Ecological site R083AY022TX
Loamy Sand

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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): 083A–Northern Rio Grande Plain

This area is entirely in Texas and south of San Antonio. It makes up about 11,115 square miles (28,805 square kilometers). The towns of Uvalde, Cotulla, and Hondo are in the western part of the area, and Beeville, Goliad, and Kenedy are in the eastern part. The town of Alice is just outside the southern edge of the area. Interstate Highways 35 and 37 cross this area. This area is comprised of inland, dissected coastal plains.

Classification relationships

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

Ecological site concept

The Loamy Sand site has a sandy surface over a loamy or clayey subsoil. These sites are located on uplands or stream terraces.

Associated sites

R083AY020TX	**Sand Hills**
R083AY021TX	**Sandy**
R083AY024TX	**Tight Sandy Loam**
R083AY004TX	**Shallow Sandy Loam**
R083AY010TX	**Vega**
R083AY011TX	**Claypan Prairie**

R083AY012TX	**Loamy Draw**

Similar sites

R083CY022TX	**Loamy Sand**
R083EY022TX	**Loamy Sand**

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Quercus virginiana* (2) *Lantana*
Herbaceous	(1) *Schizachyrium littorale* (2) *Bothriochloa laguroides ssp. torreyana*

Physiographic features

The soils for this site formed from fluviomarine deposits and/or loamy residuum weathered from sandstone. The site can be found on interfluves of the Coastal Plains and stream terraces of river valleys. The slopes are nearly level to gently sloping. Slope gradients range from 0 to 8 percent with the majority of the slopes less than 4 percent. Elevation ranges from 200 to 1,000 feet. This area is comprised of inland, dissected coastal plains.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Interfluve (2) Coastal plain > Stream terrace
Runoff class	Negligible to high
Flooding frequency	None
Ponding frequency	None
Elevation	60 – 310 m
Slope	0 – 10 %
Aspect	Aspect is not a significant factor

Climatic features

MLRA 83A 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. Average precipitation for MLRA 83A is 20 inches on the western boundary and 35 inches on the eastern boundary. 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)	220-250 days
Freeze-free period (characteristic range)	260-370 days
Precipitation total (characteristic range)	640-810 mm
Frost-free period (actual range)	210-260 days
Freeze-free period (actual range)	250-370 days
Precipitation total (actual range)	610-940 mm
Frost-free period (average)	240 days
Freeze-free period (average)	310 days
Precipitation total (average)	740 mm

- (1) BEEVILLE 5 NE [USC00410639], Beeville, TX
- (2) CROSS [USC00412125], Tilden, TX
- (3) DILLEY [USC00412458], Dilley, TX
- (4) FLORESVILLE [USC00413201], Floresville, TX
- (5) GOLIAD [USC00413618], Goliad, TX
- (6) LYTLE 3W [USC00415454], Natalia, TX
- (7) HONDO MUNI AP [USW00012962], Hondo, TX
- (8) CHEAPSIDE [USC00411671], Gonzales, TX
- (9) CUERO [USC00412173], Cuero, TX
- (10) HONDO [USC00414254], Hondo, TX
- (11) NIXON [USC00416368], Stockdale, TX
- (12) CARRIZO SPRINGS 3W [USC00411486], Carrizo Springs, TX
- (13) KARNES CITY 2N [USC00414696], Karnes City, TX
- (14) MATHIS 4 SSW [USC00415661], Mathis, TX
- (15) PLEASANTON [USC00417111], Pleasanton, TX
- (16) TILDEN 4 SSE [USC00419031], Tilden, TX
- (17) UVALDE 3 SW [USC00419268], Uvalde, TX
- (18) CHARLOTTE 5 NNW [USC00411663], Charlotte, TX
- (19) FOWLERTON [USC00413299], Fowlerton, TX

- (20) PEARSALL [USC00416879], Pearsall, TX
- (21) POTEET [USC00417215], Poteet, TX
- (22) CALLIHAM [USC00411337], Calliham, TX

Influencing water features

Runoff is low to negligible due to the sandy surface texture.

Wetland description

N/A

Soil features

This site consists of deep to very deep, moderately well and well drained soils 50 to 80 inches over eolian sediments, alluvial sediments, and sandstone. Sandy surface thickness ranges from 10 inches to 40 inches before an increase in clay content is noticed, also called the argillic horizon. Secondary calcium carbonate is at depths deeper than 35 inches. Runoff is negligible to low. Soil series correlated to this site include: Alum, Comitas, Duval, Leming, Poth and Wilco.

Table 4. Representative soil features

Parent material	(1) Alluvium – sedimentary rock (2) Residuum – sedimentary rock (3) Eolian sands – sedimentary rock
Surface texture	(1) Loamy fine sand (2) Loamy sand
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Slow to moderate
Soil depth	130 – 200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	7.62 – 15.24 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 10 %

Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	5.6 – 7.3
Subsurface fragment volume <=3" (Depth not specified)	0 – 10 %
Subsurface fragment volume >3" (Depth not specified)	0 – 10 %

Ecological dynamics

The plant communities of this site are dynamic and community composition varies with topographic position, soil moisture, grazing, and fire. The site is subject to extreme variation in rainfall. During the years 1900 to 1983, 36 percent were drought years and 34 percent were wet years. During dry periods the amount of bare ground increases. Bare ground may predominate during droughts. Shortgrasses such as fringed signalgrass (Urochloa ciliatissima), red lovegrass (Eragrostis secundiflora), and hooded windmillgrass (Chloris cucullata), in addition to forbs, increase in abundance at the expense of the dominant midgrasses during drought.

The reference plant community was a grassland with scattered woody plants. Seacoast bluestem (Schizachyrium scoparium var. littorale), brownseed paspalum (Paspalum plicatulum), and Pan American balsamscale (Elyonurus tripsacoides) dominated moister sites. Drier sites were dominated by seacoast bluestem, brownseed paspalum, tanglehead (Heteropogon contortus), and arrow feather threeawn (Aristida purpurascens). Swales at the bottom of slopes with high soil moisture levels supported a woody community dominated by mesquite, wolfberry (Lycium spp.), and granjeno (Celtis pallida).

Historically fire maintained this site as grassland with scattered mesquite (Prosopis glandulosa) and associated woody plants. White-tailed deer (Odocoileus virginianus) and pronghorns (Antilocapra americana) were the major large herbivores on this site before colonization by Europeans. Bison (Bos bison) were infrequent visitors to the site. Continued overuse by livestock results in a decline of seacoast bluestem and an increase in Pan American balsamscale, arrow feather threeawn, hooded windmillgrass, thin paspalum (Paspalum setaceum), and forbs. Mesquite seedlings become established with lack of fire and heavy grazing. Pan-American balsamscale, arrow feather three-awn, hooded windmillgrass, and thin paspalum decline on severely grazed rangeland. Seacoast bluestem is virtually eliminated by severe grazing and is replaced by fringed signalgrass, red lovegrass, grassbur (Cenchrus spp.), and forbs. Mesquite increases in abundance with continued overuse. Once the mesquites reach sufficient size, understory shrubs including granjeno, wolfberry, and lime prickly-ash (Zanthoxylum fagara) establish beneath them forming brush mottes.

State and transition model

Figure 7. STM

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**Tallgrasses**			897-2354	

	shore little bluestem	SCLI11	*Schizachyrium littorale*	560-1681	–
	little bluestem	SCSCS	*Schizachyrium scoparium var. scoparium*	560-1681	–
	switchgrass	PAVI2	*Panicum virgatum*	280-841	–
2	**Midgrasses**			224-560	
	tanglehead	HECO10	*Heteropogon contortus*	168-336	–
	brownseed paspalum	PAPL3	*Paspalum plicatulum*	168-336	–
	crinkleawn grass	TRACH2	*Trachypogon*	168-336	–
3	**Midgrasses**			560-1569	
	silver beardgrass	BOLAT	*Bothriochloa laguroides ssp. torreyana*	336-560	–
	hooded windmill grass	CHCU2	*Chloris cucullata*	336-560	–
	Arizona cottontop	DICA8	*Digitaria californica*	336-560	–
	Texas cottontop	DIPA6	*Digitaria patens*	336-560	–
	pink pappusgrass	PABI2	*Pappophorum bicolor*	336-560	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	336-560	–
4	**Shortgrasses**			224-560	
	threeawn	ARIST	*Aristida*	112-224	–
	slender grama	BORE2	*Bouteloua repens*	112-224	–
	fall witchgrass	DICO6	*Digitaria cognata*	112-224	–
	balsamscale grass	ELION	*Elionurus*	112-224	–
	knotgrass	PADI6	*Paspalum distichum*	112-224	–
	thin paspalum	PASE5	*Paspalum setaceum*	112-224	–
	fringed signalgrass	URCI	*Urochloa ciliatissima*	112-224	–
Forb					
5	**Forbs**			67-168	
	dayflower	COMME	*Commelina*	22-56	–
	prairie clover	DALEA	*Dalea*	22-56	–
	coastal indigo	INMI	*Indigofera miniata*	22-56	–
	dotted blazing star	LIPU	*Liatris punctata*	22-56	–
	sensitive plant	MIMOS	*Mimosa*	22-56	–
	snoutbean	RHYNC2	*Rhynchosia*	22-56	–
	awnless bushsunflower	SICA7	*Simsia calva*	22-56	–
	vervain	VERBE	*Verbena*	22-56	–
6	**Forbs**			45-112	
	Forb, annual	2FA	*Forb, annual*	0-56	–
	Indian mallow	ABUTI	*Abutilon*	22-56	–
	ragweed	AMBRO	*Ambrosia*	22-56	–
	croton	CROTO	*Croton*	22-56	–
Shrub/Vine					
7	**Shrubs/Vines**			112-280	
	live oak	QUVI	*Quercus virginiana*	112-280	–
	pricklypear	OPUNT	*Opuntia*	56-112	–
	mesquite	PROSO	*Prosopis*	0-112	–
	hackberry	CELTI	*Celtis*	0-112	–
	snakewood	CONDA	*Condalia*	0-56	–
	Texan hogplum	COTE6	*Colubrina texensis*	0-56	–
	Christmas cactus	CYLE8	*Cylindropuntia leptocaulis*	22-56	–

	lantana	LANTA	*Lantana*	11-56	–
	Berlandier's wolfberry	LYBE	*Lycium berlandieri*	0-56	–
	spiny hackberry	CEEH	*Celtis ehrenbergiana*	0-56	–

Table 6. Community 1.2 plant community composition

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

Table 7. Community 1.3 plant community composition

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

Table 8. Community 2.1 plant community composition

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

Table 9. Community 2.2 plant community composition

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

Table 10. Community 3.1 plant community composition

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

Table 11. 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. Shrubland State (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

Water infiltration is rapid in the site. Therefore, runoff and soil erosion from water is seldom a problem except on cultivated and overgrazed areas.

Recreational uses

Hunting, recreation, and bird watching are common activities.

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.

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Approval

Bryan Christensen, 9/19/2023

Acknowledgments

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	04/17/2026
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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

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

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

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

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

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

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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

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

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

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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

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

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

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

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17. **Perennial plant reproductive capability:**
