USDA Natural Resources Conservation Service

Ecological site R150AY528TX
Claypan Prairie

Last updated: 9/22/2023
Accessed: 05/08/2024

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.

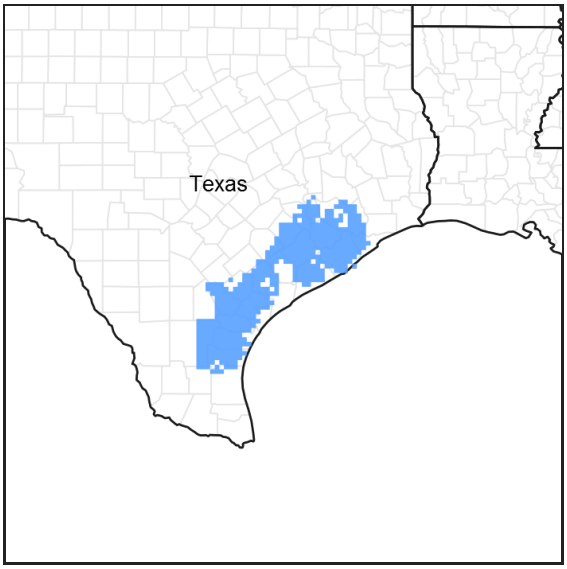


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

MLRA notes

Major Land Resource Area (MLRA): 150A–Gulf Coast Prairies

MLRA 150A is in the West Gulf Coastal Plain Section of the Coastal Plain Province of the Atlantic Plain in Texas (83 percent) and Louisiana (17 percent). It makes up about 16,365 square miles (42,410 square kilometers). It is characterized by nearly level plains that have low local relief and are dissected by rivers and streams that flow toward the Gulf of Mexico. Elevation ranges from sea level to about 165 feet (0 to 50 meters) along the interior margin. It includes the towns of Crowley, Eunice, and Lake Charles, Louisiana, and Beaumont, Houston, Bay City, Victoria, Corpus Christi, Robstown, and Kingsville, Texas. Interstates 10 and 45 are in the northeastern part of the area, and Interstate 37 is in the southwestern part. U.S. Highways 90 and 190 are in the eastern part, in Louisiana. U.S. Highway 77 passes through Kingsville, Texas. The Attwater Prairie Chicken National Wildlife Refuge and the Fannin Battleground State Historic Site are in the part of the area in Texas.

Classification relationships

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

Ecological site concept

The Claypan Prairie is a grassland site that occurs on nearly level, lower lying areas. Drainage in this site varies. The soils are characterized by a thin layer of fine sandy loam topsoil underlain by dense deep clay and clay loam subsoils.

Associated sites

R150AY535TX	**Southern Loamy Prairie** The Southern Loamy Prairie is characterized by very deep loamy soils occurring on uplands. They are vegetatively productive and provide good grazing for livestock. This site is adjacent and in a higher landform than the Claypan prairie site. It does not have a restrictive claypan and has loamier soils with much higher production.
R150AY526TX	**Southern Blackland** The Southern Blackland ecological site shows an intact grass community with small clumped dispersal of woody species. The soils are very deep, richly black in color, and characterized by their shrink-swell nature. The sites are widely distributed across the uplands and terraces throughout the region. This site is often adjacent and slightly higher in the landscape than the Claypan Prairie.
R150AY540TX	**Salty Prairie** The site is located on low lying flats. The soils have elevated levels of salts. This creates a vegetative community adapted to nutrient-poor and saline conditions. Vegetation is sparse with a few bare areas.

Similar sites

R150AY542TX	**Sandy Loam** The Sandy Loam ecological site typically has a fine sandy loam or very fine sandy loam surface with sandy clay loam subsoil horizons about 15 to 18 inches below the surface. This site is more productive than the Claypan Prairie site and the subsoil has less clay content.
R150AY543TX	**Sandy Prairie** The Sandy Prairie site has very deep soils on uplands. The soils are sandy in the upper part from 20 to 50 inches thick overlaying a loamy or clayey subsoil.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Schizachyrium scoparium* (2) *Sorghastrum nutans*

Physiographic features

The site was formed in loamy fluviomarine deposits of the Pleistocene age. They occupy nearly level flats of the Texas Coastal Plains. Slopes range from 0 to 5 percent but are mainly 0 to 1 percent. Elevation ranges from 10 to 200 feet.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Flat
Runoff class	High to very high
Flooding frequency	None
Ponding frequency	None
Elevation	3–84 m
Slope	0–1%
Ponding depth	Not specified
Water table depth	13–104 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate of MLRA 150A is humid subtropical with mild winters. The average annual precipitation in the northern two-thirds of this area is 45 to 63 inches. It is 28 inches at the extreme southern tip of the area and 30 to 45 inches in the southwestern third of the area. The precipitation is fairly evenly distributed, but it is slightly higher in late summer and midsummer in the western part of the area and slightly higher in winter in the eastern part. Rainfall typically occurs as moderate intensity, tropical storms that produce large amounts of rain during the winter. The average annual temperature is 66 to 72 degrees F. The freeze-free period averages 325 days and ranges from 290 to 365 days, increasing in length to the southwest.

Table 3. Representative climatic features

Frost-free period (characteristic range)	236-280 days
Freeze-free period (characteristic range)	365 days
Precipitation total (characteristic range)	838-1,118 mm
Frost-free period (actual range)	219-340 days
Freeze-free period (actual range)	277-365 days
Precipitation total (actual range)	838-1,219 mm
Frost-free period (average)	268 days
Freeze-free period (average)	347 days
Precipitation total (average)	991 mm

Climate stations used

- (1) BISHOP [USC00410805], Bishop, TX
- (2) ROBSTOWN [USC00417677], Robstown, TX
- (3) SINTON [USC00418354], Sinton, TX
- (4) BEEVILLE CHASE NAAS [USW00012925], Beeville, TX
- (5) REFUGIO 2 NW [USC00417533], Refugio, TX
- (6) PORT LAVACA [USC00417183], Port Lavaca, TX
- (7) VICTORIA FIRE DEPT #5 [USC00419361], Victoria, TX
- (8) DANEVANG 1 W [USC00412266], El Campo, TX
- (9) EL CAMPO [USC00412786], El Campo, TX
- (10) COLUMBUS [USC00411911], Columbus, TX

Influencing water features

Water perches on top of the argillic horizon for some time following heavy rainfall events.

Wetland description

The soils associated with this site are non-hydric except for the Vidauri series. With some sites, mall areas may exist that are hydric. Onsite investigation is necessary to determine exact local conditions.

Soil features

The representative soil features are very deep, somewhat poorly to moderately well drained with very slow permeability. Soils are nonsaline to very slight and sodicity is none to slight within the top 20 inches of the surface. Soil reaction ranges from strongly acid to neutral. Diagnostic horizons and features include an ochric epipedon typically 6 inches thick over an argillic horizon. Soils correlated to this site include: Edco, Edna, Nada, Telf, Vidauri, and Wyick.

Table 4. Representative soil features

Parent material	(1) Fluviomarine deposits–igneous, metamorphic and sedimentary rock
Surface texture	(1) Fine sandy loam (2) Very fine sandy loam (3) Loam
Family particle size	(1) Fine (2) Fine-loamy
Drainage class	Moderately well drained to poorly drained
Permeability class	Very slow
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-152.4cm)	10.16–25.4 cm
Calcium carbonate equivalent (101.6-152.4cm)	0–15%
Electrical conductivity (0-152.4cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-152.4cm)	0–4
Soil reaction (1:1 water) (0-50.8cm)	5.1–7.3
Subsurface fragment volume <=3" (101.6-152.4cm)	0–3%
Subsurface fragment volume >3" (0-152.4cm)	0%

Ecological dynamics

The Coastal Prairie was described as covered by verdant wild grass, tall and coarse. In 1846, Hughes described it as a very muddy level prairie. Major midgrass species include little bluestem (*Schizachyrium scoparium*), Florida paspalum (*Paspalum floridanum*), and brownseed paspalum (*Paspalum plicatulum*). Tallgrass species include big bluestem (*Andropogon gerardii*), switchgrass (*Panicum virgatum*), and eastern gamagrass (*Tripsacum dactyloides*). Bundleflower (Desmanthus spp.), sensitive briar (*Mimosa nuttallii*), and dotted gayfeather (*Liatris punctata*) were perennial forbs found on this site. Annual forbs occur in relatively high numbers in high rainfall years. Woody plants are excluded by competition from grasses and periodic intense fires. Native herbaceous legumes occur throughout. Water cycles, nutrient cycling, and energy capture function effectively while litter and organic matter accumulation on the site are high. Soil crusting is usually not a problem and there is minimal bare ground.

The Claypan Prairie is a relatively stable mid/tallgrass prairie. It is a highly productive site but production varies annually among species in response to rainfall, fire, and grazing pressure. Historically, it was grazed heavily by migratory bison herds. It is assumed that the frequency of grazing by bison was correlated with fire. Long deferments were common due to infrequent visits to the Texas Coast by the large herds. Fire, both winter and summer, was a more important factor shaping these sites than grazing. Because of the mild weather and high humidity, fire may have been somewhat reliant on fine fuel loads from dormant grass that resulted from intermittent use.

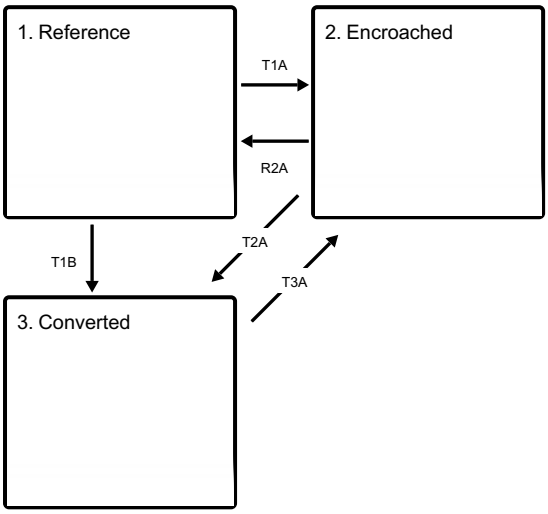
Upon the arrival of Europeans, the migratory bison were extirpated, and an introduction of wild longhorn cattle occurred in the late 1700's and domestic cattle in the 1820's. This began an era of heavy grazing. Overutilization reduced and/or eliminated the tallgrass component of the grassland as well as some midgrasses. As the site is overgrazed, low panicums, other paspalums, knotroot bristlegrass (Seteria geniculata), and long-spike tridens (*Tridens strictus*) increased in the composition. Decreases in biomass production meant less frequent and intense fires. Continued overuse of this site by livestock and the cessation of fire allowed woody plants, primarily huisache (Acacia smallii), mesquite (*Prosopis glandulosa*) baccharis (Baccharis halmifolia), and the exotic invader,

Macartney rose (*Rosa bracteata*) to establish. Increases in smutgrass (Sporobulus indicus), carpetgrass (Axonopus affinis), bahiagrass (*Paspalum notatum*), common bermudagrass (*Cynodon dactylon*), and numerous annual forbs also occur.

In addition to excessive grazing, farming to rice, corn, cotton, and grain sorghum began in the early 1900's and had a significant influence. Not only did the loss of native plant communities occur, but changes in soils, hydrology, and topography by land leveling, ditching, and leveeing also happened. Subsequent abandonment of cropping and lack of management contributed to an invasion of woody species. Restoration of tall and midgrass communities will necessitate the use of a variety of tools. Prescribed grazing is necessary coupled with brush management and/or seeding dependent upon brush densities. Once grass production increases to a point that fuel loads accumulate, fire is a viable tool.

State and transition model

Ecosystem states



T1A - Absence of disturbance and natural regeneration over time

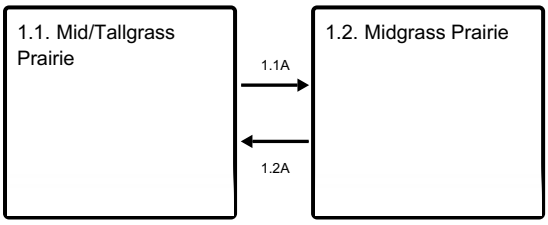
T1B - Clearing of native vegetation, followed by planting of improved forage species or annual crops

R2A - Reintroduction of fire and regular disturbance return intervals

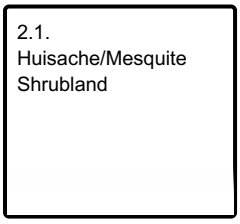
T2A - Clearing of vegetation, followed by planting improved forage species or annual crops

T3A - Absence of disturbance and natural regeneration over time

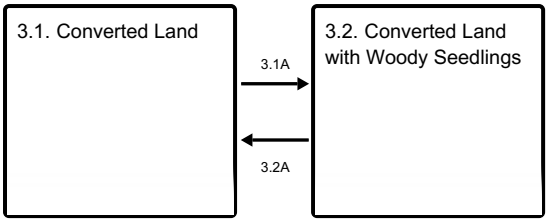
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities



State 1
Reference

The Reference state is considered to be representative of pre-Euro settlement conditions. Historically this state would have supported a highly productive tallgrass prairie. Wildfire, climate fluctuations, and grazing were important disturbances in the reference state.

Dominant plant species

- little bluestem (*Schizachyrium scoparium*), grass
- Florida pellitory (*Parietaria floridana*), grass
- brownseed paspalum (*Paspalum plicatulum*), grass

Community 1.1
Mid/Tallgrass Prairie

The reference community is a grassland of mid and tallgrasses. Midgrasses make up over 50 percent of the composition, whereas tallgrasses contribute to 30 percent, and other grasses and forbs make up the remainder. Historically coupled with bison grazing, winter and summer fires occurred every 2 to 3 years. Annual forbs occur, but mainly in response to drought, fire, and high precipitation sequences. The introduction of large numbers of cattle, combined with the concentration of herds through fencing and water locations, reduced grass fuel loads thus reducing the occurrence of fire. Heavy grazing reduced the tallgrasses in the plant composition to be replaced by midgrasses, shortgrasses, and eventually annual forbs and grasses. The Mid/Tallgrass Prairie Community (1.1) can be maintained with proper stocking rates, prescribed grazing, and prescribed burning.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	3363	4932	6165
Forb	448	560	785
Shrub/Vine	–	–	–
Tree	–	–	–
Total	**3811**	**5492**	**6950**

Figure 9. Plant community growth curve (percent production by month). TX7605, Tallgrass Prairie Community. Prairie community composed of dominant warm-season tallgrasses with some warm-season midgrasses..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1	4	12	24	24	8	5	12	4	3	2

Community 1.2
Midgrass Prairie

This community emerges as overstocking suppresses the tallgrass components of the original community. As the taller species disappear, midgrasses such as little bluestem, brownseed paspalum, and long-spike tridens increase. Annual forbs respond to drought-wet cycles and are seasonally abundant. Reduced fuel loads contribute to reduced occurrences and intensity of fire. Continued overstocking contributes to a decline in midgrasses and are replaced by

shortgrasses, forbs, and woody plants. In this community, there are usually enough remnants of the original prairie to recover once prescribed grazing is applied. The original tallgrasses will respond very favorably to the use of prescribed fire. Brush management can remove unwanted woody plants that have established.

Pathway 1.1A
Community 1.1 to 1.2

Abusive grazing and lack of fire will transition the site to Community 1.2.

Pathway 1.2A
Community 1.2 to 1.1

Prescribed grazing with correct stocking rates and a return of fire will transition Community 1.2 back to the reference community.

State 2
Encroached

The Encroached state is characterized by an increase in long-lived woody plants. Widening of the disturbance return interval has allowed woody plants do dominate the visual aspect of the community, as well as ecological processes. Increasing runoff, reducing infiltration, and changing rates of litter accumulation, nutrient cycling and biomass production.

Dominant plant species

- honey mesquite (*Prosopis glandulosa*), tree
- sweet acacia (*Acacia farnesiana*), tree
- eastern baccharis (*Baccharis halimifolia*), tree

Community 2.1
Huisache/Mesquite Shrubland

Without changes in management, the site will eventually cross a threshold into a Huisache/Mesquite Shrubland (2.1). In some scenarios, canopy densities are 100 percent and have overlaying canopies of huisache, baccharis, and mesquite. The invasion of Macartney rose is dependent upon the proximity of a seed source. Low panicums and paspalums will be the major grass species with numerous annual forbs present. Once the shrubs have gained a foothold, grazing management alone will not restore the plant community to reference conditions. As the canopy cover reaches about 25 percent, sunlight reaching the understory plants becomes a limiting factor. Major inputs, both chemical and mechanical, are necessary to restore the Grassland State (1). Very few remnants of the original vegetation are visible at this point and a technical determination will be needed to see if enough of a seed source exists for recovery. The choice of brush control method may dictate the need for seeding. Mechanical treatment will disturb the soil to the extent seeding will probably be necessary. Repeated chemical treatment and fire over many years may restore the plant community to the desired level, but monitoring will be needed to verify that the desired plants are increasing. Continuous maintenance practices will be necessary to maintain the desired plant community.

State 3
Converted

This state is characterized by the dominance of non-native species and frequent disturbance. Severe soil disturbance has occurred and this state is planted with introduced forage species or annual crops.

Dominant plant species

- Bermudagrass (*Cynodon dactylon*), other herbaceous
- beardgrass (*Bothriochloa*), other herbaceous

Community 3.1
Converted Land

The Converted Land Community is a result of land clearing, plowing, and planting to either a native rangeland mixture, introduced pasture, or farmed as cropland. Any of the plant communities can be converted, but different degrees of expense, energy, and difficulty are required. Traditional introduced species include bermudagrass and many of Old World bluestems. The amount of production is dependent upon the chosen yield goal and subsequent fertility. Converted land will require continued maintenance will be needed to keep invading brush species and weedy plants from establishing. Prescribed grazing will be needed along with the integration of brush management, pest management, and probably prescribed fire. Once any of these maintenance practices are relaxed, an invasion of shrubs will begin.

Community 3.2
Converted Land with Woody Seedlings

This plant community emerges when there is no brush management, pest management, or when the land is abandoned to recover on its own. In most cases, there will be a sufficient supply of woody plant seeds in the soil. If the land has been cropped or planted to introduced species, there is little or no seed source of native grasses left to establish within a reasonable amount of time. Moreover, it will be difficult for the native plants to establish because of the aggressive nature of the introduced forage plants. If the shrubs are small and there is a remnant of desired plants left, selective brush management or chemical brush management can change the community to a point where appropriate management can restore the desired plants. However, if the shrubs are mature, then the use of heavy equipment for land clearing and replanting is necessary. Again, if aggressive introduced plants exist, more than likely, they will be the dominant species to recover.

Pathway 3.1A
Community 3.1 to 3.2

With heavy grazing and no brush control, woody species will encroach the site.

Pathway 3.2A
Community 3.2 to 3.1

Seedling brush control, prescribed grazing, and possibly prescribed fire will transition the community back to 3.1.

Transition T1A
State 1 to 2

Heavy grazing, lack of fire, and brush invasion over 25 percent canopy signal the transition to State 2.

Transition T1B
State 1 to 3

Conversion signals this transition by preparing a seedbed and planting to pasture.

Restoration pathway R2A
State 2 to 1

Restoration occurs when brush management reduces the canopy cover below 25 percent, prescribed grazing restores correct stocking rates, and once grasses have created enough biomass, prescribed fire returns.

Transition T2A
State 2 to 3

Conversion signals this transition by clearing brush, preparing a seedbed, and planting to pasture.

Transition T3A
State 3 to 2

Without brush control to manage encroaching woody seedlings, the site will transition to State 2.

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Midgrasses**			1928–3262	
	little bluestem	SCSC	*Schizachyrium scoparium*	1121–2242	–
	brownseed paspalum	PAPL3	*Paspalum plicatulum*	560–1681	–
	sedge	CAREX	*Carex*	224–560	–
2	**Tallgrasses**			1121–2242	
	big bluestem	ANGE	*Andropogon gerardii*	560–1345	–
	Florida paspalum	PAFL4	*Paspalum floridanum*	560–1345	–
	switchgrass	PAVI2	*Panicum virgatum*	560–1345	–
	Indiangrass	SONU2	*Sorghastrum nutans*	560–1345	–
	eastern gamagrass	TRDA3	*Tripsacum dactyloides*	560–1345	–
3	**Mixed grasses**			381–695	
	fall witchgrass	DICO6	*Digitaria cognata*	56–168	–
	Pan American balsamscale	ELTR4	*Elionurus tripsacoides*	56–168	–
	gulfhairawn muhly	MUFI3	*Muhlenbergia filipes*	56–168	–
	Texas wintergrass	NALE3	*Nassella leucotricha*	56–168	–
	longtom	PADE24	*Paspalum denticulatum*	56–168	–
	panicgrass	PANIC	*Panicum*	56–168	–
	crowngrass	PASPA2	*Paspalum*	56–168	–
	marsh bristlegrass	SEPA10	*Setaria parviflora*	56–168	–
	longspike tridens	TRST2	*Tridens strictus*	56–168	–
Forb					
4	**Forbs**			381–695	
	Forb, perennial	2FP	*Forb, perennial*	56–280	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	56–168	–
	velvet bundleflower	DEVE2	*Desmanthus velutinus*	56–168	–
	button eryngo	ERYU	*Eryngium yuccifolium*	56–168	–
	dotted blazing star	LIPU	*Liatris punctata*	56–168	–
	Florida mimosa	MIQUF	*Mimosa quadrivalvis var. floridana*	56–168	–
	yellow puff	NELU2	*Neptunia lutea*	56–168	–
	lanceleaf fogfruit	PHLA3	*Phyla lanceolata*	56–168	–
5	**Forbs**			0–56	
	Forb, annual	2FA	*Forb, annual*	0–56	–
	partridge pea	CHFA2	*Chamaecrista fasciculata*	0–56	–
	snow on the prairie	EUBI2	*Euphorbia bicolor*	0–56	–
	annual marsh elder	IVAN2	*Iva annua*	0–56	–

Animal community

The Coastal Prairie communities support a wide array of animals. 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 abundant. Coyotes are abundant and fill the mammalian predator niche. Rodent populations rise during drier periods and fall during periods of inundation. Attwater's pocket gophers are abundant and have an important impact on the ecology of the site. The badger is present but not abundant in locations at the southern extent of the site. Locally unique species alligators and bullfrogs.

The region is a major flyway for waterfowl and migrating birds. Hundreds of thousands of ducks, geese, and sandhill cranes abound during winter. Two important endangered species occur in the area, the whooping crane and Attwater's prairie chicken. Many other species of avian predators including northern harriers, ferruginous hawks, red-tailed hawks, white-tailed kites, kestrels, and, occasionally, swallow-tailed kites utilize the vast grasslands. Many species of grassland birds use the site, including blue grosbeaks, dickcissels, eastern meadowlarks, several sparrows, including, vesper sparrow, lark sparrow, savannah sparrow, grasshopper sparrow, and Le Conte's sparrow.

Hydrological functions

Soils on this site are permeable until saturated. Even when dry, infiltration is slow. However, this site can develop cracks when dry and offer some high initial infiltration rates until the cracks seal. Soils become saturated quickly due to the impermeable layer that forms the claypan. Once soils are saturated, infiltration is slow to very slow. Due to the flat slope, rainfall stacks up and ponds on the site. The soil surface under reference conditions is highly resistant to erosion.

Recreational uses

Recreational uses include recreational hunting, hiking, camping, equestrian, and bird watching.

Inventory data references

The data presented in this description comes from prior range site descriptions, limited clipping data and technical interpretations from range professionals who have worked with local ranchers for many years. Vegetative data for this site was obtained from existing Range Site Descriptions and SCS-417 data. Five SCS-417's were available for this site in three different counties.

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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)	Mike Stellbauer, RMS, NRCS, Bryan, TX
Contact for lead author	979-846-0757
Date	06/08/2004
Approved by	Bryan Christensen
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:** Some water flow patterns are normal on this site due to landscape position and slopes.

3. **Number and height of erosional pedestals or terracettes:** Pedestals or terracettes would have been very uncommon for this site when occupied by the reference community.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Expect no more than 20 percent bare ground distributed in small patches.

5. **Number of gullies and erosion associated with gullies:** No gullies should be present. Drainage ways should be stable and covered with vegetation.

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

7. **Amount of litter movement (describe size and distance expected to travel):** This site has slowly permeable soils. On sloping sites, small to medium sized litter will move short distances with 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 under reference conditions is resistant to erosion. Stability class range is expected to be 4 to 5.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Greater than 13 inches thick with colors from dark brown clay loam (10YR4/3) to very dark gray clay loam (10YR3/1) and generally medium subangular blocky structures. SOM 1 to 3 percent

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial**

distribution on infiltration and runoff: Under reference conditions, the savannah of trees, shrubs, vines, grasses, and forbs with adequate litter and little bare ground provides for maximum infiltration and little runoff under normal rainfall events.

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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):** None.

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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: warm-season perennial midgrasses

    Sub-dominant: warm-season perennial tallgrasses cool-season perennial midgrasses

    Other: warm-season forbs trees shrubs/vines

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** There should be little mortality or decadence for any functional group.

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

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 3,400 to 6,200 pounds per acre.

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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:** Old world bluestems, common bermudagrass, mesquite, elm, huisache, eastern red cedar, and Macartney rose.

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17. **Perennial plant reproductive capability:** All plants should be capable of reproduction except during heavy natural herbivory, intense wildfires or extended drought conditions.
