Ecological site R150BY530TX
Northern Coastal Sand

Last updated: 9/22/2023
Accessed: 09/21/2026

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): 150B–Gulf Coast Saline Prairies

MLRA 150B is in the West Gulf Coastal Plain Section of the Coastal Plain Province of the Atlantic Plain and entirely in Texas. It makes up about 3,420 square miles. It is characterized by nearly level to gently sloping coastal lowland plains dissected by rivers and streams that flow toward the Gulf of Mexico. Barrier islands and coastal beaches are included. The lowest parts of the area are covered by high tides, and the rest are periodically covered by storm tides. Parts of the area have been worked by wind, and the sandy areas have gently undulating to irregular topography because of low mounds or dunes. Broad, shallow flood plains are along streams flowing into the bays. Elevation generally ranges from sea level to about 10 feet, but it is as much as 25 feet on some of the dunes. Local relief is mainly less than 3 feet. The towns of Groves, Texas City, Galveston, Lake Jackson, and Freeport are in the northern half of this area. The towns of South Padre Island, Loyola Beach, Corpus Christi, and Port Lavaca are in the southern half. Interstate 37 terminates in Corpus Christi, and Interstate 45 terminates in Galveston.

Classification relationships

USDA-Natural Resources Conservation Service, 2006. -Major Land Resource Area (MLRA) 150B

Ecological site concept

Northern Coastal Sands are sandy-textured ecological sites positioned in front and behind Coastal Dunes in areas of mean annual precipitation greater than 41inches. Northern Coastal Sands do not pond and have a water table below 40 inches.

Associated sites

R150BY713TX	**Coastal Swale** Also found on barrier flat but much lower with ponding water. Found below Low Coastal Sand.
R150BY552TX	**Tidal Flat** Located on a lower landform closer to the bay. Areas are subject to tidal flooding.
R150BY714TX	**Coastal Dune** Coastal Dunes are sandy-textured formations adjacent to the ocean or bay. The dunes are dynamic and actively move across the landscape, especially when they are devoid of vegetation.
R150BY550TX	**Northern Salt Marsh** This site is lower in the landscape and is wetter.

Similar sites

R150BY648TX	**Southern Coastal Sand** Similar landscape but different precipitation regime.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Baccharis*
Herbaceous	(1) *Schizachyrium scoparium* (2) *Uniola paniculata*

Physiographic features

The sites are found on beach ridges and strand plains of the Coastal Plain and in the foredunes and dune fields of the Barrier Islands. This nearly level to gently sloping site formed in sandy sediments that have been reworked by wind and wave action. A water table is present approximately 30 to 60 inches below the surface during normal years. Elevation ranges from 2 to 30 feet.

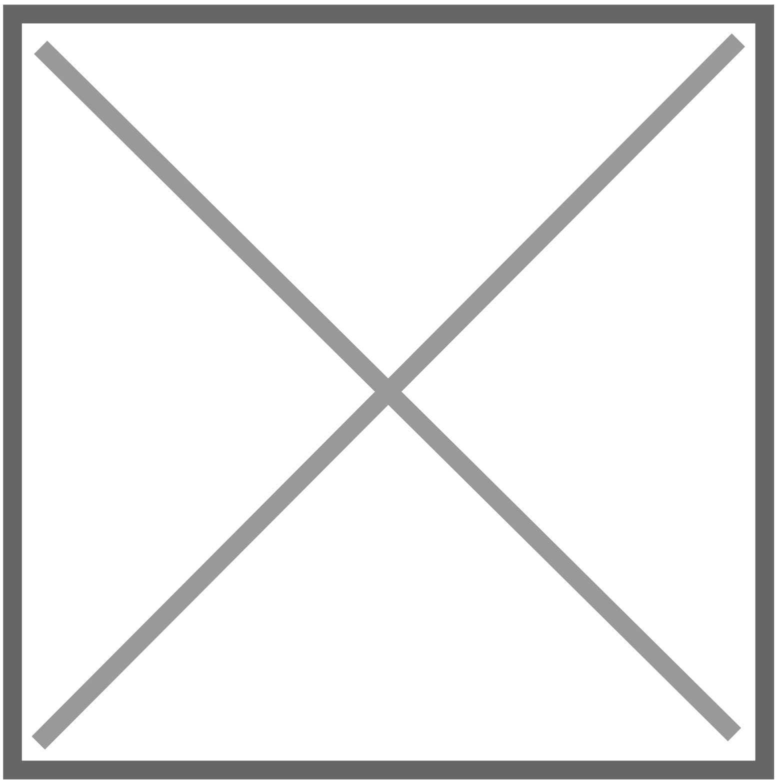

Figure 1.

Table 2. Representative physiographic features

Landforms	(1) Barrier island > Foredune (2) Barrier island > Beach ridge (3) Coastal plain > Strand plain

Runoff class	Negligible to very low
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	None to occasional
Ponding frequency	None
Elevation	0 – 10 m
Slope	0 – 10 %
Water table depth	90 – 150 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate is predominately maritime, controlled by the warm and very moist air masses from the Gulf of Mexico. The climate along the upper coast of the barrier islands is subtropical subhumid and the climate on the lower coast of Padre Island is subtropical semiarid (due to high evaporation rates that exceed precipitation). Almost constant sea breezes moderate the summer heat along the coast. Winters are generally warm and are occasionally interrupted by incursions of cool air from the north. Spring is mild and damaging wind and rain may occur during spring and summer months. Tropical cyclones or hurricanes can occur with wind speeds of greater than 74 mph and have the potential to cause flooding from torrential rainstorms. Despite the threat of tropical storms, the storms are rare. Throughout the year, the prevailing winds are from the southeast to south-southeast.

The average annual precipitation is 45 to 57 inches in the northeastern half of this area, 26 inches at the extreme southern tip of the area, and 30 to 45 inches in the rest of the area. Precipitation is abundant in spring and fall in the southwestern part of the area and is evenly distributed throughout the year in the northeastern part. Rainfall typically occurs as moderate-intensity, tropical storms that produce large amounts of rain during the winter. The average annual temperature is 68 to 74 degrees F. The freeze-free period averages 340 days and ranges from 315 to 365 days.

Table 3 Representative climatic features

Frost-free period (characteristic range)	250-370 days
Freeze-free period (characteristic range)	370 days
Precipitation total (characteristic range)	1,090-1,300 mm
Frost-free period (actual range)	240-370 days
Freeze-free period (actual range)	240-370 days
Precipitation total (actual range)	970-1,300 mm

Frost-free period (average)	310 days
Freeze-free period (average)	340 days
Precipitation total (average)	1,170 mm

- (1) PORT O'CONNOR [USC00417186], Port O Connor, TX
- (2) PALACIOS MUNI AP [USW00012935], Palacios, TX
- (3) FREEPORT 2 NW [USC00413340], Freeport, TX
- (4) GALVESTON SCHOLES FLD [USW00012923], Galveston, TX
- (5) GALVESTON [USW00012944], Galveston, TX
- (6) MATAGORDA NO 2 [USC00415659], Matagorda, TX
- (7) ANGLETON BRAZORIA AP [USW00012976], Angleton, TX

Influencing water features

In some areas, the water table will be near the surface for a very brief or brief period following storms or abnormally high tides. This site normally does not flood during daily tidal events but is rarely to occasionally inundated with salt water during cyclonic storms for very brief or brief durations. Permeability is very rapid above the water table.

Wetland description

Poorly drained sites have hydric soils. Better drained sites are non-hydric but may have small areas of hydric soils Onsite investigation needed to determine local conditions.

Soil features

The soils are of very deep, moderately well to somewhat excessively drained, with very rapid permeability. Surface textures include fine sand, loamy fine sand, and sand. Soils are commonly non-saline and non-sodic. Other soil features include no to little calcium carbonate percentage and moderately acid to moderately alkaline soil reactions. Soil correlated to this site include: Galveston.

Table 4. Representative soil features

Parent material	(1) Eolian sands – igneous, metamorphic and sedimentary rock (2) Fluviomarine deposits – igneous, metamorphic and sedimentary rock
Surface texture	(1) Fine sand (2) Loamy fine sand (3) Sand
Family particle size	(1) Sandy (2) Loamy
Drainage class	Moderately well drained to somewhat excessively drained

Permeability class	Rapid to very rapid
Soil depth	200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-152.4cm)	10.16 – 15.24 cm
Calcium carbonate equivalent (0-152.4cm)	Not specified
Electrical conductivity (0-152.4cm)	Not specified
Sodium adsorption ratio (0-152.4cm)	0 – 10
Soil reaction (1:1 water) (0-152.4cm)	5.6 – 8.4
Subsurface fragment volume <=3" (0-152.4cm)	Not specified
Subsurface fragment volume >3" (0-152.4cm)	Not specified

Ecological dynamics

The Texas coastline is composed of barrier islands, peninsulas, bays, estuaries, and natural or man-made passes. These mobile environments are constantly reshaped by the process of erosion and accretion. Hurricane activity can significantly change the island's environment. The Padre Island region is subdivided into habitats based on landform and vegetation. The Coastal Sand ecological lies on the bay side of the foredunes. The landforms vary from almost level to a series of low ridges and hummocky surfaces. The variety of vegetation is greater than other inland sites. The overall aspect is a grassland plain.

The plant communities are dynamic, and composition may vary dramatically with variations in annual rainfall, grazing, and fire. This landscape is typically a vegetated barrier flat unless impacted by recent hurricane activity. Because of southern proximity and nearness to the Gulf of Mexico, extreme climatic variations ranging from extended drought to hurricanes are possible. Bare ground may predominate during droughts or following hurricanes while a midgrass prairie may predominate under proper management and non-droughty periods.

This site has historically been an open prairie comprised of tall/midgrass plant community. The dominant grasses are seacoast bluestem (Schizachyrium littorale) and other important associated grasses include gulfdune paspalum (Paspalum monostachyum), and brownseed paspalum (Paspalum plicatulum), and seacoast dropseed (Sporobolus virginicus). Bare ground may dominate during droughts, following hurricanes, or other severe soil disturbance events.

Continued overuse by livestock results in a midgrass community. This community is the result from the decline of seacoast bluestem, seacoast dropseed, and other perennial grasses with an increase in brownseed paspalum, and hairawn muhly (Muhlenbergia capillaris). Lack of brush control and improper grazing management may result in a transition to the Shrubland State. Common shrub species include baccharis (Baccharis spp.), wax myrtle (Morella cerifera), greenbrier (Smilax spp.), dewberry (Rubus spp.), and prickly pear (Opuntia spp.). Nonnative invaders include Chinese tallow (Triadica sebifera) and saltcedar (Tamarix spp.).

Further overgrazing will cause seacoast bluestem to be virtually absent. Threeawns (Aristida spp.), broomsedge bluestem (Andropogon virginicus), yankeeweed (Eupatorium compositifolium), ragweed (Ambrosia spp.), croton (Croton spp.), wax myrtle, wild indigo (Baptisia spp.), and sesbania (Sesbania spp.). Nonnative invaders include Smutgrass (Sporobolus indicus), carpetgrass (Axonopus spp.). Severe overuse results in a large amount of bare ground and blowing sand. Blowing sand further accelerates community degradation.

The intensity of a hurricane plays a large role in the plant community. Due to the extensive creeping rhizomes and ability to tolerate high salinity levels, gulfdune paspalum can survive a moderately-intensive hurricane while other species cannot. Following a hurricane, the plant community will consist of gulfdune paspalum and various annual pioneer plants. Following a severe hurricane, vegetation will be virtually devoid. Length of recovery to reference conditions will depend on the severity and the ability to defer from grazing or other major natural disturbance.

Active sand dunes occur on this site. Overuse by livestock exacerbates dune formation. Continuous dunes sometimes cover several square miles. The dunes add to landscape diversity but can pose management problems because they migrate across the landscape and may cover fences, roads, equipment, and buildings. Cutting native hay near a sand dune and mulching the dune with the hay while lightly incorporating the hay into the soil is an effective method of stabilizing dunes.

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 tallgrasses**			1121-4573	
	shore little bluestem	SCLI11	*Schizachyrium littorale*	1121-4573	–
2	**Warm-season midgrasses**			673-1524	
	gulfdune paspalum	PAMO4	*Paspalum monostachyum*	560-1121	–
	saltmeadow cordgrass	SPPA	*Spartina patens*	448-897	–
	broomsedge bluestem	ANVI2	*Andropogon virginicus*	673-897	–
	bushy bluestem	ANGL2	*Andropogon glomeratus*	448-673	–
3	**Other grasses**			168-381	
	seaoats	UNPA	*Uniola paniculata*	0-224	–
	hairawn muhly	MUCA2	*Muhlenbergia capillaris*	84-112	–
	bitter panicgrass	PAAM2	*Panicum amarum*	84-112	–
	Wright's threeawn	ARPUW	*Aristida purpurea var. wrightii*	56-84	–
4	**Grasslikes**			168-381	
	sedge	CAREX	*Carex*	112-224	–
	rush	JUNCU	*Juncus*	112-224	–
Forb					
5	**Forbs**			168-448	
	bundleflower	DESMA	*Desmanthus*	84-140	–

	snoutbean	RHYNC2	*Rhynchosia*	84-140	–
	partridge pea	CHFA2	*Chamaecrista fasciculata*	84-140	–
	sensitive plant	MIMOS	*Mimosa*	84-140	–
	phlox	PHLOX	*Phlox*	56-112	–
	groundcherry	PHYSA	*Physalis*	56-112	–
	camphor daisy	RAPH2	*Rayjacksonia phyllocephala*	56-112	–
	croton	CROTO	*Croton*	56-112	–
	hydrocotyle	HYDRO2	*Hydrocotyle*	56-112	–
	ragweed	AMBRO	*Ambrosia*	56-112	–
	false indigo	AMORP	*Amorpha*	56-112	–
	wild indigo	BAPTI	*Baptisia*	56-112	–
	bushy seaside tansy	BOFR	*Borrichia frutescens*	28-84	–
	Forb, annual	2FA	*Forb, annual*	28-84	–
Shrub/Vine					
6	**Shrubs**			168-448	
	baccharis	BACCH	*Baccharis*	112-336	–
	wax myrtle	MOCE2	*Morella cerifera*	112-336	–
	pricklypear	OPUNT	*Opuntia*	112-336	–
	blackberry	RUBUS	*Rubus*	112-336	–
	greenbrier	SMILA2	*Smilax*	112-336	–

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 (%)

Animal community

The animal communities of the Coastal Prairie communities are influenced by fresh and salt water inundations. Cattle and many species of wildlife make extensive use of the site. White-tailed deer may be found scattered across the prairie and are found in heavier concentrations where woody cover exists. Feral hogs are present and at times become abundant. Coyotes are abundant and fill the mammalian predator niche. Rodent populations rise during drier periods and fall during periods of inundation. Alligators are locally abundant and make frequent use of the marshes depending on salt concentrations in the marshes. The region is a major flyway for waterfowl and migrating birds. Hundreds of thousands of ducks, geese, and sandhill cranes abound during winter. Whooping cranes are an important endangered species that occur in the area, especially near Aransas National Wildlife Refuge. Northern harriers are common predatory birds seen patrolling marshes. Curlews, plovers, sandpipers, and willets are shorebirds that make use of the tidal areas. Seagulls and terns are plentiful throughout the year trolling the shores as well. Further inland, rails, gallinules, and moorhens make use of the brackish marshes.

Hydrological functions

In the Prairie State, infiltration into the sandy soils of this site in the Prairie State (1) is rapid. However, because of landscape position, this site receives seepage water from adjacent sites and may be inundated following extensive rains from both rainfall and seepage. Runoff and erosion from rainwater are seldom a problem. Occasional high tides can lead to either erosion on the site or bury the site with sand and mud, under extreme hurricane conditions; this can lead to the Hurricane Impacted State (3). Improper grazing management reduces the composition of bunchgrasses and reduces ground cover (resulting in a transition to the Midgrass Community (1.2). This decreases the function of the water cycle; infiltration declines and runoff increases due to poor ground cover, rainfall splash, low organic matter, and poor structure. Combining sparse ground cover with intensive rainfall creates conditions that increase the frequency and severity of flooding. The decline in the quality of the understory component and the increase in shrub canopy cover cause soil erosion to accelerate, surface runoff quality to decline, and sedimentation to increase. In the Shrubland State hydrology Functions in the Shrubland State (2) are similar to those in the Prairie State (1), as canopy cover is high and infiltration rapid. Under domination by woody species, especially mesquite, interception of rainfall by tree canopies increases. This reduces the amount of rainfall reaching the soil surface. The funneling effect of the canopy increases stemflow and soil moisture at tree bases. Trees have increased transpiration compared to grasses. The increased transpiration reduces the amount of water available for other plants to use. An increase in woody canopy creates a decline in grass cover, which has similar impacts as those described for improper grazing above.

Recreational uses

The beach area is a popular tourist designation throughout the year. Bird watching and saltwater fishing are other recreational uses.

Inventory data references

Information presented was derived from the Coastal Sand Range Site Description, NRCS clipping data, literature, field observations, and personal contacts with range-trained personnel.

Other references

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. and F. E. Smeins. 1991. Ecosystem-level processes. Grazing Management: An Ecological Perspective. Edited by R.K. Heischmidt and J.W. Stuth. Timber Press, Portland, OR.

Bailey, V. 1905. North American Fauna No. 25: Biological Survey of Texas. United States Department of Agriculture Biological Survey. Government Printing Office, Washington D. C.

Beasom, S. L, G. Proudfoot, and J. Mays. 1994. Characteristics of a live oak-dominated area on the eastern South Texas Sand Plain. In the Caesar Kleberg Wildlife Research Institute Annual Report, 1-2.

Bestelmeyer, B. T., J. R. Brown, K. M. Havstad, R. Alexander, G. Chavez, and J. E. Herrick. 2003. Development and use of state-and-transition models for rangelands. Journal of Range Management, 56(2):114-126.

Briske, B. B, B. T. Bestelmeyer, T. K. Stringham, and P. L. Shaver. 2008. Recommendations for development of resilience-based State-and-Transition Models. Rangeland Ecology and Management, 61:359-367.

Brown, J. R. and S. Archer. 1999. Shrub invasion of grassland: recruitment is continuous and not regulated by herbaceous biomass or density. Ecology, 80(7):2385-2396.

Butzler, R. E. 2006. The Spatial and Temporal Patterns of Lycium carolinianum Walt. M. S. Thesis. Texas A&M, College Station, TX.

Chabreck, R. H. 1972. Vegetation, water and soil characteristics of the Louisiana coastal region. Louisiana State University Agriculture Experiment Station Bulletin, 664.

Davis, W. B. 1974. The Mammals of Texas. Texas Parks and Wildlife Department Bulletin, 41.

Drawe, D. L., A. D. Chamrad, and T. W. Box. 1978. Plant communities of the Welder Wildlife Refuge. The Welder Wildlife Refuge, Sinton, TX.

Drawe, D. L., K. R. Kattner, W. H. McFarland, and D. D. Neher. 1981. Vegetation and soil properties of five habitat types on north Padre Island. Texas Journal of Science, 33:145-157.

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

Foster, J. H. 1917. Pre-settlement fire frequency regions of the United States: A first approximation. Tall Timbers Fire Ecology Conference Proceedings, 20.

Frost, C. C. 1995. Presettlement fire regimes in southeastern marshes, peatlands, and swamps. Tall Timbers Fire Ecology Conference Proceedings, 19:39-60.

Fulbright, T. E., D. D. Diamond, J. Rappole, and J. Norwine. 1990. The Coastal Sand Plain of Southern Texas. Rangelands, 12:337-340.

Fulbright, T. E., J. A. Ortega-Santos, A. Lozano-Cavazos, and L. E. Ramirez-Yanez. 2006. Establishing vegetation on migrating inland sand dunes in Texas. Rangeland Ecology and Management, 59:549-556.

Gosselink, J.D., C.L. Cordes, and J.W. Parsons. 1979. An. Ecological characterization study of the Chenier Plain Coastal Ecosystem of Louisiana and Texas. U.S. Fish and Wildlife Service, Office of Biological Services, Washington, D.C.

Gould, F. W. 1975. The Grasses of Texas. Texas A&M University Press, College Station, TX.

Gould, F. W. and T. W. Box. 1965. Grasses of the Texas Coastal Bend. Texas A&M University Press, College Station, TX.

Grace, J. B., L. K. Allain, H. Q. Baldwin, A. G. Billock, W. R. Eddleman, A. M. Given, C. W. Jeske, and R. Moss. 2005. Effects of prescribed fire in the coastal prairies of Texas. USGS Open File Report, 2005-1287.

Hamilton, W. and D. Ueckert. 2005. Rangeland woody plant control: Past, present, and future. Brush management: Past, present, and future, 3-16.

Harcombe, P. A. and J. E. Neaville. 1997. Vegetation types of Chambers County, Texas. The Texas Journal of Science, 29:209-234.

Hatch, S. L., J. L. Schuster, and D. L. Drawe. 1999. Grasses of the Texas Gulf Prairies and Marshes. Texas A&M University Press, College Station, TX.

Johnson, M. C. 1963. Past and present grasslands of southern Texas and northeastern Mexico. Ecology 44(3):456-466.

Lehman, V. W. 1965. Fire in the range of Attwater's prairie chicken. Tall Timbers Fire Ecology Conference Proceedings, 4:127-143.

Mann, C. 2004. 1491: New Revelations of the Americas before Columbus. Vintage Books, New York City, NY.

Mapston, M. E. 2007. Feral Hogs in Texas. Texas Agrilife Extension Bulletin, B-6149

McAtee, J. W., C. J. Scifres, D. L. and Drawe. 1979. Digestible energy and protein content of gulf cordgrass following burning or shredding. Journal of Range Management, 376-378.

McGowen, J. H., L. F. Brown, T. J. Evans, W. L. Fisher, and C. G. Groat. 1976. Environmental geologic atlas of the Texas Coastal Zone-Bay City-Freeport area. The University of Texas at Austin, Bureau of Economic Geology, Austin, TX.

Miller, D. L., F. E Smeins, and J. W. Webb. 1998. Response of a Texas Distichlis spicata coastal marsh following Lesser Snow Goose herbivory. Aquatic Botany, 61:301-307.

Miller, D. L., F. E. Smeins, and J. W. Webb. 1996. Mid-Texas coastal marsh change (1939-1991) as influenced by Lesser Snow Goose herbivory. Journal of Coastal Research, 12:462-476.

Miller, D. L., F. E. Smeins, J. W. Webb, and M. T. Longnecker. 1997. Regeneration of Scirpus americanus in a Texas coastal marsh following Lesser Snow Goose herbivory. Wetlands, 17:31-42.

Oefinger, R. D. and C. J. Scifres. 1977. Gulf cordgrass production, utilization, and nutritional value following burning. Texas Agricultural Experiment Station Bulletin, B-1176.

Palmer, G. R., T. E. Fulbright, and G. McBryde. 1995. Inland sand dune reclamation on the Coastal Sand Plain of Southern Texas. Caesar Kleberg Wildlife Research Institute Annual Report, 1994-1995.

Prichard, D. 1998. Riparian area management: A user guide to assessing proper functioning condition and the supporting science for lotic areas. Bureau of Land Management, Denver, CO.

Rappole, J. H. and G. W. Blacklock. 1985. Birds of the Texas Coastal Bend: Abundance and distribution. 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., 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.

Shiflet, T. N. 1963. Major ecological factors controlling plant communities in Louisiana marshes. Journal of Range Management, 16:231-235.

Singleton, J. R. 1951. Production and utilization of waterfowl food plants on the east Texas gulf coast. Journal of Wildlife Management, 15:46-56.

Smeins, F. E., D. D. Diamond, and W. Hanselka. 1991. Coastal prairie, 269-290. Ecosystems of the World: Natural Grasslands. Edited by R. T. Coupland. Elsevier Press, Amsterdam, Netherlands.

Smeins, F. E., S. Fuhlendorf, and C. Taylor, Jr. 1997. Environmental and land use changes: A long term perspective. Juniper Symposium, 1-21.

Snyder, R. A. and C. L. Boss. 2002. Recovery and stability in barrier island plant communities. Journal of Coastal Research, 18:530-536.

Stoddart, L. A., A. D. Smith, and T. W. Box. 1975. Range management. McGraw-Hill Book Co., New York, NY.

Stringham, T. K., W. C. Krueger, and P. L. Shaver. 2001. State and transition modeling: An ecological process approach. Journal of Range Management, 56(2):106-113.

Thornthwaite, C. W. 1948. An approach towards a rational classification of climate. Geographical Review, 38: 55-94.

Thurow, T. L. 1991. Hydrology and erosion. Grazing Management: An Ecological Perspective. Edited by R.K. Heitschmidt and J.W. Stuth. Timber Press, Portland, OR.

Urbatsch, L. 2000. Chinese tallow tree Triadica sebifera (L.) Small. USDA-NRCS, National Plant Center, Baton Rouge, LA.

Van’t Hul, J. T., R. S. Lutz, and N. E. Mathews. 1997. Impact of prescribed burning on vegetation and bird abundance on Matagorda Island, Texas. Journal of Range Management, 50:346-360.

Vines, R. A. 1977. Trees of Eastern Texas. University of Texas Press, Austin, TX.

Vines, R. A. 1984. Trees of Central Texas. University of Texas Press, Austin, TX.

Wade, D. D., B. L. Brock, P. H. Brose, J. B. Grace, G. A. Hoch, and W. A. Patterson III. 2000. Fire in Eastern ecosystems. Wildland fire in ecosystems: effects of fire on flora. Edited by. J. K. Brown and J. Kaplers. United States Forest Service, Rocky Mountain Research Station, Ogden, UT.

Warren, W. S. 1998. The La Salle Expedition to Texas: The journal of Henry Joutel, 1684-1687. Edited by W. C. Foster. Texas State Historical Association, Austin, TX.

Weaver, J. E. and F. E. Clements. 1938. Plant ecology. McGraw-Hill, New York, NY.

Williams, A. M., R. A. Feagin, W.K. Smith, and N. L. Jackson. 2009. Ecosystem impacts of Hurricane Ike on Galveston Island and Bolivar Peninsula: Perspectives of the coastal barrier island network (CBIN). Shore and Beach, 7(2):1-5.

Williams, L. R. and G. N Cameron. 1985. Effects of removal of pocket gophers on a Texas coastal prairie. The American Midland Naturalist Journal, 115:216-224.

Wright, H.A. and A.W. Bailey. 1982. Fire Ecology: United States and Southern Canada. John Wiley & Sons, Inc., Hoboken, NJ.

Contributors

Jack Alexander, Synergy Resource Solutions, Inc, Belgrade, MT
Dr. Fred Smeins, Texas A&M University, College Station, TX

Approval

Bryan Christensen, 9/22/2023

Acknowledgments

Reviewers: Dennis Brezina, RSS, NRCS, Bryan, TX Justin Clary, RMS, NRCS, Temple, TX Shanna Dunn, RSS, NRCS, Corpus Christi, TX Kent Ferguson, RMS, NRCS, Temple, TX Jason Hohlt, RMS, NRCS, Kingsville, TX Mike Stellbauer, RMS, NRCS, Bryan, TX Site Development and Testing Plan: Future work, as described in a Project Plan, to validate the information in this Provisional Ecological Site Description is needed. This will include field activities to collect low, medium and high-intensity sampling, soil correlations, and analysis of that data. Annual field reviews should be done by soil scientists and vegetation specialists. A final field review, peer review, quality control, and quality assurance reviews of the ESD will be needed to produce the final document. Annual reviews of the Project Plan are to be conducted by the Ecological Site Technical Team.

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)	Mike Stellbauer, Zone RMS, Bryan, TX
Contact for lead author	979-846-4814
Date	07/12/2009
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:** **Uncommon.**

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):** **Less than 20 percent bare ground randomly distributed throughout.**

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** **None, except for hurricane-induced scouring.**

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):** Stability class ranges 4 to 6 at surface. Soil surface is resistant to erosion.

---

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** 42 inches of very dark gray loamy fine sand. SOM is 1 to 2 percent.

---

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Under reference conditions, this tallgrass prairie, with adequate litter and little bare ground, 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):** 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 tallgrasses

    Sub-dominant: Warm-season midgrasses Forbs

    Other:

    Additional:

---

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Grasses due to their growth habit will exhibit some mortality and decadence, though very slight.

---

14. **Average percent litter cover (%) and depth (in):** Litter is primarily herbaceous.

---

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 3,000 to 6,800 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:** Chinese tallow, common bermudagrass, and bahiagrass are the primary invaders.

---

17. **Perennial plant reproductive capability: All species should be capable of reproducing except for periods of prolonged drought conditions, heavy natural herbivory, and intense wild fires.**