Ecological site R083BY009TX
Clayey Bottomland

Last updated: 9/19/2023
Accessed: 08/28/2026

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): 083B–Western Rio Grande Plain

Major Land Resource Area (MLRA) 83B It makes up about 9,285 square miles (24,060 square kilometers). The border towns of Del Rio, Eagle Pass, Laredo, and Zapata are in this MLRA. Interstate 35 crosses the area just north of Laredo. The Amistad National Recreation Area is just outside this MLRA, northwest of Del Rio, and the Falcon State Recreation Area is southeast of Laredo. Laughlin Air Force Base is just east of Del Rio. This area is comprised of inland, dissected coastal plains.

Classification relationships

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

Ecological site concept

The Clayey Bottomland site is deep to very deep with clay surface textures occurring on flood plains. The soils are slightly alkaline and slightly saline.

Associated sites

R083BY012TX	Ramadero
R083BY016TX	Saline Clay Loam

Similar sites

R083AY009TX	Clayey Bottomland
R083DY009TX	Clayey Bottomland

Table 1. Dominant plant species

Tree	(1) *Quercus virginiana* (2) *Prosopis glandulosa*

Shrub	(1) *Opuntia*
Herbaceous	(1) *Trichloris pluriflora*

Physiographic features

This site occurs on low terraces of old flood plains. The setting is slightly depressed to nearly level areas that receive overflow about twice in every five years. Slopes are generally less than one percent. Elevation ranges from 165 to 1,200 feet. This area is comprised of inland, dissected coastal plains.

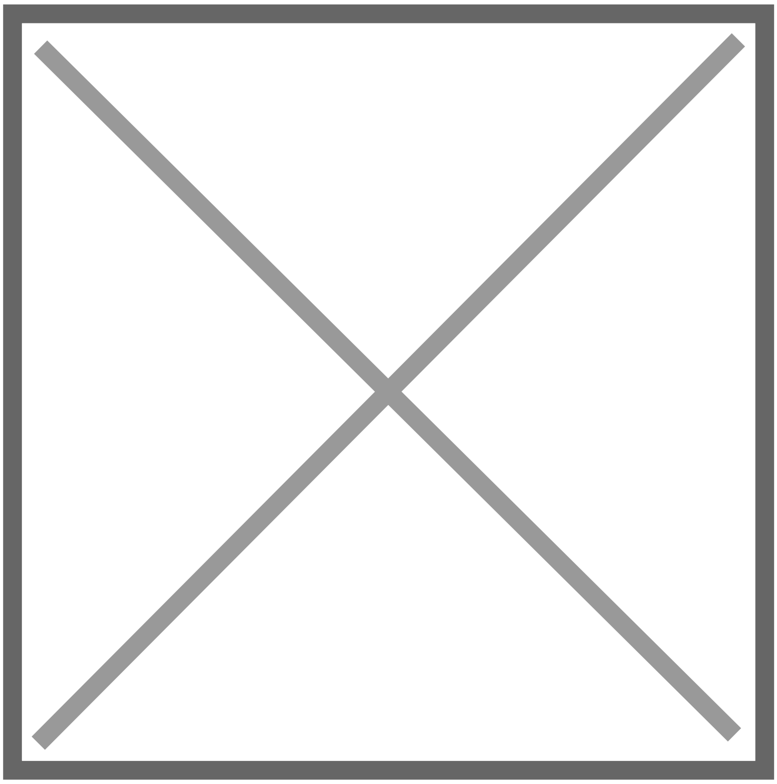

Figure 1.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Flood plain
Runoff class	Medium to very high
Flooding duration	Very brief (4 to 48 hours) to very long (more than 30 days)
Flooding frequency	None to frequent
Elevation	40 – 370 m
Slope	0 %

Water table depth	90 – 200 cm
Aspect	Aspect is not a significant factor

Climatic features

MLRA 83B mainly has a subtropical steppe climate along the Rio Grande River and subtropical subhumid climates in La Salle and McMullen counties. Winters are dry and mild and the summers are hot. 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 occurs late in spring and a secondary peak occurs early in fall. Most heavy thunderstorm activities occur during the summer months. 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 as the storms dissipate. 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)	230-320 days
Freeze-free period (characteristic range)	310-370 days
Precipitation total (characteristic range)	510 mm
Frost-free period (actual range)	210-370 days
Freeze-free period (actual range)	260-370 days
Precipitation total (actual range)	480-530 mm
Frost-free period (average)	270 days
Freeze-free period (average)	340 days
Precipitation total (average)	510 mm

- (1) EAGLE PASS 3N [USC00412679], Eagle Pass, TX
- (2) ZAPATA 1 S [USC00419976], Zapata, TX
- (3) CRYSTAL CITY [USC00412160], Crystal City, TX
- (4) LAREDO 2 [USC00415060], Laredo, TX
- (5) DEL RIO INTL AP [USW00022010], Del Rio, TX
- (6) CATARINA [USC00411528], Asherton, TX
- (7) DEL RIO 2 NW [USC00412361], Del Rio, TX
- (8) FALCON DAM [USC00413060], Roma, TX

Influencing water features

The Clayey Bottomlands occur on flood plains with overflow water. Flooding will occur occasionally to frequently lasting very brief to long durations.

Wetland description

Wetlands may occur near this site but typically this site is not a hydric soil and is not a wetland. If a wetland is suspected an onsite investigation is needed.

Soil features

The soils are very deep, moderately well to somewhat poorly drained with very slow permeability. The salinity ranges from non-saline to very slightly saline within the top 20 inches. Sodicity also increases with depth. Soil reaction is slightly alkaline or moderately alkaline. Surface color is grayish brown. Soil series correlated to this site include: Arroyada, Cochina, and Coquat.

Table 4. Representative soil features

Parent material	(1) Alluvium – claystone
Surface texture	(1) Clay
Family particle size	(1) Fine (2) Very-fine
Drainage class	Somewhat poorly drained to 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)	7.62 – 12.7 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 30 %
Electrical conductivity (0-101.6cm)	0 – 30 mmhos/cm

Sodium adsorption ratio (0-101.6cm)	0 – 50
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	Not specified
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

The accounts of early explorers and settlers suggest that the Rio Grande Plains was likely a vast mosaic of open grassland, savannah, and shrubland. While moving in 1691 out of Maverick County and into Zavala County, Don Domingo de Teran found after crossing the Nueces River “the country was level and covered with mesquites and cats’ claw.” In 1849, Michler described south Texas as “concerning the land both on the Frio and the Leona, from these rivers back, that it may be divided into four parallel strips-the first, next to the river, consisting of heavy timber, and a heavy black soil, the second, a mesquite flat, of small width, and the soil of a lighter nature, and very fertile; the third, a range of low hills, covered with loose stones, and thick chaparral; the fourth, a wide-open prairie.” Lehman indicates, “thus while it is quite true that the Rio Grande Plains once had fewer woody plants and more grass than now, it is also true that an ample seed stock of shrubs and trees has been widely distributed for as long as man has known.” The vegetation structure likely varied from place-to-place depending on topography, soil properties, and time since the last major disturbance.

Large numbers of domestic livestock grazed South Texas as early as the mid-1700’s. Formal deeds to properties from the Spanish and Mexican governments came in the late 1760’s with much larger blocks granted in the decades to follow. Lehman indicated, “in 1757, the official Spanish census showed residents of Camargo and Reynosa in the lower Rio Grande owning over 90,000 sheep and goats. By way of contrast, combined numbers of cattle, oxen, horses, mules and burros were less than 16,000.” By the mid-1800’s, according to Lehman’s figures from the U. S. Census of 1889, “there were a minimum of 1,644,268 sheep-fully 45 percent of Texas total population, grazing south of the Nueces River.” According to Inglis, “the Rio Grande Plains had the four-leading sheep producing counties in the state and ten of the top fifteen sheep producing counties were in South Texas. The peak decade was 1880 to 1890, at times exceeding two million head.” These domestic animals were in addition to bison, antelope, deer, and large herds of wild horses. It is obvious from early accounts, that much of the Rio Grande Plains was periodically grazed hard by both domestic animals and wild populations as early as the early to mid-1700’s. It may be that overgrazing by sheep and goats could have suppressed the many shrubs, reduced shrub canopy, and arrested shrub seedlings.

With the arrival of European man, the South Texas area was fenced and, in many instances, stocked beyond its capability to sustain forage. This overstocking led to a reduced fire frequency and intensity, creating an opportunity for woody shrubs to increase across the landscape. As the natural graze-rest cycles were altered and stocking rates continued to exceed the natural carrying capacity of the land, midgrasses were replaced by shortgrasses and the ground cover was opened so additional annual and perennial forbs also increased. Drought certainly enhanced this effect. As prolonged overgrazing continued, shrub cover increased. Shortgrasses became dominant and forage production decreased. This change in plant cover and structure further decreased fire frequency and intensity, favoring shrub establishment and dominance.

The plant communities of this site are dynamic varying in relation to fire, periodic drought, and wet cycles. Periodic fires were set by either Native Americans or started naturally by lightning. Fire did not play as important a role on this site as in deeper more productive sites due to lower production of grasses to burn. Because of large amounts of gravel in the soil, available water holding capacity is greatly reduced. This causes highly variable forage production and minimal grass production during dry years. The historic community of this site was influenced to some extent by periodic grazing by herds of buffalo and wild horses. Herds of buffalo and wild horses would come into an area, graze it down, and then not come back for many months or even years depending upon the availability of water. This long deferment period allowed recovery of the grasses and forbs which served as fuel load. More than likely, fire occurred following years of good rainfall followed by a dry season. The fire frequency for this area is interpreted to be four to six years (Frost, 1998).

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	**Warm season bunchgrasses**			3138-5828	
	big sacaton	SPWR2	*Sporobolus wrightii*	0-5828	–
	switchgrass	PAVI2	*Panicum virgatum*	0-5604	–
	big sandbur	CEMY	*Cenchrus myosuroides*	0-5044	–
	southwestern bristlegrass	SESC2	*Setaria scheelei*	0-5044	–
	multiflower false Rhodes grass	TRPL3	*Trichloris pluriflora*	448-2690	–
	large-spike bristlegrass	SEMA5	*Setaria macrostachya*	0-1121	–
2	**Warm season mid/shortgrasses**			224-2018	
	pink pappusgrass	PABI2	*Pappophorum bicolor*	0-1121	–
	buffalograss	BODA2	*Bouteloua dactyloides*	0-897	–
	curly-mesquite	HIBE	*Hilaria belangeri*	0-897	–
	white tridens	TRAL2	*Tridens albescens*	0-336	–
	Madagascar dropseed	SPPY2	*Sporobolus pyramidatus*	0-224	–
3	**cool season bunch grasses**			224-2018	
	Texas wintergrass	NALE3	*Nassella leucotricha*	0-1121	–
	sedge	CAREX	*Carex*	0-336	–
Forb					
4	**Forbs**			56-280	
	bluestem pricklypoppy	ARAL3	*Argemone albiflora*	0-56	–
	spiny chloracantha	CHSP11	*Chloracantha spinosa*	0-56	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0-56	–
	bundleflower	DESMA	*Desmanthus*	0-45	–
	plains dozedaisy	APRA	*Aphanostephus ramosissimus*	0-34	–
	littleleaf sensitive-briar	MIMI22	*Mimosa microphylla*	0-34	–
	wild petunia	RUELL	*Ruellia*	0-34	–
	annual bushsunflower	SILA11	*Simsia lagasceiformis*	0-34	–
	vervain	VERBE	*Verbena*	0-34	–
	globemallow	SPHAE	*Sphaeralcea*	0-22	–
	fanpetals	SIDA	*Sida*	0-22	–
	sand phacelia	PHPA4	*Phacelia patuliflora*	0-22	–
	groundcherry	PHYSA	*Physalis*	0-22	–
	pepperweed	LEAP6	*Lepidium apetalum*	0-22	–
Shrub/Vine					
5	**Shrub/Vines**			112-336	
	whitebrush	ALGR2	*Aloysia gratissima*	0-224	–
	Texas persimmon	DITE3	*Diospyros texana*	0-168	–
	lotebush	ZIOB	*Ziziphus obtusifolia*	0-112	–
	saltbush	ATRIP	*Atriplex*	0-56	–
	guajillo	ACBE	*Acacia berlandieri*	0-56	–
	blackbrush acacia	ACRI	*Acacia rigidula*	0-56	–
	stretchberry	FOPU2	*Forestiera pubescens*	0-56	–
	Texas lignum-vitae	GUAN	*Guaiacum angustifolium*	0-56	–

	Berlandier's wolfberry	LYBE	*Lycium berlandieri*	0-56	–
	pricklypear	OPUNT	*Opuntia*	11-56	–
	desert yaupon	SCCU4	*Schaefferia cuneifolia*	0-56	–
	lime pricklyash	ZAFA	*Zanthoxylum fagara*	0-56	–
Tree					
6	**Trees**			673-1121	
	live oak	QUVI	*Quercus virginiana*	224-673	–
	honey mesquite	PRGL2	*Prosopis glandulosa*	168-448	–
	cedar elm	ULCR	*Ulmus crassifolia*	168-448	–
	knockaway	EHAN	*Ehretia anacua*	0-336	–
	Mexican ash	FRBE	*Fraxinus berlandieriana*	0-336	–
	common buttonbush	CEOC2	*Cephalanthus occidentalis*	0-224	–
	gum bully	SILA20	*Sideroxylon lanuginosum*	0-224	–

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 2.2 plant community composition

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

Table 9. Community 3.1 plant community composition

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

Table 10. 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. 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

The water cycle on this site functions according to the management of not only the existing plant community but also of the surrounding plant communities. The water cycle is most functional when the site is dominated by tall bunchgrass and native trees as the site functions much the same as a sponge. Rapid rainfall infiltration, high soil organic matter, good soil structure, and good porosity are present with a good cover of bunchgrass. Quality of surface runoff will be high, while erosion and sedimentation rates will be low. With high rates of infiltration and periods of heavy rainfall, some water will move below the root zone of grasses. As this water moves downward it may contribute to the recharge of some aquifers. When unmanaged grazing causes loss or reduction of bunchgrass and ground cover, the water cycle becomes impaired. Infiltration is decreased and runoff is increased because of poor ground cover, rainfall splash, soil capping, low organic matter, and poor structure. With a combination of a sparse ground cover and intensive rainfall, this site can contribute to an increased frequency and severity of flooding within a watershed. Soil erosion is accelerated, quality of surface runoff is poor, and sedimentation is increased. As the site becomes dominated by woody species, especially oaks, mesquite, and shrubs, the water cycle is further altered. Interception of rainfall by tree canopies is increased which reduces the amount of rainfall reaching the surface (Thurow and Hester, 1997). Stem flow is increased, however, because of the funneling effect of the canopy by the oaks and mesquite. This increases soil moisture at the base of the tree. Increased transpiration, especially when evergreen species like live oak dominate and provide less chance for deep percolation into aquifers. As woody species increase, grass cover declines, which causes some of the same results as heavy grazing. Various brush management components can help restore the natural hydrology of the site. Also, critical to the overall health of the Clayey Bottomland is the existence of healthy streamside or riparian vegetation. These small but very important vegetative communities exist in the transition zone between the upland portion of the site and the creeks or streams. Many important functions come from a healthy riparian plant community. These communities protect the streambanks during flooding much the same as shingles protect a roof. They also trap sediments, deadfall, and nutrients fostering the building of soils and nutrients. Another function is that of a sponge, absorbing water and slowly releasing it over time leading to a more sustained flow. These small areas also provide diverse grazing for livestock. If a mature woodland canopy develops, a buildup of leaf litter occurs which increases the organic matter of the soil, builds structure, improves infiltration, and retards erosion. Some, but not all values of a properly functioning water cycle are restored on this site when a woodland plant community persists.

Recreational uses

Hunting and bird watching are common activities.

Wood products

Cutting hardwoods for firewood is the main wood product on this site.

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.

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.

Frost, C. C. 1998. Presettlement fire frequency regimes of the United States: a first approximation. In Fire in ecosystem management: shifting the paradigm from suppression to prescription. Tall Timbers Fire Ecology Conference Proceedings. 20:70-81.

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, W., R. Lyons, and M. Moseley. 2009. Grazing Land Stewardship: A Manual for Texas Landowners. Texas AgriLife Extension

Service, College Station, TX.

Hart, C. R., T. Garland, A. C. Barr, B. B. Carpenter, and J.C. Reagor. 2003. Toxic Plants of Texas: Integrated Management Strategies to Prevent Livestock Losses. Texas Cooperative Extension Bulletin B-6103 11-03.

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.

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., D. N. Ueckert. 2001. The Brush Busters success story. Rangelands, 23:3-8.

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

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.

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.

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

Thurow, T. L. and J. W. Hester. 1997. How an increase or reduction in juniper cover alters rangeland hydrology. Juniper Symposium Proceedings. Texas A&M University, San Angelo, TX.

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

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.

Approval

Bryan Christensen, 9/19/2023

Acknowledgments

Reviewers and Contributors: Vivian Garcia, RMS, NRCS, Corpus Christi, Texas Jason Hohlt, RMS, NRCS, Kingsville, Texas Forrest Smith, South Texas Natives, Kingsville, Texas Dusty Crowe, DC, NRCS, Carrizo Springs, Texas Gary Harris, MSSL, NRCS, Robstown, Texas Shanna Dunn, RSS, NRCS, Corpus Christi, Texas Ann Kinney, Editor, NRCS, Temple, Texas Mark Moseley, ESS, NRCS, San Antonio, Texas

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)	Vivian Garcia, RMS, NRCS, Corpus Christi, Texas

Contact for lead author	361-241-0609, Corpus Christi Zone Office
Date	04/02/2015
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:** **None.**
3. **Number and height of erosional pedestals or terracettes:** **None.**
4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** **Small and non-connected areas.**
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):** **Short, less than one foot except during overflow events.**
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** **Soil Stability Rating of 5 to 6.**
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** **Subangular blocky, A-horizon 4 to 12 inches, three percent SOM.**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** **Tall and midgrasses reduce runoff to minimal amounts except in exceptional rainfall events.**

---

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: Warm season tall grasses>>

    Sub-dominant: short warm season grasses (SD)> cool season grasses (SD)>perennial forbs(SD)> trees=shrubs (SD). Forbs make up 10 percent species composition, shrubs and trees compose up to 10 percent.

    Other:

    Additional:

---

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** **None.**

---

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):** **3,750 to 8,550 air-dry 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:** **King Ranch bluestem, spiny aster, mesquite, twisted acacia, annual forbs, annual panicums, threeawns, and red grama.**

---

17. **Perennial plant reproductive capability:** **All plants should reproduce each year.**
