Ecological site R083EY022TX
Loamy Sand

Last updated: 9/21/2023
Accessed: 05/17/2024

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.

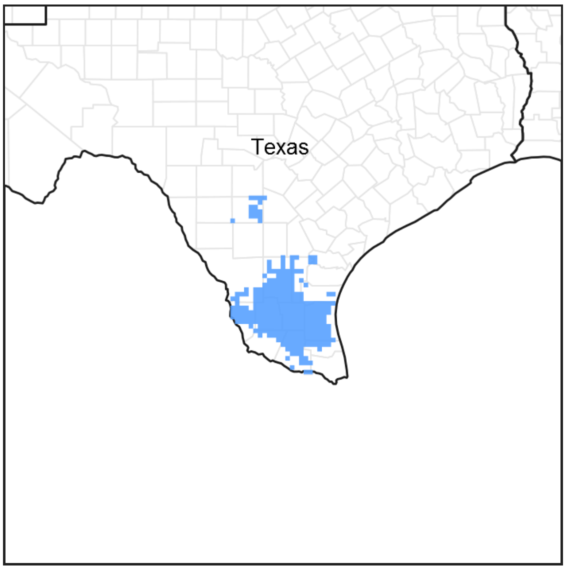


Figure 1. Mapped extent

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): 083E–Sandsheet Prairie

Major Land Resource Area (MLRA) 83E makes up about 4,300 square miles (11,150 square kilometers). The towns of Falfurrias, Premont, and Sarita are in this area. U.S. Highways 77 and 281 run through the area in a north-south direction.

Classification relationships

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

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

R083EY008TX	**Salty Prairie**
R083EY020TX	**Sand Hills**
R083EY024TX	**Tight Sandy Loam**

Similar sites

R083AY022TX	**Loamy Sand**
R083CY022TX	**Loamy Sand**

Table 1. Dominant plant species

Tree	(1) *Prosopis glandulosa*
Shrub	(1) *Zanthoxylum fagara* (2) *Celtis ehrenbergiana*
Herbaceous	(1) *Schizachyrium littorale* (2) *Chloris cucullata*

Physiographic features

The sites are found on nearly level to undulating soils formed in eolian sands of the Sand Sheet Prairie. Slope ranges from 0 to 3 percent. Elevation ranges from 20 to 750 feet with a representative elevation around 300 feet.

Table 2. Representative physiographic features

Landforms	(1) Sand plain > Sand sheet
Runoff class	Very low to medium
Flooding frequency	None
Ponding frequency	None
Elevation	6–229 m
Slope	0–5%
Aspect	Aspect is not a significant factor

Climatic features

MLRA 83 has a subtropical subhumid climate. Winters are dry and fairly warm, and the summers are hot and humid. Tropical maritime air masses predominate throughout spring, summer and fall. Modified polar air masses exert considerable influence during winter, creating a continental climate characterized by large variations in temperature. Peak rainfall 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)	235-365 days
Freeze-free period (characteristic range)	365 days
Precipitation total (characteristic range)	610-737 mm
Frost-free period (actual range)	222-365 days
Freeze-free period (actual range)	365 days
Precipitation total (actual range)	559-762 mm

Frost-free period (average)	288 days
Freeze-free period (average)	365 days
Precipitation total (average)	660 mm

Climate stations used

- (1) HEBBRONVILLE [USC00414058], Hebbronville, TX
- (2) KINGSVILLE NAAS [USW00012928], Kingsville, TX
- (3) FALFURRIAS [USC00413063], Encino, TX
- (4) MCCOOK [USC00415721], Edinburg, TX
- (5) RAYMONDVILLE [USC00417458], Raymondville, TX
- (6) SARITA 7 E [USC00418081], Sarita, TX

Influencing water features

This site is not influenced by water features.

Wetland description

N/A.

Soil features

The soils are moderately deep to very deep and well drained with a moderately slow permeability. They a have loamy fine sand or fine sand surface texture and were formed in eolian sand deposits over alluvium. Soil series correlated to this site include: Comitas, Delfina, Delmita, Padrones, and Palobia.

Table 4. Representative soil features

Parent material	(1) Eolian deposits–sedimentary rock (2) Alluvium–sedimentary rock
Surface texture	(1) Loamy fine sand (2) Fine sand
Family particle size	(1) Loamy (2) Fine-loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	7.62 cm
Calcium carbonate equivalent (0-101.6cm)	0–15%
Electrical conductivity (0-101.6cm)	0–16 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	6.1–8.4
Subsurface fragment volume <=3" (Depth not specified)	0%

Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The first crude maps labeled this area of South Texas as Nuevo Santader (1746) and later as the Wild Horse Desert (1850). Now ecologists more commonly refer to it as the Tamaulipan Biotic Province or the Mesquite Acacia Woodland. The Loamy Sand ecological site is a component of this region and is in a transitional landscape between the Sandsheet Prairie and the Central Western and Lower Rio Grande Plains. As the Sandsheet tapers off, soils begin to have different soil surface textures and the depth of the soils start to vary from very shallow (less than 10 inches) to very deep (greater than 80 inches). The Loamy Sand ecological site exhibits characteristics of both the Sandsheet Prairie and the Rio Grande Plains.

Climate is an important, sometimes downplayed, force that affects the plant communities by impacting general plant composition and diversity at a regional scale. Over the past 130 years three climatic regimes have exhibited distinct weather patterns over the American South West that can be related to the establishment of different kinds of plants (e.g. C4 grasses versus C3 shrubs). Perennial warm season grasses and plants (usually C4) benefit most when spring and summer rainfall is consistent. On the opposite spectrum, mesquite, shrubs, and cool season annuals (usually C3) can take advantage of winter rains and can also conserve energy during hot dry summers.

Droughts are a common occurrence in South Texas and were often documented in letters and historical text. For example, Captain John S. “Rip” Ford mentioned the 1864 drought in his memoirs. He reported thousands of domestic animals dead around South Texas water holes and that the Nueces River was dry for miles. Maria Von Blucher commented in 1872 that, “as a result of the tremendous drought…half of all the cattle in Texas died…at every prominence where one can overlook the Nueces River, one might count more than 3,000 dead cattle.”

Despite the dry climate, this area of Texas was a mid/shortgrass prairie, which was attractive to ranchers and early settlers. In the mid-1800’s the number of grazing animals affecting the ecosystem began to rise dramatically. In general, numbers of wild horses and cattle increased from the 1840’s through the end of the Civil War. Sheep numbers expanded to outnumber both cattle and horses between 1867 and 1900, and peaked at numbers exceeding 2 million. Since that time sheep numbers have fallen dramatically and cattle have become the principal commercial livestock. The January 2013 Texas Livestock Inventory provided by the National Agricultural Statistics Service shows that less than 500,000 head of livestock including cattle, sheep, and goats are currently being raised south of the Nueces River.

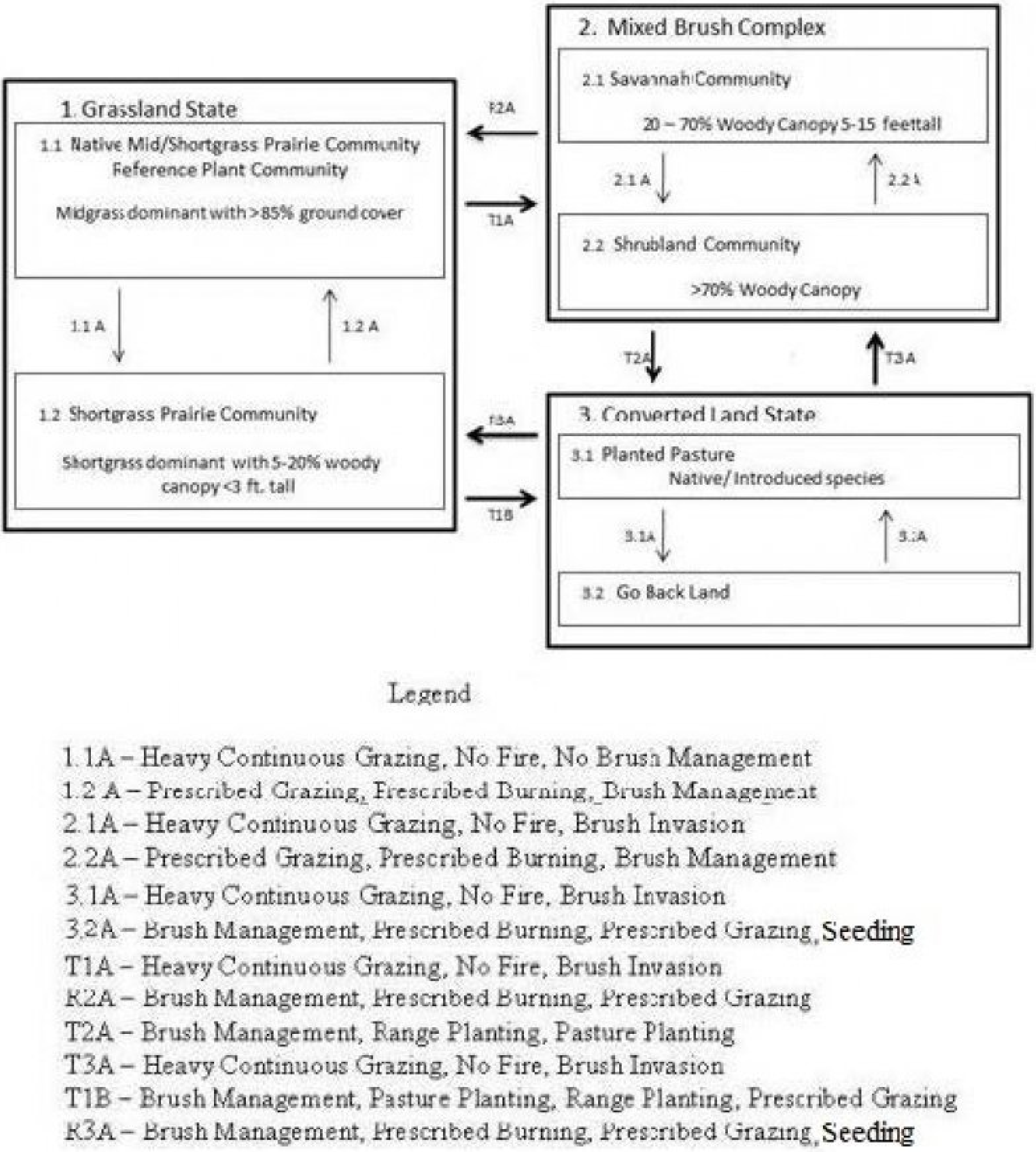
Starting in the mid-1800’s the region saw wide anthropogenic changes in several environmental disturbance regimes. Research done to investigate the transition from grassland plant communities to shrubland communities in South Texas indicates that a significant successional change across the region began 100 to 200 years ago, and that stable carbon isotope ratios indicate C3 woody plants currently occupy sites once dominated by C4 grasses. When climate and/or other disturbance regimes change to favor the establishment and spread of woody plants a transition from grassland to shrubland will occur. As grazing use increases past sustainable levels mulch, litter, and other types of ground cover start to decrease, including standing herbaceous material. The plant community structure would also change slowly from a mid/shortgrass prairie to a short grass prairie with an increase in bare ground, annual forbs, and perennial woody species. This would have had a significant impact on water runoff and infiltration rates as well as soil temperatures and historic fire regimes.

A grassland community has the intrinsic ability to compete with woody species for available water and nutrients in the soil when they are growing in the same space at the same time. Their fibrous and expansive root systems are better adapted to use the top 12 to 16 inches of the soil and there appears to be a critical one to two year period during which mesquite seedlings might be in acute competition with grasses for soil resources. As herbaceous cover decreases bare ground increases, providing more opportunity for woody species to germinate and establish. The amount of herbaceous ground cover can also have a large impact on soil surface temperatures. The higher temperature extremes of bare soil may prevent seed germination of both grasses and shrubs creating a negative feedback loop which is only broken when some type of ground cover is established.

Climate and unsustainable grazing pressure have played large roles in the conversion of South Texas grasslands to what is now called “brush country”, but another important factor is a change in the historic fire regime. The range of woody species has not significantly changed in the past 300 to 500 years, but the stature and density of shrub species has greatly increased. The historic fire regime of South Texas was highly variable with fires every five to thirty years. The variability of fires across the region would have been driven by several factors including fine fuel load but, at a local level, fires would have been frequent enough to prevent woody plant seedlings from maturing and dominating a particular area. Grasses are much better adapted to survive periodic fires and have faster regrowth rates than most shrub species but, once established; brush species in South Texas have shown the tendency to survive fires because of their re-sprouting characteristics.

Plant communities will differ across the MLRA because of the naturally occurring variability in weather, soils, and aspect. The reference plant community is not necessarily the management goal; other vegetative states may be desired plant communities if the Range Health assessments are in the moderate and above category. The biological processes on this ecological site are complex. Therefore, representative values are presented in a land management context. The species lists are representative and are not botanical descriptions of all species occurring, or potentially occurring, on this ecological site. They are not intended to cover every situation or the full range of conditions, species, and responses for the ecological site.

State and transition model



State 1
Grassland

Community 1.1
Native Mid/Shortgrass Prairie

Because of a lack of reference communities, the interpretive information for this plant community is derived from previously developed range site descriptions and professional consensus of range trained field staff. This plant community is a productive mid/shortgrass prairie with a high diversity of forb species and occasional woody plants.

The plant structure is maintained by a grazing and fire regime which recycles organic matter and nutrients from standing herbaceous material and prevents woody species from establishing dominance on the ecological site. This plant community is resistant to change and can persist through periodic droughts and other types of disturbance. On the other hand, it is not very resilient if herbaceous production and ground cover are dramatically reduced on a regular basis.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2018	3531	5044
Shrub/Vine	112	196	280
Forb	112	196	280
Total	**2242**	**3923**	**5604**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	5-10%
Grass/grasslike foliar cover	85-95%
Forb foliar cover	10-20%
Non-vascular plants	0%
Biological crusts	0%
Litter	5-10%
Surface fragments >0.25" and <=3"	0-4%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0-10%

Table 7. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	1-5%	85-95%	10-20%
>0.15 <= 0.3	–	1-5%	85-95%	10-20%
>0.3 <= 0.6	–	5-10%	85-95%	5-10%
>0.6 <= 1.4	–	5-10%	75-85%	5-10%
>1.4 <= 4	–	–	–	–
>4 <= 12	–	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

Figure 9. Plant community growth curve (percent production by month). TX8513, Mid/Tallgrass Community. Mid and tallgrasses dominate the site with few forbs and shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	10	20	15	5	10	15	10	5	5

Community 1.2
Shortgrass Prairie

Figure 10. 1.2 Shortgrass Prairie Community

Heavy grazing or absence of fire results in establishment of woody plant seedlings and a shift from dominance by midgrasses to a community dominated by shortgrasses. Plants that will increase in dominance include threeawn species (Aristida), red lovegrass (*Eragrostis secundiflora*), and hooded windmillgrass (*Chloris cucullata*). An overstory will develop consisting of 5 to 20 percent canopy cover of mesquites (*Prosopis glandulosa*) and associated woody plants under three feet tall. The forb community is highly variable. Bare ground in this phase will typically range from 10 to 30 percent with total litter cover ranging from 50 to 70 percent. Gaps in the brush canopy can range from 1 to greater than 200 feet.

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1681	2802	3923
Shrub/Vine	280	616	953
Forb	280	504	729
Total	**2241**	**3922**	**5605**

Figure 12. Plant community growth curve (percent production by month). TX5128, Shortgrass Dominant Community. Shortgrass dominates the site with decreasing midgrasses and increasing shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1	5	15	20	21	5	5	10	10	5	2

Pathway 1.1A
Community 1.1 to 1.2

This pathway represents a slow but continuous reduction in herbaceous plant production which affects many different ecological processes. Drought and grazing pressure are the main drivers for this transition, which in turn affect the fire regime. The larger bunchgrass species lose dominance and are gradually replaced with short grasses and forbs as litter cover is reduced and bare ground increases.

Pathway 1.2A
Community 1.2 to 1.1

Grazing management is key to restoring the Mid/Shortgrass Prairie Community (1.1). Sustainable grazing keeps pressure off target grass species and allows enough fine fuel to build up and support prescribed burns. In this phase fire is an effective tool that can be used to suppress woody plants and promote the grass and forb community. A prescribed burn plan with the goal of suppressing brush in the grassland state should initially be designed to have burns every three to five years. In some cases, burning may not be feasible because of weather conditions or ranch management issues. Currently, prescribed burns may also have unintended results like increased buffelgrass (*Pennisetum ciliare*) and Kleberg bluestem (*Dichanthium annulatum*), and tanglehead (*Heteropogon contortus*). In these cases, mechanical brush control practices that remove the rootcrown of re-sprouting species or herbicide that can kill target species without ground disturbance are also effective. An integrated brush management plan which utilizes fire in combination with mechanical and chemical treatments can be very effective in suppressing brush encroachment.

State 2
Mixed Brush Complex

Community 2.1
Savannah

Figure 13. 2.1 Savannah Community

Elimination of fire results in a transition from the Grassland state (1) to the Mixed Brush Complex (2) with 20 to 70 percent woody cover. Brush management and implementation of proper grazing management are required to cause a transition back to the Grassland State. This community is dominated by mesquite, but brasil (*Condalia hookeri*), lotebush (*Ziziphus obtusifolia*), granjeno (*Celtis ehrenbergiana*), and armagosa (*Castela erecta*) are also common. Bare ground in this phase will typically range from 1 to 30 percent with total litter cover ranging from 50 to 70 percent. Gaps in the brush canopy can range from 1 to 75 feet.

Table 9. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1177	2186	3194
Shrub/Vine	785	1233	1681
Forb	280	504	729
Total	**2242**	**3923**	**5604**

Figure 15. Plant community growth curve (percent production by month). TX8506, Shrubland Community, 10-30% canopy. Expansion and coalescence of live oak mottes, and establishment of mesquite and associated woody species while grass species decline..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	2	5	10	18	15	5	9	15	9	5	5

Community 2.2
Shrubland

Figure 16. 2.2 Shrubland Community

The Shrubland develops as brush species coalesce into large mottes limiting herbaceous production. A continuous brush canopy develops within each motte and the plant composition is almost exclusively composed of woody species. Herbaceous production is very low and will include plants like threeawn species, hooded windmillgrass, and plains bristlegrass (*Setaria vulpiseta*). Although mesquite is very common on this site, and can potentially create greater than 50 percent of the brush canopy cover, other co-dominant species include granjeno and lime prickly ash (*Zanthoxylum fagara*). Different sub-canopy brush species that can individually compose 0 to 30 percent of the canopy cover include brasil, armagosa, lotebush, and prickly pear (*Opuntia engelmannii*). Bare ground in this phase will typically range from 1 to 20 percent with total litter cover ranging up to 99 percent. Gaps in the brush canopy can range from 2 to 45 feet.

Table 10. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	1513	2606	3699
Grass/Grasslike	560	953	1345
Forb	168	364	560
Total	**2241**	**3923**	**5604**

Figure 18. Plant community growth curve (percent production by month). TX8507, Woodland Community, 30+% canopy. Woody canopy is greater than 30%..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	2	5	10	18	15	5	9	15	9	5	5

Pathway 2.1A
Community 2.1 to 2.2

Savannah Shrubland

The transition from Savannah (2.1) to Shrubland (2.2) occurs slowly over time and is highly dependent on weather, ground cover, competition from grasses and seed dispersal. Because there are so many factors, it is difficult to determine which areas are most susceptible to woody plant encroachment. This plant community can have a large amount of bare ground and relatively low amounts of herbaceous production, putting it constantly at risk of brush encroachment. The Savannah Phase's stability is due to the low water holding capacity of the soil surface, which may make it difficult for woody plants to germinate and survive in open areas with no ground cover.

Pathway 2.2A
Community 2.2 to 2.1

Shrubland Savannah

The Shrubland Community (2.2) is distinguished from the Savannah Community (2.1) by the increase in woody plant canopy cover, which negatively affects herbaceous production. Extreme dry weather can cause plant mortality and a decrease in woody cover, but this is a cyclic process and woody cover density can recover. Mechanical brush control will be necessary to restore the Savannah Community (2.1), because grazing and fire will not have large impacts on mature brush mottes.

State 3
Converted Land

Community 3.1
Planted Pasture

Figure 19. 3.1 Planted Pasture Community

Farming is not recommended on the Loamy Sand ecological site because of a low water holding capacity and high erosion potentials of the soil. However, the site is sometimes cultivated and used for production of watermelons and other crops. Grass pastures may also be developed with introduced grasses but are hard to maintain. Inputs such as herbicide and adequate precipitation are necessary to maintain high productivity. Now, because of the availability of seed, landowners can also replant with native species. To maintain this seeded state, herbicides must be used to control woody seedlings that invade as soon as the pasture is established. Not only is there a long-lived seed source of mesquite and other woody species, additional seeds are brought in by grazing animals and domestic livestock.

Table 11. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2242	3923	5604
Total	**2242**	**3923**	**5604**

Figure 21. Plant community growth curve (percent production by month). TX8509, Converted Land - Introduced Grass Seeding. Introduced grass pasture.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	2	5	10	18	15	5	9	15	9	5	5

Community 3.2
Go Back Land

This community develops after land has been planted to pasture and then left to fallow without management inputs. It can also develop after a mechanical brush management practice has been applied during poor weather conditions or not followed up with appropriate management practices. It is typified by low plant diversity, the dominance of woody species, very little herbaceous grass production, high amounts of annual forbs, and bare ground. Because of the seed bank present in the soil, and the constant addition of new seed from grazing/browsing animals and seed eating birds, re-infestation of woody seedlings can happen in less than five years. The production and plant community structure are highly variable in the Go Back Land Community (3.2).

Figure 22. Plant community growth curve (percent production by month). TX8512, Converted Land - Woody Seedling Encroachment.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	2	5	10	18	15	5	9	15	9	5	5

Pathway 3.1A
Community 3.1 to 3.2

The transition from Planted Pasture (3.1) to Go Back Land (3.2) occurs when pastures are left to fallow without brush management. Woody species gain a competitive advantage and a low diversity plant community typically develops.

Pathway 3.2A
Community 3.2 to 3.1

After an area has reverted to Go Back Land (3.2), land managers may want to utilize the ecological site as pasture again. From a species diversity and wildlife habitat perspective, it is usually a good idea to reclaim an area that has already been manipulated in the past, instead of clearing another, more species rich, part of the management area. Once in this phase, mechanical brush control will be necessary, and a seed bed will need to be prepared to replant introduced grasses for pasture.

Transition T1A
State 1 to 2

The transition from the Grassland State (1) to the Mixed Brush Complex (2) can happen relatively quickly if conditions favor woody plant seedlings. The shortgrass plant community is an at risk phase of the Grassland State. As bare ground increases and competition from grasses decrease, woody plants have a chance to germinate. Within as little as five years after seedling establishment, mesquite may grow too large to be effectively managed with grazing or fire, especially if the fine fuel needed to carry an effective burn is not being produced. Other brush species native to this ecological site will take significantly longer to grow out of the fire control range, but mesquite acts as a nursery plant which speeds up the transition process. Discrete mottes of brush will begin to develop as the woody plants grow, pushing the plant community into a Mixed Brush Complex (2).

Transition T1B
State 1 to 3

Land managers may want to utilize this ecological site as pastureland. After the land has been cleared and an appropriate seedbed prepared, the land can be planted to introduced grasses for pasture.

Restoration pathway R2A
State 2 to 1

Land managers may want to restore this ecological site to the Native Grassland State (1). Once in the Mixed Brush Complex (2) mechanical or chemical brush control will be necessary to make the transition. The restoration process is heavily dependent on favorable weather and patience. Land managers can plant native seed to speed up restoration efforts or can rely on seed that is already in the soil. Grazing pressure on restoration sites should be deferred for a minimum of one growing season, but it is often necessary to defer livestock grazing completely or carefully graze for years before the desired plant community can develop.

Transition T2A
State 2 to 3

Land managers may want to utilize this site as pastureland or more rarely cropland. Once in the Mixed Brush Complex (2), mechanical brush control will be necessary. Many species of brush on this site are capable of re-sprouting after top removal, which is an important factor to consider when deciding how to clear the land to plant pasture. After the land has been cleared and an appropriate seedbed prepared, the land can be planted to crops such as watermelon, sorghum, or introduced grasses for pasture.

Restoration pathway R3A
State 3 to 1

The transition from the Converted Land State (3) to the Grassland State (1) will take time and patience. In the seeded phase, Planted Pasture (3.1), if practices such as fertilizer application and weed control are stopped, prescribed grazing is applied, woody seedlings are managed, and prescribed burning is applied, this ecological site will begin the reversion back to the Grassland State (1) as seedlings of native species become established. Introduced grass species are very resilient and competitive. They can maintain dominance in a pasture for a very long time after they are planted even without careful management. In these cases, management practices such as disking or applying herbicide to kill or suppress introduced species will be necessary to achieve the transition from an introduced pasture to a native pasture. This transition may occur very slowly because introduced grasses will remain competitive and will probably always be present. This transition may also require brush management practices and the reintroduction of desirable native species through range planting.

Transition T3A
State 3 to 2

In time, this ecological site will revert to the Mixed Brush Complex (2) on its own, but usually this timeline is impractical for landowners. Prescribed grazing along with various brush management practices will be necessary to achieve this transition and allow the mixed brush community to develop. This phase is very unproductive for herbaceous plants and it could take years for desirable plant species to begin to reestablish.

Additional community tables

Table 12. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Mid/Tallgrasses**			897–2242	
	shore little bluestem	SCLI11	*Schizachyrium littorale*	673–2018	–

	shore little bluestem	SCLI11	*Schizachyrium littorale*	[illegible]	
	switchgrass	PAVI2	*Panicum virgatum*	112–392	–
2	**Midgrasses**			785–2242	
	silver beardgrass	BOLAT	*Bothriochloa laguroides ssp. torreyana*	84–336	–
	hooded windmill grass	CHCU2	*Chloris cucullata*	84–336	–
	Arizona cottontop	DICA8	*Digitaria californica*	84–336	–
	Pan American balsamscale	ELTR4	*Elionurus tripsacoides*	84–336	–
	tanglehead	HECO10	*Heteropogon contortus*	84–336	–
	brownseed paspalum	PAPL3	*Paspalum plicatulum*	84–336	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	84–336	–
	crinkleawn grass	TRACH2	*Trachypogon*	84–336	–
3	**Shortgrasses**			224–560	
	threeawn	ARIST	*Aristida*	34–56	–
	slender grama	BORE2	*Bouteloua repens*	34–56	–
	fall witchgrass	DICO6	*Digitaria cognata*	34–56	–
	red lovegrass	ERSE	*Eragrostis secundiflora*	34–56	–
	thin paspalum	PASE5	*Paspalum setaceum*	34–56	–
	fringed signalgrass	URCI	*Urochloa ciliatissima*	34–56	–
Forb					
4	**Forbs**			112–280	
	Forb, annual	2FA	*Forb, annual*	11–39	–
	awnless bushsunflower	SICA7	*Simsia calva*	11–39	–
	vervain	VERBE	*Verbena*	11–22	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	11–22	–
	whitemouth dayflower	COER	*Commelina erecta*	11–22	–
	dayflower	COMME	*Commelina*	11–22	–
	hogwort	CRCA6	*Croton capitatus*	11–22	–
	coastal indigo	INMI	*Indigofera miniata*	11–22	–
	dotted blazing star	LIPU	*Liatris punctata*	11–22	–
	littleleaf sensitive-briar	MIMI22	*Mimosa microphylla*	11–22	–
	lemon beebalm	MOCI	*Monarda citriodora*	11–22	–
	snoutbean	RHYNC2	*Rhynchosia*	11–22	–
Shrub/Vine					
5	**Shrubs/Vines**			112–280	
	honey mesquite	PRGLG	*Prosopis glandulosa var. glandulosa*	11–34	–
	lime pricklyash	ZAFA	*Zanthoxylum fagara*	11–34	–
	spiny hackberry	CEEH	*Celtis ehrenbergiana*	11–34	–
	Brazilian bluewood	COHO	*Condalia hookeri*	11–34	–
	Texan hogplum	COTET	*Colubrina texensis var. texensis*	6–17	–
	West Indian shrubverbena	LAUR2	*Lantana urticoides*	6–17	–
	Berlandier's wolfberry	LYBE	*Lycium berlandieri*	6–17	–
	Texas pricklypear	OPENL	*Opuntia engelmannii var.*	6–17	–

			lindheimeri		
	lotebush	ZIOB	*Ziziphus obtusifolia*	6–17	–
	Texan goatbush	CAERT	*Castela erecta ssp. texana*	6–17	–

Animal community

As a historic tall/midgrass prairie, this site was occupied by bison, antelope, deer, quail, turkey, and dove. This site was also used by many species of grassland songbirds, migratory waterfowl, and coyotes. This site now provides forage for livestock and is still used by quail, dove, migratory waterfowl, grassland birds, coyotes, and deer.

Feral hogs (Sus scrofa) can be found on most ecological sites in Texas. Damage caused by feral hogs each year includes, crop damage by rutting up crops, destroyed fences, livestock watering areas, and predation on native wildlife, and ground-nesting birds. Feral hogs have few natural predators, thus allowing their population to grow to high numbers.

Wildlife habitat is a complex of many different plant communities and ecological sites across the landscape. Most animals use the landscape differently to find food, shelter, protection, and mates. Working on a conservation plan for the whole property, with a local professional, will help managers make the decisions that allow them to realize their goals for wildlife and livestock.

Grassland State (1): This state provides the maximum amount of forage for livestock such as cattle. It is also utilized by deer, quail and other birds as a source of food. When a site is in the reference plant community phase (1.1) it will also be used by some birds for nesting, if other habitat requirements like thermal and escape cover are near.

Tree/Shrubland (2): This state can be maintained to meet the habitat requirements of cattle and wildlife. Land managers can find a balance that meets their goals and allows them flexibility to manage for livestock and wildlife. Forbs for deer and birds like quail will be more plentiful in this state. There will also be more trees and shrubs to provide thermal and escape cover for birds as well as cover for deer.

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

Peak rainfall periods occur in May and June from thunderstorms and in September and October from tropical systems. Rainfall events may be high, three to five inches, and intense. Extended periods (45 to 60 days) of little to no rainfall during the growing season are common. Because of the flat topography, erosion is minimal, however on more sloping aspects (greater than three percent), erosion may be very significant.

Recreational uses

The area is often used for hunting and photography.

Wood products

In the Grassland State, no wood products are available. In a Shrubland State, the site may grow large numbers of mesquite trees and these can be cut for firewood and barbecue.

Other products

Inventory data references

The data contained in this document is derived from analysis of inventories, clipping studies, and ecological interpretation from field evaluations.

Other references

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

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

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

Baen, J. S. 1997. The growing importance and value implications of recreational hunting leases to agricultural land investors. Journal of Real Estate Research, 14:399-414.

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.

Berlandier, J. L. 1980. Journey to Mexico during the years 1826 to 1834: translated. Texas State Historical Associated and the University of Texas. Austin, TX.

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

Diamond, D. D. and T. E. Fulbright. 1990. Contemporary plant communities of upland grasslands of the Coastal Sand Plain, Texas. Southwestern Naturalist, 35:385-392.

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

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

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

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

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

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

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

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.

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

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

Norwine, J. 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.

Palmer, G. R., T. E. Fulbright, and G. McBryde. 1995. Inland sand dune reclamation on the Coastal Sand Plain of Southern Texas. in the Caesar Kleberg Wildlife Research Institute Annual Report, 30-31.

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

Rhyne, M. Z. 1998. Optimization of wildlife and recreation earnings for private landowners. M. S. Thesis, Texas A&M University-Kingsville, Kingsville, TX.

Woodin, M. C., M. K. Skoruppa, and G. C. Hickman. 2000. Surveys of night birds along the Rio Grande in Webb County, Texas. In Final Report, U.S. Fish and Wildlife Service, Corpus Christi, Texas.

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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.

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Date	09/23/2013
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:** 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):** Less than five percent bare ground.

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** Because of the loamy sand surface textures of the soil slight wind erosion can occur.

7. **Amount of litter movement (describe size and distance expected to travel):** Small-to-medium sized litter may move short distances during intense storms.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil surface is resistant to erosion. Soil stability class range is expected to be 4 to 6.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface horizons are 15 to 25 inches thick; brown (7.5YR 5/4) loamy fine sand; weak, coarse prismatic structure; clear smooth boundary; Soil organic matter is less than three percent.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** A high canopy cover of bunch, rhizomatous, and stoliniferous grasses will help minimize runoff and maximize infiltration. Grasses should comprise approximately 90 percent of total annual production by weight. Shrubs will comprise about five percent by weight.

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

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live**

foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):

Dominant: Mid/Tallgrasses >

Sub-dominant: Midgrasses >> Shortgrasses > Forbs > Shrubs/Vines

Other:

Additional:

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

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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):** 2,000 to 5,000 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:** Mesquite and guineagrass are common invaders.

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17. **Perennial plant reproductive capability:** All species should be capable of reproducing, except during periods of prolonged drought conditions.
