. In winter and early spring, frequent surges of Polar Canadian air cause sudden drops in temperatures and add considerable variety to the daily weather. When these cold air masses stagnate and are overrun by moist air from the south, several days of cold, cloudy, and rainy weather follow. Generally, these occasional cold spells are of short duration with rapid clearing following cold frontal passages. 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 sunny skies, mild days, and cool nights. Rainfall during the spring and summer months generally falls during thunderstorms, and fairly large amounts of rain may fall in a short time. High intensity rains of short duration are likely to produce rapid runoff almost anytime during the year. The amount of rain that falls varies considerably from month-to-month and from year-to-year.

Table 4 Representative climatic features

Frost-free period (average)	250 days
Freeze-free period (average)	280 days
Precipitation total (average)	1,070 mm

- (1) LEXINGTON [USC00415193], Lexington, TX
- (2) BRENHAM [USC00411048], Brenham, TX
- (3) FLATONIA 4SE [USC00413183], Moulton, TX
- (4) WASHINGTON SP [USC00419491], Navasota, TX
- (5) HALLETTSVILLE 2 N [USC00413873], Hallettsville, TX

Influencing water features

The plant community of this site is not influenced by a stream.

Wetland description

Wetlands are not associated with this site.

Soil features

These soils are deep, dark colored to olive, slightly acid to calcareous clays. The soils have high shrink-swell properties often forming microdepressions and microknolls. When they are dry and cracked, they take in water rapidly. When they are wet and the cracks have closed, however, the water intake is slow. The soils hold large amounts of water and have high natural fertility. They seal over when cover is inadequate and erosion is then a hazard. The soils are sticky and plastic when wet. When moist, they are crumbly. Good soil structure is generally very evident under grass cover. In this condition, they favor air and water movement and root growth.

Soils correlated to this site include: Bleiberville, Branyon, Denhawken, Denvaca, Dimebox, Elmendorf, Elmenwood, Frelsburg, Greenvine, Heiden, Houston Black, Leson, and Luling.

Table 5. Representative soil features

Parent material	(1) Residuum – shale
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Surface texture	(1) Clay
Family particle size	(1) Clayey
Drainage class	Moderately well drained to well drained
Soil depth	200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	15.24 – 25.4 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 40 %
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	5.6 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	Not specified
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

This tallgrass prairie site evolved and was maintained by the grazing and herding effects of native large ungulates, by rodents and rabbits, by insects and disease, and the occurrence of periodic fire. Extreme climatic fluctuations over time may also have been important in the maintenance of the historic plant community. Continuous overgrazing by confined domestic livestock and the suppression of fire

degrades the plant community. Continuous grazing will remove big bluestem (*Andropogon gerardii*), Indiangrass (*Sorghastrum nutans*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), and preferred forbs such as Engelmann's daisy (*Engelmannia peristenia*), Maximilian sunflower (*Helianthus maximilliani*), Illinois bundleflower (*Desmanthus illinoensis*), and compass plant (*Silphium* spp.). These plants will be replaced by less productive perennial and annual grasses and forbs including silver bluestem (*Bothriochloa saccharoides*), Texas wintergrass (*Nassella leucotricha*), windmillgrass (*Chloris* spp.), white tridens (*Tridens albescens*), annual broomweed (*Amphiachyris dracunculoides*), and snow on the prairie (*Euphorbia bicolor*). With continued continuous grazing and the absence of periodic fire, a community dominated by woody species including mesquite (*Prosopis glandulosa*), cedar elm (*Ulmus crassifolia*), netleaf hackberry (*Celtis laevigata*), and eastern red cedar (*Juniperus virginiana*) will replace the grassland.

State and transition model

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	Tallgrass			1681-3363	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	1681-3363	–
2	Tallgrasses			841-1681	
	big bluestem	ANGE	<i>Andropogon gerardii</i>	841-1681	–
	Indiangrass	SONU2	<i>Sorghastrum nutans</i>	841-1681	–
3	Mid/Shortgrasses			336-673	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	336-673	–
	buffalograss	BODA2	<i>Bouteloua dactyloides</i>	336-673	–
	silver beardgrass	BOLAT	<i>Bothriochloa laguroides</i> ssp. <i>torreyana</i>	336-673	–
	sedge	CAREX	<i>Carex</i>	336-673	–
	cylinder jointtail grass	COCY	<i>Coelorachis cylindrica</i>	336-673	–
	fall witchgrass	DICO6	<i>Digitaria cognata</i>	336-673	–
	Virginia wildrye	ELVI3	<i>Elymus virginicus</i>	336-673	–
	Texas cupgrass	ERSE5	<i>Eriochloa sericea</i>	336-673	–
	Texas wintergrass	NALE3	<i>Nassella leucotricha</i>	336-673	–
	Florida paspalum	PAFL4	<i>Paspalum floridanum</i>	336-673	–
	Hall's panicgrass	PAHA	<i>Panicum hallii</i>	336-673	–
	vine mesquite	PAOB	<i>Panicum obtusum</i>	336-673	–
	switchgrass	PAVI2	<i>Panicum virgatum</i>	336-673	–
	marsh bristlegrass	SEPA10	<i>Setaria parviflora</i>	336-673	–
	composite dropseed	SPCOC2	<i>Sporobolus compositus</i> var. <i>compositus</i>	336-673	–
	white tridens	TRAL2	<i>Tridens albescens</i>	336-673	–
	eastern gamagrass	TRDA3	<i>Tripsacum dactyloides</i>	336-673	–
	longspike tridens	TRST2	<i>Tridens strictus</i>	336-673	–
Forb					
4	Forbs			336-673	
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	336-673	–
	groovestem Indian plantain	ARPL4	<i>Arnoglossum plantagineum</i>	336-673	–
	bluebell bellflower	CARO2	<i>Campanula rotundifolia</i>	336-673	–
	compact prairie clover	DACOC	<i>Dalea compacta</i> var. <i>compacta</i>	336-673	–
	Illinois bundleflower	DEIL	<i>Desmanthus illinoensis</i>	336-673	–
	blacksamson echinacea	ECAN2	<i>Echinacea angustifolia</i>	336-673	–
	Engelmann's daisy	ENPE4	<i>Engelmannia peristenia</i>	336-673	–
	button eryngo	ERYU	<i>Eryngium yuccifolium</i>	336-673	–

	Maximilian sunflower	HEMA2	<i>Helianthus maximiliani</i>	336-673	–
	coastal indigo	INMI	<i>Indigofera miniata</i>	336-673	–
	pinkscale blazing star	LIEL	<i>Liatris elegans</i>	336-673	–
	Nuttall's sensitive-briar	MINU6	<i>Mimosa nuttallii</i>	336-673	–
	whitest evening primrose	OEAL	<i>Oenothera albicaulis</i>	336-673	–
	Nuttall's prairie parsley	PONU4	<i>Polytaenia nuttallii</i>	336-673	–
	prairie snoutbean	RHLA5	<i>Rhynchosia latifolia</i>	336-673	–
	fuzzybean	STROP	<i>Strophostyles</i>	336-673	–
Shrub/Vine					
5	Vines			34-67	
	coralberry	SYOR	<i>Symphoricarpos orbiculatus</i>	34-67	–
Tree					
6	Trees			168-336	
	netleaf hackberry	CELAR	<i>Celtis laevigata var. reticulata</i>	168-336	–
	gum bully	SILAL3	<i>Sideroxylon lanuginosum ssp. lanuginosum</i>	168-336	–
	cedar elm	ULCR	<i>Ulmus crassifolia</i>	168-336	–

Table 7. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	Small Grains			6725-8967	
	common oat	AVSA	<i>Avena sativa</i>	6725-8967	–
	Italian ryegrass	LOPEM2	<i>Lolium perenne ssp. multiflorum</i>	6725-8967	–
	common wheat	TRAЕ	<i>Triticum aestivum</i>	6725-8967	–
2	Pastureland Species			3363-11208	
	Bermudagrass	CYDA	<i>Cynodon dactylon</i>	3363-11208	–
	kleingrass	PACO2	<i>Panicum coloratum</i>	3363-11208	–
	bahiagrass	PANO2	<i>Paspalum notatum</i>	3363-11208	–

Animal community

As a historic tall grass prairie, this site was occupied by bison, antelope, deer, prairie chickens, quail, turkey, and dove. This site was also used by many species of grassland songbirds, migratory waterfowl, coyotes, and wolves. This site now provides forage for livestock and is still used by quail, dove, migratory waterfowl, migratory and resident grassland birds, and coyotes. Deer use the site when mesquite and associated woody species occur in sufficient densities and proper structure to provide adequate cover.

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 passage thunderstorms. Rainfall amounts may be high (three to five inches per event) and events may be 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. Extended periods (60 days) of little to no rainfall during the growing season are common.

Recreational uses

The site is used for hunting, fishing, and photography.

Wood products

Mesquite may be harvested for firewood, charcoal, and specialty uses including furniture, gun stocks, and veneer.

Other products

Hay, seed from native grasses, forbs, and legumes

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

Diggs, G.M., B.L. Lipscomb, and R.J. O'Kennon. 1999. Illustrated Flora of North Central Texas Botanical Research Institute of Texas and Austin College, Fort Worth, TX.

Hatch, S.L, K.N. Gandhi, and L.E. Brown. 1990. Checklist of the vascular plants of Texas. Texas Agricultural Experiment Station, College Station, TX.

Contributors

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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.

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Approved by	
Approval date	

Composition (Indicators 10 and 12) based on	Annual Production
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Indicators

- 1. Number and extent of rills:** A few rills of small extent may naturally occur on this site.

- 2. Presence of water flow patterns:** Some water flow patterns are normal for this site due to landscape position and slope but should be vegetated and stable.

- 3. Number and height of erosional pedestals or terracettes:** Pedestals or terracettes are uncommon for this site when occupied by the reference community.

- 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.

- 5. Number of gullies and erosion associated with gullies:** No gullies should be present. Drainageways should be stable and covered with vegetation.

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

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

- 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 5 to 6.

- 9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface structure is greater than 60 inches. Colors range from black to very dark brown and moderate fine to medium subangular block structure. SOM is one to three percent.

- 10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** This prairie site is dominated by tallgrasses and forbs, with adequate litter and little bare ground, which provides for maximum infiltration and little runoff under normal rainfall events.

11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): No evidence of compaction.
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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 > Cool-season midgrasses > Forbs >

Other: Trees > Shrubs/Vines

Additional:

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 group for the reference community.
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14. Average percent litter cover (%) and depth (in):
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15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production): 4,500 pounds per acre during below average moisture years to 7,500 pounds per acre during 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 yellow bluestems, common Bermudagrass, mesquite, elm, huisache, eastern red cedar, and osage orange.
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17. Perennial plant reproductive capability: All perennial plants should be capable of reproducing, except during drought conditions, heavy natural herbivory, and intense wildfires.
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