Ecological site R087BY004TX
Sandy

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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): 087B–Texas Claypan Area, Northern Part

This area is in northeastern Texas (79 percent) and southeastern Oklahoma (21 percent). It makes up about 4,480 square miles (11,610 square kilometers). The towns of Greenville, Sulphur Springs, Paris, Mount Vernon, Canton, and Athens, Texas, and Durant, Oklahoma, are in this MLRA. Interstates 30 and 20 and Highways 69, 70, 80, and 82 cross the area. The Caddo National Grasslands is in the north end of the area.

Classification relationships

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

Ecological site concept

The Sandy sites are characterized by a sandy surface layer that extends 20 to 40 inches to a sandy clay loam subsurface layer. The sites are more productive and less droughty than soils with deeper sands, but not as productive as soils with a higher clay content.

Associated sites

R087BY006TX	**Very Deep Sand**
R087BY003TX	**Sandy Loam**
R087BY005TX	**Deep Sand**

Similar sites

R087AY006TX	**Sandy**

Table 1. Dominant plant species

Tree	(1) *Quercus stellata* (2) *Quercus marilandica*

Shrub	Not specified
Herbaceous	(1) *Schizachyrium scoparium* (2) *Sorghastrum nutans*

Physiographic features

These soils are on gently sloping to strongly sloping ridges and stream terraces. Slopes range from 1 to 15 percent. Runoff is very low due to the sandy nature of the soils.

Table 2. Representative physiographic features

Landforms	(1) Plains > Interfluve
Runoff class	Very low to low
Flooding frequency	None
Ponding frequency	None
Elevation	80 – 230 m
Slope	0 – 20 %
Water table depth	150 – 200 cm
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation is 47 inches in most of this area, but it can be higher or lower depending on the exact location. Most of the rainfall occurs in spring and winter. The average annual temperature is 62 to 66 degrees F. The freeze-free period averages 235 days and frost-free period averages 210 days.

Table 3 Representative climatic features

Frost-free period (average)	210 days
Freeze-free period (average)	240 days
Precipitation total (average)	1,190 mm

- (1) EMORY [USC00412902], Emory, TX
- (2) LAKE FORK RSVR [USC00414976], Quitman, TX

- (3) MT PLEASANT [USC00416108], Mount Pleasant, TX
- (4) BONHAM 3NNE [USC00410923], Bonham, TX
- (5) DENISON DAM [USC00412394], Cartwright, TX
- (6) MT VERNON [USC00416119], Mount Vernon, TX
- (7) BOSWELL 1 S [USC00340980], Boswell, OK
- (8) DURANT [USC00342678], Durant, OK
- (9) CLARKSVILLE 2NE [USC00411772], Clarksville, TX
- (10) PARIS [USC00416794], Paris, TX

Influencing water features

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

Wetland description

Wetlands are not associated with this site.

Soil features

The soils are very deep, loamy fine sands with a surface 20 to 40 inches thick over sandy clay loam subsoils. Water soaks rapidly into the porous soils. Even light showers penetrate below the evaporation zone and are more effective on this site than sites with deeper sands. Water retention is relatively low but the soils give up a high percent of their moisture to growing plants. Although air, water, and plant roots move through the soil with ease, frequent rains are needed to produce optimum plant growth. Inherent low fertility causes these soils to produce forage of lower quantity than associated sites with higher clay content. The site is subject to erosion where adequate herbaceous cover is not maintained and on heavy use areas such as roads and livestock trails. Wolfpen is the representative soil with a taxonomic classification of loamy, siliceous, semiactive, thermic Arenic Paleudalf.

Table 4. Representative soil features

Parent material	(1) Residuum – sandstone and shale
Surface texture	(1) Loamy sand
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow
Soil depth	200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	7.62 – 10.16 cm

Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	4.5 – 6.5
Subsurface fragment volume <=3" (Depth not specified)	Not specified
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

The Sandy 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, and fertility and allowed woody species to dominate the site. Continuous grazing by confined domestic livestock and the suppression of fire on non-cropland sites removes little bluestem (Schizachyrium scoparium), Indiangrass (Sorghastrum nutans), switchgrass (Panicum virgatum), and preferred forbs such as tephrosia (Tephrosia spp.) and prairie clover (Dalea spp.).

Less productive perennial and annual grasses and forbs will replace these plants. Years of continuous grazing generally lead to periods of prolonged rest for recovery of the perennial herbaceous plant component. These prolonged rest periods with no fire or brush management lead toward a community dominated by woody species such as winged elm (Ulmus alata), yaupon (Ilex vomitoria), post oak (Quercus stellata), and eastern red cedar (Juniperus virginiana).

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 7. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 8. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

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 migratory birds find suitable habitat in these savannahs today. Domestic livestock and exotic ungulates are the dominant grazers and browsers on 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 inches per event) and events may be intense. Extended periods (60 days) of little to no rainfall during the growing season are common. Because of the gently sloping to sloping topography with a rapid intake rate of the surface sands and very rapid permeability of the soils, there is usually little to no runoff on this site. Water from these somewhat excessively drained soils provides groundwater recharge.

Recreational uses

Hunting, camping, bird watching, and equestrian are all 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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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.

Author(s)/participant(s)	
Contact for lead author	
Date	09/13/2026
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

   _____

2. **Presence of water flow patterns:**

   _____

3. **Number and height of erosional pedestals or terracettes:**

   _____

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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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):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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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):**

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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:

    Sub-dominant:

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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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):**

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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:**

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17. **Perennial plant reproductive capability:**
