Ecological site R083CY019TX
Gray Sandy Loam

Last updated: 9/19/2023
Accessed: 09/23/2026

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 Gray Sandy Loam refers to the gray-colored, sandy loam surfaces found on the ecological site. High amounts of calcium carbonates in the upper soil profile are responsible for the gray colors and alkalinity.

Associated sites

R083CY012TX	**Ramadero**
R083CY013TX	**Loamy Bottomland**
R083CY017TX	**Blackland**
R083CY022TX	**Loamy Sand**
R083CY024TX	**Tight Sandy Loam**
R083CY025TX	**Clay Loam**

R083CY002TX	**Shallow Ridge**
R083CY004TX	**Shallow Sandy Loam**
R083CY023TX	**Sandy Loam**

Similar sites

R083AY019TX	**Gray Sandy Loam**
R083BY019TX	**Gray Sandy Loam**
R083DY019TX	**Gray Sandy Loam**

Table 1. Dominant plant species

Tree	(1) *Prosopis glandulosa var. glandulosa*
Shrub	(1) *Acacia rigidula* (2) *Leucophyllum frutescens*
Herbaceous	(1) *Heteropogon contortus* (2) *Setaria vulpiseta*

Physiographic features

The sites are on nearly level to moderately sloping areas on ridges, paleoterraces, and interfluves on inland, dissected coastal plains. Runoff is low on one to five percent slopes and medium on five to eight percent slopes. No ponding or flooding is expected for this site. Elevation ranges from 20 to 800 feet.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Paleoterrace (2) Coastal plain > Ridge (3) Coastal plain > Interfluve
Runoff class	Negligible to low
Flooding frequency	None

Ponding frequency	None
Elevation	10 – 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) CHOKE CANYON DAM [USC00411720], Three Rivers, TX
- (2) MCCOOK [USC00415721], Edinburg, TX
- (3) FREER [USC00413341], Freer, TX
- (4) CALLIHAM [USC00411337], Calliham, TX
- (5) HEBBRONVILLE [USC00414058], Hebbronville, TX

Influencing water features

Water features do not influence this site.

Wetland description

N/A

Soil features

The soils are deep to very deep, well drained soils formed in calcareous loamy alluvium. These soils will be slightly too violently effervescent throughout the soil profile. Soil series correlated to this site include: Aguilares, Annarose, Benavides, Choke, Copita, Hidalgo, Houla, Lomart, Pernitas, Pharr, Salco, Sarnosa, and Turcotte.

Table 4. Representative soil features

Parent material	(1) Alluvium – calcareous sandstone (2) Residuum – calcareous sandstone
Surface texture	(1) Fine sandy loam (2) Sandy clay loam (3) Loam
Family particle size	(1) Fine-loamy (2) Coarse-loamy
Drainage class	Well drained
Permeability class	Moderate to moderately rapid
Soil depth	50 – 200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	10.16 – 17.78 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 40 %

Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 8.4
Subsurface fragment volume <=3" (15-202.9cm)	0 – 10 %
Subsurface fragment volume >3" (15-202.9cm)	Not specified

Ecological dynamics

The plant communities of this site are dynamic and vary in relation to grazing and drought. The reference plant community is open grassland with scattered mottes of woody shrubs. The dominant grasses include plains bristlegrass (Setaria vulpiseta), tanglehead (Heteropogon contortus), silver bluestem (Bothriochloa laguroides), hooded windmillgrass (Chloris cucullata), pink pappusgrass (Pappophorum bicolor), and false rhodesgrass (Trichloris crinata). The mixed brush is diverse and contains many different species including scattered brasil (Condalia hookeri), blackbrush acacia (Acacia rigidula), cenizo (Leucophyllum frutescens), and elbowbush (Forestiera pubescens). Grasses make up about 90 percent of the composition by weight.

Plant composition and productivity are affected by soil variations such as the extent of the argillic horizon development and the amount of carbonates within the profile. Landscape position is another factor that will affect the plant community. Because this site can occur on the summits or sideslopes of hills, the water shedding positions will be less productive than sites that receive runoff water. Once established shrubs such as blackbrush, guajillo (Acacia berlandieri), and cenizo tend to dominate and invade sites causing dense shrub communities that quickly grow and out-compete other plants for light, water, and nutrients.

Climatic variation and topoedaphic heterogeneity interact to influence vegetation responses to disturbances such as fire and grazing. Plants evolved with grazing and fire. Prior to European settlement, fires would likely have been frequent, occurring every 5 to 10 years. These fires would have resulted from lightening during the hot, dry summer months or by native Americans. Fires promote grasses, while making it difficult for woody plants to achieve dominance. During the Pleistocene age, 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 (Antilocarpa 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, and kangaroo rats (Dipodomys spp.) also influenced vegetation productivity and dynamics.

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 (Bos spp.) and sheep numbers appear to have been quite high in the Rio Grande Plains, resulting in heavy, year-round grazing. The resulting reduction of late seral grasses lead to a decline in soil organic matter, a reduction in fire frequency/intensity (caused by a lack of fine fuels) and a shift from midgrass domination to shortgrasses. Common forb and shrub invaders include orange zexmenia (Wedelia texana) and shrubby blue sage (Salvia ballotiflora). These changes would have favored woody plants, most of which are unpalatable to livestock, and enabled them to establish and attain dominance. A few woody shrubs that would increase on this site, along with the climax species already listed, include lotebush (Ziziphus obtusifolia), mesquite (Prosopis glandulosa), condalia (Condalia spp.), granjeno (Celtis ehrenbergiana), and Texas kidneywood (Diospyros texana). The brush community on this site can be very diverse but it is not uncommon for a few species to dominate an area and drastically reduce both herbaceous and woody species diversity.

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. Some practices also had 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 large-scale, long-term, 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, white-tailed deer and exotic game ranching, and ecotourism.

While shrublands on Gray Sandy Loam sites 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. Nutrient enrichment by shrubs can offset grazing and contribute to enhanced 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. 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	**Tall/Midgrasses**			448-1121	
	tanglehead	HECO10	*Heteropogon contortus*	112-392	–
	false Rhodes grass	TRCR9	*Trichloris crinita*	112-392	–
	multiflower false Rhodes grass	TRPL3	*Trichloris pluriflora*	112-392	–
2	**Midgrasses**			841-1793	
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	224-448	–
	silver beardgrass	BOLA2	*Bothriochloa laguroides*	168-392	–
	pink pappusgrass	PABI2	*Pappophorum bicolor*	168-392	–
	Arizona cottontop	DICA8	*Digitaria californica*	140-224	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	140-224	–
	Texas bristlegrass	SETE6	*Setaria texana*	84-168	–
3	**Shortgrasses**			392-785	
	hooded windmill grass	CHCU2	*Chloris cucullata*	84-140	–
	fall witchgrass	DICO6	*Digitaria cognata*	34-112	–
	curly-mesquite	HIBE	*Hilaria belangeri*	34-112	–
	Texas wintergrass	NALE3	*Nassella leucotricha*	0-112	–
	vine mesquite	PAOB	*Panicum obtusum*	0-112	–
	lovegrass tridens	TRER	*Tridens eragrostoides*	34-112	–
	slim tridens	TRMU	*Tridens muticus*	34-112	–
	threeawn	ARIST	*Aristida*	34-112	–
	buffalograss	BODA2	*Bouteloua dactyloides*	34-112	–
Forb					
4	**Forbs**			112-224	
	Forb, annual	2FA	*Forb, annual*	6-28	–
	Forb, perennial	2FP	*Forb, perennial*	6-28	–
	Texas Indian mallow	ABFR3	*Abutilon fruticosum*	6-28	–

	prairie broomweed	AMDR	*Amphiachyris dracunculoides*	6-28	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	6-28	–
	Illinois bundleflower	DEIL	*Desmanthus illinoensis*	6-28	–
	slimleaf heliotrope	HETO	*Heliotropium torreyi*	6-28	–
	yellow puff	NELU2	*Neptunia lutea*	6-28	–
	bushsunflower	SIMSI	*Simsia*	6-28	–
	silverleaf nightshade	SOEL	*Solanum elaeagnifolium*	6-28	–
	woody crinklemat	TICAC	*Tiquilia canescens var. canescens*	6-28	–
Shrub/Vine					
5	**Shrubs**			112-202	
	blackbrush acacia	ACRI	*Acacia rigidula*	17-34	–
	guajillo	ACBE	*Acacia berlandieri*	17-34	–
	Texas barometer bush	LEFR3	*Leucophyllum frutescens*	17-34	–
	desert yaupon	SCCU4	*Schaefferia cuneifolia*	11-22	–
	lime pricklyash	ZAFA	*Zanthoxylum fagara*	11-22	–
	lotebush	ZIOB	*Ziziphus obtusifolia*	11-22	–
	Texas persimmon	DITE3	*Diospyros texana*	11-22	–
	Texas kidneywood	EYTE	*Eysenhardtia texana*	11-22	–
	stretchberry	FOPU2	*Forestiera pubescens*	11-22	–
	Texas lignum-vitae	GUAN	*Guaiacum angustifolium*	11-22	–
	catclaw acacia	ACGR	*Acacia greggii*	11-22	–
	spiny hackberry	CEEH	*Celtis ehrenbergiana*	11-22	–
	Brazilian bluewood	COHO	*Condalia hookeri*	11-22	–
	Texan hogplum	COTET	*Colubrina texensis var. texensis*	11-22	–
	Christmas cactus	CYLE8	*Cylindropuntia leptocaulis*	6-11	–
	Rio Grande beebrush	ALMA9	*Aloysia macrostachya*	6-11	–
Tree					
6	**Trees**			0-22	
	honey mesquite	PRGLG	*Prosopis glandulosa var. glandulosa*	11-34	–
	live oak	QUVI	*Quercus virginiana*	0-22	–

Table 6. Community 1.2 plant community composition

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

Table 7. Community 2.1 plant community composition

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

Table 8. Community 3.1 plant community composition

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

Table 9. Community 3.2 plant community composition

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

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. Seeded 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 (three to five 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 topography of this site, erosion may be significant, especially in the Tree/Shrubland Complex (2), where there is less herbaceous cover and more bare ground. This increase in bare ground will also negatively affect the amount of water that is amble to infiltrate into the soil during rain events. This site provides little water for aquifer recharge because when wet, infiltration is slow.

Recreational uses

Hunting, bird watching, and photography are common activities.

Wood products

In the prairie state, few wood products are available. In a wooded state, the site may grow large numbers of shrubs and trees which can be cut for firewood.

Other products

Landowners have the opportunity to explore the many facets of ecotourism, and the potential of the natural resources of their property, to create value from their land.

Inventory data references

Information presented was derived from the revised Range Site, literature, limited NRCS clipping data (417s), field observations, and personal contacts with range-trained personnel.

Other references

Archer, S. 1995. Herbivore mediation of grass-woody plant interactions. Tropical Grasslands, 29:218-235.

Archer, S. 1995. Tree-grass dynamics in a Prosopis-thornscrub savanna parkland: reconstructing the past and predicting the future. Ecoscience, 2:83-99.

Archer, S. 1994. Woody plant encroachment into southwestern grasslands and savannas: rates, patterns and proximate causes. Ecological implications of livestock herbivory in the West, 13-68.

Archer, S., C. Scifres, C. R. Bassham, and R. Maggio. 1988. Autogenic succession in a subtropical savanna: conversion of grassland to thorn woodland. Ecological Monographs 58(2):110-127.

Archer, S. 1990. Development and stability of grass/woody mosaics in a subtropical savanna parkland, Texas, USA. Journal of Biogeography 17: 453-462.

Bond, W. J. What Limits Trees in C4 Grasslands and Savannas? Annual Review of Ecology, Evolution, and Systematics. 39:641-659.

De Leon, A. 2003. Itineraries of the De Léon Expeditions of 1689 and 1690. In Spanish Exploration in the Southwest, 1542-1706. Edited by H. E. Bolton. Charles Scribner's Sons, New York, NY.

Dillehay T. 1974. Late quaternary bison population changes on the Southern Plains. Plains Anthropologist, 19:180-96.

Duaine, C. L. 1971. Caverns of Oblivion. Packrat Press, Oak Harbor, WA.

Everitt, J. H., D. L. Drawe, and R. I. Leonard. 2002. Trees, Shrubs, and Cacti of South Texas. Texas Tech University Press, Lubbock, TX.

Everitt, J. H., D. L. Drawe, and R. I. Lonard. 1999. Field Guide to the Broad-Leaved Herbaceous Plants of South Texas. Texas Tech University Press. Lubbock, TX.

Ford, J. S. 2010. Rip Ford's Texas. University of Texas Press. Austin, TX.

Fulbright, T. E. and S. L. Beasom. 1987. Long-term effects of mechanical treatment on white-tailed deer browse. Wildlife Society Bulletin, 15:560-564.

Fulbright, T. E. and F. C. Bryant. 2003. The Wild Horse Desert: climate and ecology. The Ranch Management, 35-58.

Gilbert, L. E. 1982. An ecosystem perspective on the role of woody vegetation, especially mesquite, in the Tamaulipan biotic region of South Texas. Proceeding Symposium of the Tamaulipan Biotic Province, Corpus Christi, TX.

Hanselka, C. W., D. L. Drawe, and D. C. Ruthven, III. 2004. Management of South Texas Shrublands with prescribed fire. In Proceedings: Shrubland dynamics -- fire and water, 57-61.

Heitschmidt R. K., Stuth J. W., eds. 1991. Grazing management: an ecological perspective. Timberline Press, Portland, OR.

Inglis, J. M. 1964. A history of vegetation of the Rio Grande Plains. Texas Parks and Wildlife Department Bulletin No. 45, Austin, TX.

Jurena, P.N., and S. Archer. 2003. Woody Plant Establishment and Spatial Heterogeneity in Grasslands Ecology, 84(4):907-919.

Le Houerou, H. N. and J. Norwine. 1988. The ecoclimatology of South Texas. In Arid lands: today and tomorrow. Edited by E. E. Whitehead, C. F. Hutchinson, B. N. Timmesman, and R. G. Varady, 417-444. Westview Press, Boulder, CO.

Lehman, V. W. 1969. Forgotten legions: sheep in the Rio Grande Plains of Texas. Texas Western Press, University of Texas at El Paso, El Paso, TX.

McGinty, A. and D. N. Ueckert. 2001. The Brush Busters success story. Rangelands Archives, 23(6):3-8.

McLendon T. 1991. Preliminary description of the vegetation of South Texas exclusive of coastal saline zones. Texas Journal of Science, 43: 13-32

Neilson, R. P. 1987. Biotic regionalization and climatic controls in western North America. Vegetatio, 70(3): 135-147.

Norwine, J. 1978. Twentieth-century semiarid climates and climatic fluctuations in Texas and northeastern Mexico. Journal of Arid Environments, 1:313-325.

Norwine, J. and R. Bingham. 1986. Frequency and severity of droughts in South Texas: 1900-1983, 1-17. In Livestock and wildlife management during drought. Edited by R. D. Brown. Caesar Kleberg Wildlife Research Institute, Kingsville, TX.

Parvin, R. W. 2003. Rio Bravo Resource Conservation and Development. Llanos Mestenos South Texas Heritage Trail. Zapata, TX.

Rappole, J. H. and G. W. Blacklock. 1994. A field guide: Birds of Texas. Texas A&M University Press, College Station, TX.

Schmidley, D. J. 1983. Texas mammals east of the Balcones Fault zone. Texas A&M University Press. College Station, TX.

Scifres, C. J. and W. T. Hamilton. 1993. Prescribed burning for brushland management: the South Texas example. Texas A&M Press, College Station, TX.

Scifres C. J., W. T. Hamilton, J. R. Conner, J. M. Inglis, and G. A. Rasmussen. 1985. Integrated Brush Management Systems for South Texas: Development and Implementation. Texas Agricultural Experiment Station, College Station, TX.

Scifres, C. J., J.W. McAtee, and D. L. Drawe. 1980. Botanical, Edaphic, and Water Relationships of Gulf Cordgrass (Spartina spartinae [Trin.] Hitchc.) and Associated Communities The Southwestern Naturalist 25(3):397-409.

Texas Parks and Wildlife Department. 2007. List of White-tailed Deer Browse and Ratings. District 8.

Vavra, M., W. A. Laycock, R. D. Pieper. 1994. Ecological Implications of livestock herbivory in the West. Society for Range Management. Denver, CO.

Weltz, M. A. and W. H. Blackburn. 1995. Water budget for south Texas rangelands. Journal of Range Management, 48:45-52.

Whittaker, R. H., L. E. Gilbert, and J. H. Connell. 1979. Analysis of a two-phase pattern in a mesquite grassland, Texas. Journal of Ecology, 67:935-52.

Wright, B. D., R. K. Lyons, J. C. Cathey, and S. Cooper. 2002. White-tailed deer browse preferences for South Texas and the Edwards Plateau. Texas Cooperative Extension Bulletin B-6130.

Contributors

Gary Harris, MSSL, NRCS, Robstown, Texas

Approval

Bryan Christensen, 9/19/2023

Acknowledgments

Technical reviewers and contributors include: Clark Harshbarger, RSS, NRCS, Robstown Vivian Garcia, RMS, NRCS, Corpus Christi Shanna Dunn, RSS, NRCS, Corpus Christi Jason Hohlt, RMS, NRCS, Kingsville Tyson Hart, RMS, NRCS, Nacogdoches Michael Margo, RMS, NRCS, Marfa

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)	David Hinojosa, RMS, NRCS, Robstown, Texas Jason Hohlt, RMS, NRCS, Kingsville, Texas
Contact for lead author	361-241-0609
Date	09/17/2012
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 pattens 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 6 to 12 inches thick with colors ranging from very dark gray to pale brown with subangular blocky structure. SOM is less than three 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 should comprise approximately 90 percent of total annual production by weight. Shrubs will comprise about five 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 Midgrasses > Perennial Tall/Midgrasses >>

Sub-dominant: Perennial Shortgrasses > Forbs > Shrubs > Trees

Other:

Additional:

---

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** **Potential for 5 to 15 percent plant mortality of perennial bunchgrasses during extreme drought**

---

14. **Average percent litter cover (%) and depth (in):** **5 to 15 percent litter cover.**

---

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** **1,700 to 4,200 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:** **Cenizo, blackbrush, guajillo, mesquite, Old World bluestems, and buffelgrass.**

---

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