

Ecological site R083CY017TX

Blackland

Last updated: 9/19/2023
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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): 083C–Central Rio Grande Plain

Major Land Resource Area (MLRA) 83C makes up about 4,275 square miles (11,075 square kilometers). The towns of Freer, George West, and Hebbronville are in this area. The town of Alice is on the east edge of the area. U.S. Highways 59 and 281 cross the area. This area is comprised of inland, dissected coastal plains.

Classification relationships

USDA-Natural Resources Conservation Service, 2006. -Major Land Resource Area (MLRA) 83C

Ecological site concept

The Blackland ecological site shows an intact grass community with small clumped dispersal of woody species. The soils are moderately deep to very deep, richly black in color, and characterized by their shrink-swell nature. The sites are widely distributed across the uplands and terraces throughout the region.

Associated sites

R083CY002TX	Shallow Ridge
R083CY019TX	Gray Sandy Loam
R083CY023TX	Sandy Loam

Similar sites

R083AY017TX	Blackland
R083BY017TX	Blackland

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Schizachyrium scoparium</i> (2) <i>Sorghastrum nutans</i>

Physiographic features

These soils are on nearly level to very gently sloping interfluves on inland, dissected coastal plains. Slopes range from 0 to 5 percent.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Interfluve
Runoff class	High to very high
Flooding frequency	None
Ponding frequency	None
Elevation	30 – 240 m
Slope	0 – 10 %
Aspect	Aspect is not a significant factor

Climatic features

MLRA 83C is subtropical, subhumid on the western boundary and subtropical humid on the eastern boundary. Winters are dry and mild, and the summers are hot and humid. Tropical maritime air masses predominate throughout spring, summer, and fall. Modified polar air masses exert considerable influence during winter, creating a continental climate characterized by large variations in temperature. Peak rainfall, because of rain showers, occurs late in spring and a secondary peak occurs early in fall. Heavy thunderstorm activities increase in April, May, and June. July is hot and dry with little weather variations. Rainfall increases again in late August and September as tropical disturbances increase and become more frequent. Tropical air masses from the Gulf of Mexico dominate during the spring, summer, and fall. Prevailing winds are southerly to southeasterly throughout the year except in December when winds are predominately northerly.

Table 3 Representative climatic features

Frost-free period (characteristic range)	260-290 days
Freeze-free period (characteristic range)	370 days
Precipitation total (characteristic range)	580-660 mm

Frost-free period (actual range)	260-350 days
Freeze-free period (actual range)	370 days
Precipitation total (actual range)	530-660 mm
Frost-free period (average)	280 days
Freeze-free period (average)	370 days
Precipitation total (average)	640 mm

- (1) FREER [USC00413341], Freer, TX
- (2) CALLIHAM [USC00411337], Calliham, TX
- (3) HEBBRONVILLE [USC00414058], Hebbronville, TX
- (4) CHOKE CANYON DAM [USC00411720], Three Rivers, TX
- (5) MCCOOK [USC00415721], Edinburg, TX

Influencing water features

Water features do not influence this site.

Wetland description

N/A.

Soil features

The soils are very deep, well drained, very slowly permeable. These soils formed in clayey sediments. Soil series Danjer and Monteola are correlated to this site.

Table 4. Representative soil features

Parent material	(1) Alluvium – shale (2) Residuum – shale
Surface texture	(1) Clay (2) Clay loam
Family particle size	(1) Fine
Drainage class	Moderately well drained
Permeability class	Very slow

Soil depth	200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	15.24 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 30 %
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	7.9 – 8.9
Subsurface fragment volume <=3" (Depth not specified)	Not specified
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

Climatic variation and topoedaphic heterogeneity interact to influence vegetation responses to disturbances such as fire and grazing. Plants of the reference plant community evolved with and are generally well adapted to grazing and fire. Prior to European settlement, fires would likely have been frequent, between 5 and 10 years. These fires would have resulted from lightning during the hot, dry summer months or were set by Native Americans. The occurrence of fire promotes grasses while making it difficult for woody plants to achieve dominance. During the Pleistocene, there were significant populations of large-bodied grazers and browsers. Most of these went extinct, so that by the Holocene (about 10,000 years ago) only bison (*Bos bison*), white-tailed deer (*Odocoileus virginianus*), and antelope (*Antilocapra americana*) remained. Archeological evidence indicates that bison occurred in the region, but there is also evidence of centuries of absence. In addition, their numbers may have varied seasonally as herds migrated. When present, bison may have grazed certain areas heavily, but then moved on. Activities of other native herbivores (termites, cutter ants, soil nematodes, kangaroo rats (*Dipodomys* spp.)) also influenced vegetation productivity and dynamics.

Accounts of earlier explorers and settlers suggest the Rio Grande Plains was likely a mosaic of grasslands, savannahs, shrublands, and woodlands. Historical photographs suggest the nature of the vegetation structure likely varied from place-to-place depending on topography, soil properties and time since the last major disturbances (such as drought or fire). However, the occurrence of extensive

grasslands and grassland fauna (antelope, for example) is mentioned in numerous historical accounts. Plants likely at the time of European settlement included little bluestem (*Schizachyrium scoparium*), false Rhodes grass (*Chloris crinata*), and multiflower false Rhodes grass (*Chloris pluriflora*), Arizona cottontop (*Digitaria californica*), plains bristlegrass (*Setaria vulpisetia*), and pink pappusgrass (*Pappophorum bicolor*). The composition and productivity of grass communities would have varied with annual rainfall, soil depth and the extent of argillic horizon development. Many sites are now dominated by mesquite (*Prosopis glandulosa*), various acacias (*Acacia* spp.), granjeno (*Celtis pallida*), condalia (*Condalia obovata*), lime prickly ash, and prickly pear (*Opuntia* spp.). These woody plants are not new arrivals, but are native to the region and have increased in size and abundance within their historic ranges.

Grazing and fire are two factors that critically influence the relative abundance of grasses and woody plants through time. By the early 1800's cattle and sheep numbers appear to have been quite high in the Rio Grande Plains, resulting in heavy, year-round grazing. The resulting reduction in abundance of late seral grasses lead to a decline in soil organic matter, a reduction in fire frequency/intensity (due to lack of fine fuels), and a shift from midgrass domination to shortgrass, like hooded windmill grass (*Chloris cucullata*), three-awns (*Aristida* spp.) and forbs, like orange zexmenia (*Wedelia hispida*), and croton (*Croton* spp.). These changes would have favored woody plants, most of which are unpalatable to livestock, and enabled them to establish and attain dominance. This would be especially true for leguminous shrubs such as mesquite, whose seeds are widely spread by livestock.

The shift from grass to woody plant domination became the impetus for brush management practices. By the 1950's, large-scale mechanized clearing was common and by the 1970's, aerial herbicide applications were widespread. However, by the 1980's it was clear that brush management practices were often treating symptoms rather than underlying problems and having undesirable environmental consequences, including adverse effects on wildlife populations. Sites cleared of brush regenerated rapidly and often formed thickets that were denser and of lower diversity than the original stands. This realization, coupled with the fact that brush management treatments were typically short-lived, lead to the development of Integrated Brush Management Systems (IBMS). The IBMS approach takes a holistic, large-scale, long-term, whole-farm, ecosystem-based approach to brush management and recognizes multiple-use options for rangeland resources. Shrublands developing on former grasslands have other potential socioeconomic values that should be considered when contemplating brush management. These include alternate classes of livestock, lease hunting, deer and exotic game ranching, and ecotourism.

While shrublands have traditionally been viewed as degraded from a livestock production standpoint, it is important to recognize that they are not necessarily degraded from the ecological perspectives of primary productivity, nutrient cycling and biodiversity. The productivity of shrublands may be comparable to the grassland they replaced. In addition, shrubs modify soils and microclimate to increase levels of organic matter and nutrients in the upper four inches of the soil profile. This nutrient enrichment by shrubs can offset grazing-induced losses of soil nutrients and contribute to enhance grass production when shrub cover is reduced by natural or management-induced means. While the development of shrub communities may have adverse impacts on grasses and grassland fauna, other plants and animals may benefit. Thus, while ecosystem biodiversity certainly changes, it does not necessarily decrease with a shift from grass to woody plant domination.

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 (%)
Grass/Grasslike					
1	Perennial Tall/Midgrasses			1905-2774	
	little bluestem	SCSC	Schizachyrium scoparium	1905-2774	–
	Indiangrass	SONU2	Sorghastrum nutans	1905-2774	–
	multiflower false Rhodes grass	TRPL3	Trichloris pluriflora	1905-2774	–
2	Perennial Midgrasses			639-925	
	Indiangrass	SONU2	Sorghastrum nutans	1905-2774	–
	little bluestem	SCSC	Schizachyrium scoparium	1905-2774	–
	alkali sacaton	SPAI	Sporobolus airoides	0-925	–
	sideoats grama	BOCU	Bouteloua curtipendula	639-925	–
	silver beardgrass	BOLA2	Bothriochloa laguroides	639-925	–
	Arizona cottontop	DICA8	Digitaria californica	639-925	–
	Texas cupgrass	ERSE5	Eriochloa sericea	426-616	–
	streambed bristlegrass	SELE6	Setaria leucopila	426-616	–

	vine mesquite	PAOB	<i>Panicum obtusum</i>	426-616	–
	white tridens	TRAL2	<i>Tridens albescens</i>	213-308	–
	false Rhodes grass	TRCR9	<i>Trichloris crinita</i>	213-308	–
	pink pappusgrass	PABI2	<i>Pappophorum bicolor</i>	213-308	–
3	Perennial Shortgrasses			426-616	
	buffalograss	BODA2	<i>Bouteloua dactyloides</i>	426-616	–
	curly-mesquite	HIBE	<i>Hilaria belangeri</i>	426-616	–
4	Cool Season Grasses			426-616	
	Texas wintergrass	NALE3	<i>Nassella leucotricha</i>	426-616	–
	Scribner's rosette grass	DIOLS	<i>Dichanthelium oligosanthes var. scribnerianum</i>	213-308	–
	Virginia wildrye	ELVI3	<i>Elymus virginicus</i>	213-308	–
Forb					
5	Forbs			213-308	
	Forb, annual	2FA	<i>Forb, annual</i>	213-308	–
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	213-308	–
	Illinois bundleflower	DEIL	<i>Desmanthus illinoensis</i>	213-308	–
	snow on the prairie	EUBI2	<i>Euphorbia bicolor</i>	213-308	–
	Maximilian sunflower	HEMA2	<i>Helianthus maximiliani</i>	213-308	–
	coastal indigo	INMI	<i>Indigofera miniata</i>	213-308	–
	dotted blazing star	LIPU	<i>Liatris punctata</i>	213-308	–
	yellow puff	NELU2	<i>Neptunia lutea</i>	213-308	–
	fogfruit	PHYLA	<i>Phyla</i>	213-308	–
	upright prairie coneflower	RACO3	<i>Ratibida columnifera</i>	213-308	–
	American snoutbean	RHAM	<i>Rhynchosia americana</i>	213-308	–
	bushsunflower	SIMSI	<i>Simsia</i>	213-308	–
	silverleaf nightshade	SOEL	<i>Solanum elaeagnifolium</i>	213-308	–
Tree					
6	Trees/Shrubs			0-84	
	sweet acacia	ACFA	<i>Acacia farnesiana</i>	0-62	–
	spiny hackberry	CEEH	<i>Celtis ehrenbergiana</i>	0-62	–
	hackberry	CELT1	<i>Celtis</i>	0-62	–
	honey mesquite	PRGLG	<i>Prosopis glandulosa var. glandulosa</i>	0-62	–
	live oak	QUVI	<i>Quercus virginiana</i>	0-62	–

Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 3.2 plant community composition

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

As a historic tall/midgrass prairie, this site was occupied by bison, antelope, deer, quail, turkey, and dove. This site was also used by many species of grassland songbirds, migratory waterfowl, and coyotes. This site now provides forage for livestock and is still used by quail, dove, migratory waterfowl, grassland birds, coyotes, and deer. Feral hogs (*Sus scrofa*) can be found on most ecological sites in Texas. Damage caused by feral hogs each year includes, crop damage by rutting up crops, destroyed fences, livestock watering areas, and predation on native wildlife, and ground-nesting birds. Feral hogs have few natural predators, thus allowing their population to grow to high numbers. Wildlife habitat is a complex of many different plant communities and ecological sites across the landscape. Most animals use the landscape differently to find food, shelter, protection, and mates. Working on a conservation plan for the whole property, with a local professional, will help managers make the decisions that allow them to realize their goals for wildlife and livestock. Grassland State (1): This state provides the maximum amount of forage for livestock such as cattle. It is also utilized by deer, quail and other birds as a source of food. When a site is in the reference plant community phase (1.1) it will also be used by some birds for nesting, if other habitat requirements like thermal and escape cover are near. Tree/Shrubland (2): This state can be maintained to meet the habitat requirements of cattle and wildlife. Land managers can find a balance that meets their goals and allows them flexibility to manage for livestock and wildlife. Forbs for deer and birds like quail will be more plentiful in this state. There will also be more trees and shrubs to provide thermal and escape cover for birds as well as cover for deer. Converted Land State (3): The quality of wildlife habitat this site will produce is extremely variable and is influenced greatly by the timing of rain events. This state is often manipulated to meet landowner goals. If livestock production is the main goal, it can be converted to pastureland. It can also be planted to a mix of grasses and forbs that will benefit both livestock and wildlife. A mix of forbs in the pasture could attract pollinators, birds and other types of wildlife. Food plots can also be planted to provide extra nutrition for deer. This rating system provides general guidance as to animal preference for plant species. It also indicates possible competition between kinds of herbivores for various plants. Grazing preference changes from time to time, especially between seasons, and between animal kinds and classes. Grazing preference does not necessarily reflect the ecological status of the plant within the plant community. For wildlife, plant preferences for food and plant suitability for cover are rated. Refer to habitat guides for a more complete description of a species habitat needs.

Hydrological functions

Peak rainfall periods occur in May and June from thunderstorms and in September and October from tropical systems. Rainfall events may be high (3 to 5 inches per event) and intense. Extended periods (45 to 60 days) of little to no rainfall during the growing season are common. Because of the flat topography of this site, erosion is minimal, however on more sloping aspects (greater than three percent), erosion may be very significant. This site provides little water for aquifer recharge because when wet, infiltration is very slow.

Recreational uses

Hunting and photography are common activities.

Wood products

In the Grassland State, no wood products are available. In a Shrubland State, the site may produce many large mesquite trees and these are often cut for firewood and barbecue.

Inventory data references

The data contained in this document is derived from analysis of inventories, clipping studies, and ecological interpretation from field evaluations.

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Approval

Bryan Christensen, 9/19/2023

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.

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Date	08/08/2011
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. Number and extent of rills: None.

2. Presence of water flow patterns: Few water flow patterns are normal for this site due to landscape position and slopes.

3. Number and height of erosional pedestals or terracettes: Pedestals would have been uncommon for this site.

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

5. Number of gullies and erosion associated with gullies: None.

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

7. Amount of litter movement (describe size and distance expected to travel): Small-to-medium sized litter may move short distances during 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. Soil stability class range is expected to be 4 to 6.

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): Soil surface struture is 10 to 60 inches thick with colors ranging from black to dark grayish brown with subangular blocky structure. Soil organic matter is one to six percent.

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: A high canopy cover of bunch, rhizomatous, and stoliniferous grasses will help minimize runoff and maximize infiltration. Grasses and forbs should comprise approximately 90 percent of total plant composton by weight. Trees and shrubs will comprise about 10 percent by weight.

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

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: Perennial Tall/Midgrasses >> Perennial Midgrasses >>

Sub-dominant: Perennial Shortgrasses> Forbs > Cool Season grasses>> Trees/Shrubs

Other:

Additional:

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

14. Average percent litter cover (%) and depth (in):

15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):
4,000 to 5,500 pounds per acre.

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: Mesquite, huisache, willow baccharis, and Old World bluestems.

17. Perennial plant reproductive capability: All species should be capable of reproducing.
