Ecological site R134XY402LA
Southwestern Loess Terrace Prairie - PROVISIONAL

Accessed: 04/24/2024

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.

MLRA notes

Major Land Resource Area (MLRA): 134X–Southern Mississippi Valley Loess

MLRA 134, Southern Mississippi Valley Loess, is in Mississippi (39 percent), Tennessee (23 percent), Louisiana (15 percent), Arkansas (11 percent), Kentucky (9 percent), Missouri (2 percent), and Illinois (1 percent). It makes up about 26,520 square miles (68,715 square kilometers). The northern part of the area includes Paducah and Murray, Kentucky; Paragould, Jonesboro, and Forrest City, Arkansas; and Memphis, Dyersburg, Bartlett, and Germantown, Tennessee. The southern part includes Yazoo City, Clinton, and Jackson, Mississippi, and Baton Rouge, Opelousas, Lafayette, and New Iberia, Louisiana. This site is in the farthest southwest part of the MLRA in Louisiana. It is in the West Gulf Coastal Plain Section of the EPA Ecoregions in sub-section 34j, Lafayette Loess Plains. The dissected plains in this MLRA have a loess mantle that is thick at the valley wall and thins rapidly as distance from the valley wall increases. This portion of the MLRA is historically distinct from other portions of the MLRA because of its Vegetative cover was historically dominated by Herbaceous species and is part of what is locally referred to as the "Cajun Prairie".

Classification relationships

Major Land Resource Area (MLRA) and Land Resource Unit (LRU) (USDA-Natural Resources Conservation Service, 2006)
EPA Level IV Ecoregion
The Natural Communities of Louisiana - (Louisiana Natural Heritage Program - Louisiana Department of Wildlife and Fisheries) - Coastal Prairie

Ecological site concept

Nearly level, gently sloping to depressional areas on uplands or terraces, formed from loess or loess-like material with low sand content. Wet to dry prairies found on the 1st Terrace and Lower Landscape positions of the Lafayette Loess Plain portion of the "Cajun Prairie". Soils are typically saturated in winter, and often very dry to droughty in late spring and fall. Historically, trees were confined to the better drained stream sides or ridges, forming "gallery forests", and acted to divide the coastal prairie into many subunits or "coves". The intrinsic soil conditions and frequent burning from lightning strikes prevented invasion by woody trees and shrubs and maintained the prairie vegetation. Certain woody species may invade this habitat without periodic fire. The introduced species *Triadica sebifera* (=Sapium sebiferum; Chinese tallow tree) has become especially problematic, forming dense thickets or forests. Coastal Prairie vegetation is extremely diverse and dominated by grasses.

Associated sites

R134XY404LA	**Southwestern Loess Ridge Prairie - PROVISIONAL** The Loess ridge site is above this site on the landscape.

Similar sites

R150AY013LA	**Clayey Terrace Prairie** The Clayey Prairie site is similar in species composition but are found in the adjacent Gulf Coast Prairie region and are slightly less productive.
R150AY012LA	**Loamy Terrace Prairie** The Loamy Prairie site is similar in species composition but are found in the adjacent Gulf Coast Prairie region and are slightly less productive.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This part of the MLRA is in the West Gulf Coastal Plain Section of the Coastal Plain Province of the Atlantic Plain. It is located in the South West most portion of the MLRA located in Louisiana and forms the Eastern edge of the "Cajun Prairie" or Great Southwest Prairie.

It is characterized by nearly level to gently sloping plains that have low local relief and are dissected by rivers and streams that flow toward the Gulf of Mexico. The loess soils are derived from the floodplain along the Mississippi River.

Table 2. Representative physiographic features

Landforms	(1) Terrace
Flooding duration	Long (7 to 30 days)
Flooding frequency	None to occasional
Ponding frequency	None
Elevation	10–125 ft
Slope	0–3%
Ponding depth	0 in
Water table depth	9–24 in
Aspect	Aspect is not a significant factor

Climatic features

Southwest Louisiana has a warm, humid climate, with fairly long summers and relatively short winters. The result is a long growing season and abundant plant growth. Water is a definitive part of the southern Louisiana landscape, largely due to the combination of low elevation and fairly abundant rainfall in most years. Mean annual precipitation ranges from 51 to 67 inches over this region, and is fairly well distributed throughout the year. There have been very few years when less than 50 inches of precipitation has fallen. Snow is a rarity, and little more than 1 inch typically falls every few years. Growing seasons are long, typically from late February to late November. Along the Gulf Coast, it is not unusual for the lowest winter temperature to be above 30 degrees. Inland, there have been occasional blasts of cold air that have dropped temperatures into the teens and 20s, but these are rare. Hurricanes and tropical storms are an important part of the climate of southern Louisiana, with some impact occurring nearly every year in some part of the region. However, devastating storms do not occur too often, and heavy rain and storm surge are usually the biggest concerns, compared to wind damage. The following climatic data are averages from the five weather stations listed below. Temperature and precipitation may vary considerably from that listed for each month. Site specific weather data should be used for land management decisions. For site specific weather conditions, obtain data from a weather station close to the site. Information can be accessed from specific weather stations at http://www.wrcc.dri.edu/coopmap/ or http://www.wrcc.dri.edu/summary/climsmla.html.

Table 3. Representative climatic features

Frost-free period (average)	268 days
Freeze-free period (average)	302 days
Precipitation total (average)	63 in

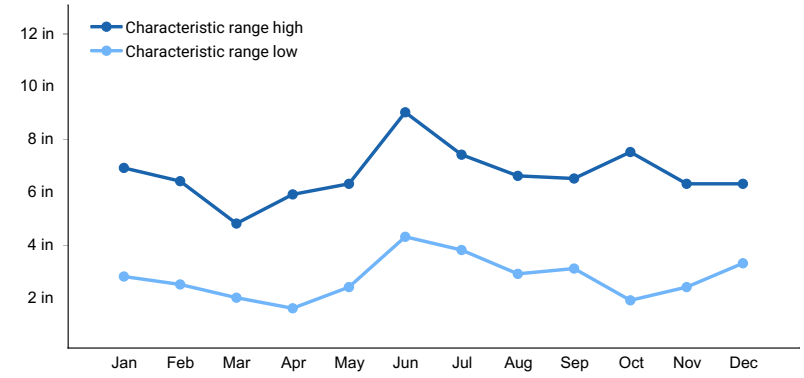

Figure 1. Monthly precipitation range

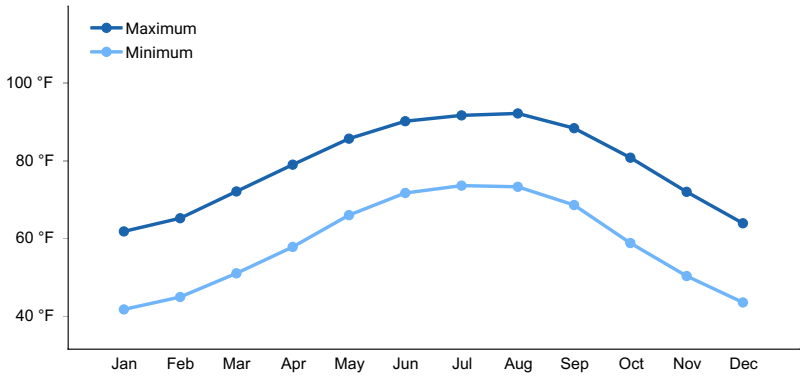

Figure 2. Monthly average minimum and maximum temperature

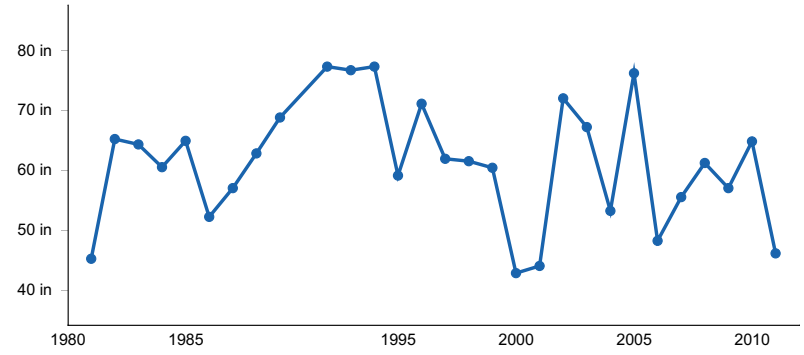

Figure 3. Annual precipitation pattern

Climate stations used

- (1) CROWLEY 2 NE [USC00162212], Crowley, LA
- (2) LAFAYETTE [USC00165021], Lafayette, LA
- (3) LAFAYETTE RGNL AP [USW00013976], Breaux Bridge, LA
- (4) NEW IBERIA ACADIANA AP [USC00166657], New Iberia, LA
- (5) GRAND COTEAU [USC00163800], Opelousas, LA

Influencing water features

Minor relief on the site will slow runoff and in places allow some accumulation. The lower portions of this site will allow for a certain amount of accumulation.

Water table depths will fluctuate according to season of the year. Typically the water table will be highest during the winter and early spring when warm season vegetation is not drawing moisture from the soil. Although ponding is not shown as a characteristic for the soils of this site, ponding may occur for brief to long periods during the growing season on micro-lows and influence the plant community. Some soils associated with this site are hydric or have hydric inclusions and may be wetlands.

Soil layers exhibit an increase in finer soil particle size percentage (clay), which can form a layer which results in reduced infiltration and percolation of soil water. The inhibition of soil water movement through the soil results in wetter soil surface conditions, and poorer drainage. Originally, the Historic Plant Community consisted of tall grass species with extensive deep roots that penetrate the soil when the soil dries and cracks during normal dry cycles. Once the roots have formed in the cracks they provide continuous pore spaces to provide internal drainage of the soil.

Soil features

The soil series associated with this site are: Patoutville, Jeanerette, Frozard, Frost, Calhoun, Acy. They are very deep to very deep, Poorly drained to Somewhat poorly drained, and Slow to Moderate permeable soils, with very acidic to neutral soil reaction.

Table 4. Representative soil features

Surface texture	(1) Silt (2) Silt loam
Family particle size	(1) Loamy
Drainage class	Poorly drained to somewhat poorly drained
Permeability class	Slow to moderate
Soil depth	80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	5.4–8.7 in
Calcium carbonate equivalent (0-40in)	0–3%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	4.8–7.8
Subsurface fragment volume <=3" (Depth not specified)	1–14%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The pre-settlement plant community of the Southwestern Loess Terrace Prairie Site on the Southwest Coastal Prairie was a tallgrass prairie. Soils, climate, fire, and grazing by native wild herbivores were the major influences on the plant community of this site. Historically Bison (Bison bison) and Elk (Cervus elapus) were the primary large ungulates that grazed the site. There are historic records that fires commonly occurred on the Southwest Coastal Prairie but none that definitively describe the frequency, timing, or intensity of fires.

Under the influences mentioned above, this prairie site was dominated by tallgrasses. Major tallgrass species include little bluestem (*Schizachyrium scoparium*), yellow Indiangrass (*Sorghastrum nutans*), big bluestem

(*Andropogon gerardii*), switchgrass (*Panicum virgatum*), and eastern gamagrass (*Tripsacum dactyloides*). Perennial forbs are an important part of the site species composition and include ashy sunflower (*Helianthus mollis*), button snake root (*Eryngium yuccifolium*), gayfeather (Liatris spp.) and goldenrod (Solidago spp.). The species composition of this site varies to include 100's of species from several families and will vary along the moisture gradient. The micro-highs and lows on this site contribute to the diverse plant community; the micro-highs are slightly drier and the micro-lows slightly wetter. Elevation differences between highs and lows range from 6 to 15 inches (15 to 34 cm). Species tolerant of moist soil grows on the lower elevations of the while less water-tolerant vegetation grows on the higher elevations.

The Loess areas adjacent to the Mississippi River valley developed under a prairie Grassland community, although there was the encroachment of Oak and Hickory. Slope was a causal factor to break the fire regimes moving towards the Valley. Attributed not to reduced fire frequency but reduced intensity. As the dissected, erosional, landscapes has less moisture available to the plants during the growing season, production is reduced providing less fuel to carry the fire. Therefore fire intensity is reduced and allowed for the establishment of initially fire tolerant woody species which shaded the herbaceous layer and caused these species to further decrease which reduced fire intensity further which allowed for the encroachment to less fire tolerant woody species. Which provided a natural transition from Herbaceous to Forested Plant communities. A similar occurrence on the northern edge of the Prairie where the initial Forest Species was the Longleaf Pine which encroached into the Prairie and utilized moisture and shaded the herbaceous layer which further reduced the production and fuel which allowed for other woody species to colonize.

Excessive grazing by domestic livestock contributes to the reduction or elimination of eastern gamagrass, big bluestem, yellow Indiangrass, switchgrass, and little bluestem. As the tallgrass species are eliminated from the site, species such as brownseed paspalum (*Paspalum plicatulum*), bushy bluestem (*Andropogon glomeratus*), knotroot bristlegrass (*Setaria parviflora*), smutgrass (*Sporobolus indicus*), and shorter stature species such as carpet grass (Axonopus sp.), dallisgrass (*Paspalum dilatatum*), bahiagrass (Paspalum notatu) and bermudagrass (*Cynodon dactylon*) increase.

In addition to site change due to excessive grazing, farming has had a significant influence on the site. The site was not only changed through the loss of native plant communities from cultivation, but also through the change in soils, hydrology, and topography by ditching, and leveeing. Continued overuse of the site by livestock, lack of fire, or abandonment of cropping allows woody plants to invade. These woody pioneers include eastern baccharis (Baccharis halamifolia), hackberry (Celtis sp.), ash (Fraxinus sp.), and chinese tallow (*Triadica sebifera*).

As the plant community transitions from Tallgrass Prairie (1.1) to the Converted States (3, 4, 5 & 6), changes occur in plant composition, biomass production, litter accumulation, and water infiltration and storage. These changes influence most treatment alternatives including the ability to use fire as a management tool. The result has been the transition of this Southwestern Loess Terrace Prairie Ecological Site from a true prairie to Cropland, Pastureland, wooded grassland or Woodland.

The resulting increase in woody plant density signifies that a threshold has been crossed. Once this threshold is crossed, restoration back towards the historic plant community becomes much more difficult and expensive. Even though a plant community similar to the historic community may be restored through the use of a combination of practices such as brush management, re-seeding, prescribed grazing, and fire, this community cannot be maintained without the continuous use of these tools on a frequent basis. Also the expansive soil disturbance associated with transition to a converted state removes soil micro environmental factors which make restoration to the Historic Grassland State (1) highly unlikely.

Soil micro environmental factors that are limited in restoration include the native soil micro flora and fauna. The natural soil ecosystem is largely unknown and undocumented but there is variability in the macro flora from the various remnants that are found across the range of this site. These variations can easily be extrapolated into variability within the Micro flora and fauna for each location.

State and transition model

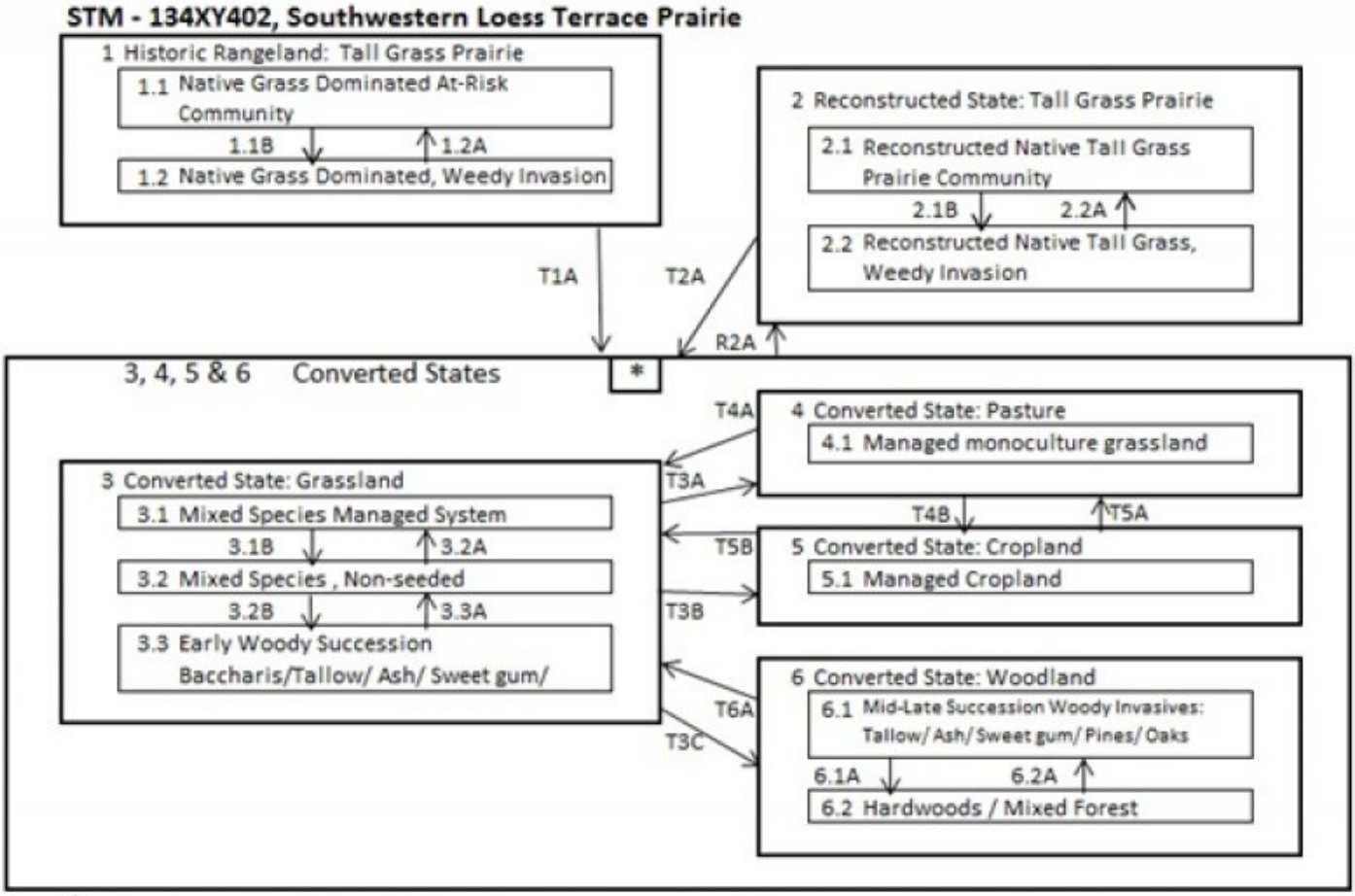

Figure 5. STM-134XY402_Southwestern_Loess_Terrace_Prairie-PE

STM Legend -134XY402, Southwestern Loess Terrace Prairie

Refer to narrative in the Plant Community Section for detailed descriptions of these transitions/pathways.

Community Pathways Legend

T1A	Plow and convert site to cultivation
T2A	Seeding, fertilizing, Management or Lack of Succession Manipulation
R2A	Seeding & Management for desired composition of Native Species
1.1B, 2.1B	Lack of disturbance: Mowing, burning, herbivory.
1.2A,2.2A	Succession Manipulation: burning, mowing, herbivory.
T3A, T3B	Seeding, fertilizing, management/ brush mgmt./ removal of unwanted plants
T3C	Lack of disturbance: Mowing, burning, herbivory or brush mgmt.
3.1B, 3.2B	Lack of disturbance: Mowing, burning, herbivory.
3.2A	Seeding & Management for desired species composition
3.3A	Succession Manipulation, Woody control.
T4A, T5B	Abandonment or Seeding & Management for desired composition
T4B, T5A	Seeding, fertilizing, Management for desired species
T6A	Clear cut, Clearing or Catastrophic Disturbance
6.1A	Abandonment or No Succession manipulation
6.2A	Timber Harvest or catastrophic disturbance

Figure 6. STM_Legend-134XY402_Southwestern_Loess_Terrace_Pra

State 1

Historic Rangeland: Tall Grass Prairie

This state is a mixed grassland community that is the native grassland historic community. This community state can be highly productive and provides beneficial habitat for wildlife species.

Community 1.1
Native Grass Dominated At-Risk Community

This plant community historically covered 2.5 million acres that once dominated southwest Louisiana, it also represents historic reference plant community. As of 1999, less than 100 acres remain, making it one of our most endangered rangeland ecosystems. Most of the few remaining remnants of prairie in Louisiana are found on narrow strips of land along railroad tracks, small areas outside the reach of tillage, and some units within grazing systems and wildlife refuges. Despite the small size of these remnants, most contain high diversity of native tallgrass prairie flora. Nearly 1,000 plant species have been identified in Coastal Prairie and almost all are perennials. Conversion of these sites occurred over most of the region by plowing and planting crop species or repeated and severe grazing, which removed excessive leaf material preventing herbaceous plants from recovering, a practice which favored non native sod forming plant species. If this site has been cultivated and farmed, restoration to a plant community can be achieved by rangeland seeding; however, the plant community and soils will never completely resemble native undisturbed conditions i.e., soil structure and soil microorganism species. Historically, this native plant community was grazed by bison, usually short periods of intense grazing followed by long periods of rest. Historically, grazing by bison accelerated nutrient cycling, removed and assisted in more rapid litter decomposition, and promoted plant diversity. Native Americans traditionally burned the prairie because the lush new growth attracted bison and other wildlife species. Fire is a required natural disturbance that maintains ecosystem health and reduced woody species invasion. The prairie is a disturbance dependent ecosystem where a combination of periodic grazing and fire maintained the integrity of the plant community.

Community 1.2
Native Grass Dominated, Weedy Invasion

Historic Disturbances of the Historic Rangeland Tall Grass Community included fire and large herbivore grazing by bison and at time intense grazing followed by long periods of recovery. The bison grazing accelerated nutrients cycling through grazing, removed any decadent plants and promoted plant species diversity. Fire, set by storms or Native Americans recycled minerals and nutrients, retarded the invasion of woody species and increased the quality of the plants. Bison would be attracted to these burned areas. The combined effect of fire and grazing over long periods of time kept the prairie functioning. This disturbance driven community was ever evolving with shifts in species composition, with time of year, climatic variability and disturbance type. This community phase is noted when the plant materials have grown for extended periods without disturbance. When this phase is reached if the Historic Prairie is the desired community, Prescribed Fire is needed to set back succession. If not a Threshold will be crossed that will require input of energy and expense to return the site to a previous phase.

State 2
Reconstructed State: Tall Grass Prairie

This state is a mixed grassland community that resembles the native grassland historic community. This is an attempt to reconstruct the species composition to the site. This community state can be highly productive and provides beneficial habitat for wildlife species.

Community 2.1
Reconstructed Native Tall Grass Prairie Community

This Community represents a reseeded restoration resembling the historic plant community on the site. Due to the large diversity of plant species, it is impossible to create the natural historic populations of grasses and forbs (wildflowers). Also, seed of the original plant species are not available in the commercial market place. After restoration practices have succeeded and stands are well established, an assortment of conservation management practices must be applied to maintain the integrity of the plant community. Common rangeland management practices include range planting, brush management, prescribed fire, and proper grazing management. If a site is destructively grazed, soils compacted during wet and saturated soil conditions, utilized as a feeding area, or mechanically disturbed where plant crowns and/or roots are damaged, the competitive effects of the native plants

are decreased allowing increased invasion by woody (native and non-native species) and invasive and/or exotic herbaceous plants. Full Restoration to the Historic Plant Community is not possible due to the lack of local eco-types of the native plant species as well as an altered soil microbial community; however, a facsimile of the natural prairie can be achieved and maintained.

Community 2.2
Reconstructed Native Tall Grass, Weedy Invasion

Historic Disturbances of the Historic Rangeland Tall Grass Community included fire and large herbivore grazing by bison and at time intense grazing followed by long periods of recovery. The bison grazing accelerated nutrients cycling through grazing, removed any decadent plants and promoted plant species diversity. Fire, set by storms or Native Americans recycled minerals and nutrients, retarded the invasion of woody species and increased the quality of the plants. Bison would be attracted to these burned areas. The combined effect of fire and grazing over long periods of time kept the prairie functioning. This disturbance driven community was ever evolving with shifts in species composition, with time of year, climatic variability and disturbance type. This community phase is noted when the plant materials have grown for extended periods without disturbance. When this phase is reached if the Historic Prairie is the desired community, Prescribed Fire is needed to set back succession. If not a Threshold will be crossed that will require input of energy and expense to return the site to a previous phase.

State 3
Converted State: Grassland

This state is a mixed grassland community that results from the native grassland historic community being altered by cultivation, destructive grazing or other site alterations. The species composition may include a variety of species native or introduced, grasses, grass likes, forbs, legumes, and some woody species.

Community 3.1
Mixed Forage Species Managed

This community is characterized by mixed species composition of grasses and legumes, which naturally establishes. Typically, perennial warm season grasses are the foundation of the stand which is periodically overseeded with adapted cool season forages to extend the grazing season. This community phase can be highly productive for grazing and haying operations and can provide beneficial habitat for some wildlife species. Maintenance of grass stands also requires management including a collection of management practices such as Prescribed Grazing, Prescribed burning, Brush Management, Pest Management, and Nutrient Management to maintain production of the desired species. Prescribed Grazing includes maintaining proper grazing heights, timing, and stocking rates. Pasture and Hayland Groups: 8F, 8G, 8H or 8I Management Interpretations: Generally, application of fertilizer and lime, and installation and maintenance of permanent pasture drainage is needed to establish and maintain improved desirable pastures. The exception to this is for bahia and common bermudagrass. These can be sustained under natural fertility and pH levels with implementation of prescribed grazing in areas that have adequate surface drainage to avoid ponding. Introduced legumes require higher pH, phosphorus, and potassium levels than most grasses. Introduced grasses, such as hybrid bermudagrasss, require a higher level of sustained fertility, a maintained pH above 6.0, and good surface drainage, to persist. Implementation of prescribed grazing of deep rooted hybrid bermudagrasses and native tall grass species with a specific goal of growing roots down past a depth of 10 to 17 inches into the nutrient rich clayey and more pH favorable, slightly acid to neutral sub soils. This is done in order to tap into the reservoir of available nutrients and moisture, in order to increase production and sustain desirable forages. To prevent extreme acidity in the subsoil when high rates of acidifying nitrogen are used, the surface soil should not be allowed to become more acid than 5.0 pH and lime should be applied at more frequent intervals. These soils may require addition of surface drainage in order to be moderately or highly productive. They have a limitations for grazing winter annuals due to seasonal wetness and a water table that is not far below the soil surface. Adapted Grasses and Legumes: Bahia, dallis, and common bermuda grasses are adapted and naturalized forage species. The adapted cool season legumes are white clover, winter peas, and vetch. White clover requires a higher level of calcium and phosphorus than peas or vetch. Annual ryegrass, white clover, and berseem clover are the best suited winter forages due to their tolerance of wet soil conditions. Jiggs and Alicia hybrid Bermuda grasses are the most persistent and sustainable varieties on this site, due to persistent and seasonal wetness of the site. Without application of fertilizer, lime, and cultural practices such as mowing and use of herbicides, these soils will normally support a cover of grasses such as silver bluestem, slender bluestem,

threeawns, broomsedge, vaseygrass, and carpetgrass, and forbs such as dogfennel, blackberry, ragweed, coffeeweed, dewberry, and sumpweed. Production Estimates – Use production estimates to determine the annual or seasonal amount of forage available for grazing. The harvest efficiency has been predetermined, thus forage production reflects the total amount of forage available for grazing, not the total amount of forage. The production table below shows the estimated yield for common forage Species grazed in Louisiana. Not all forages are depicted in the table.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	2000	3400	4800
Total	**2000**	**3400**	**4800**

Community 3.2
Mixed Species, Non-Seeded

This community is characterized by a stand where mixtures of native and naturalized non-native species occur after abandonment of cropping i.e., idle cropland. This state represents low inputs after cropping, no initial seeding of pasture species or periodic overseeding of adapted forage species. Forage is usually grazed and/or harvested as stored forage, hay or haylage. Common established species may include Bermudagrass, Bahia grass, Vasey grass, and carpet grass. This state is productive, forage and grazing management can maintain plant stands and protect soils from excessive runoff and erosion. A common peril associated with this phase is overgrazing which favors less productive and less palatable weedy species. Proper stocking rates and/or grazing systems that allow for adequate rest and plant regrowth are required to maintain productivity. When forage species are afforded adequate recovery time between grazing intervals they will develop deeper root systems and greater leaf area allowing for the capture of greater solar energy, where photosynthesis fixes carbohydrates for plant growth. Conversely when plants are not allowed to recover adequately, root development will be restricted and forage and biomass production will be reduced. Maintenance of grass stands also requires Pest Management for control of unwanted weedy and woody species.

Community 3.3
Early Woody Succession: Baccharis/Tallow/ Ash/ Sweet gum/ Pines

This community is characterized by a diverse species composition of grasses and forbs with an increasing composition of woody species (native and non-native) that are immature and low stature. If this state is not properly managed, and no brush management measures are taken, the plant community will transition to the Woodland Converted State (6). Control of woody species will require input of extensive resources to return to a Grassland or Cropland state. Conservation practices can include Prescribed Grazing, Prescribed Burning, Mowing, Disking or Herbicide treatments to manage undesired plants. Removing or reducing woody plants by disking or mowing should be implemented early before mechanical treatments are not effective. If a managed woodland (pines/hardwood) is the desired community, proper management is required. Some Invasive woody species, such as tallow trees (*Triadica sebifera*), will invade and grow to produce seeds in as few as 3 years. This phase can be beneficial habitat for some wildlife species. Woody invasive species grow quickly and plant densities and size can be difficult and expensive to control. Restoration potential to grassland becomes increasingly problematic as this vegetation state matures and transitions to a Mature Woodland Converted State.

State 4
Converted State: Pasture

This state is a grassland community that results from the native grassland historic community being altered by cultivation, destructive grazing or other site alterations. This is an intensively managed state of this site. It will be characterized by monoculture hayland or Pasture. This is a common state occurring on this site.

Community 4.1
Managed monoculture grassland

Typically, this state is characterized by planting forage species for hay production. Forage plantings generally consist of a single grass species. Introduced native and/or non-native forage species can be seeded. Forage is usually harvested as hay or haylage, although grazing may occur periodically. These sites are highly productive for forage and can provide ecological benefits similar to that of the native grasslands to control soil erosion. Allowing for adequate rest and regrowth of desired species is required to maintain productivity. Maintenance of monoculture stands also requires control of unwanted species which will require Pest Management and Nutrient Management to maintain the needed fertility for production of the species. Pasture and Hayland Suitability Group – 8F, 8G, 8H or 8I Management Interpretations: Generally, application of fertilizer and lime, and installation and maintenance of permanent pasture drainage is needed to establish and maintain improved desirable pastures. The exception to this is for bahia and common bermudagrass. These can be sustained under natural fertility and pH levels with implementation of prescribed grazing in areas that have adequate surface drainage to avoid ponding. Introduced legumes require higher pH, phosphorus, and potassium levels than most grasses. Introduced grasses, such as hybrid bermudagrasss, require a higher level of sustained fertility, a maintained pH above 6.0, and good surface drainage, to persist. Implementation of prescribed grazing of deep rooted hybrid bermudagrasses and native tall grass species with a specific goal of growing roots down past a depth of 10 to 17 inches into the nutrient rich clayey and more pH favorable, slightly acid to neutral sub soils. This is done in order to tap into the reservoir of available nutrients and moisture, in order to increase production and sustain desirable forages. To prevent extreme acidity in the subsoil when high rates of acidifying nitrogen are used, the surface soil should not be allowed to become more acid than 5.0 pH and lime should be applied at more frequent intervals. These soils are require addition of surface drainage in order to be moderately or highly productive. They have a limitation for grazing winter annuals due to seasonal wetness and a water table that is not far below the soil surface. Adapted Grasses and Legumes: Bahia, dallis, and common bermuda grasses are adapted and naturalized forage species. The adapted cool season legumes are white clover, winter peas, and vetch. White clover requires a higher level of calcium and phosphorus than peas or vetch. Gulf annual ryegrass, white clover, and berseem clover are the best suited winter forages due to their tolerance of wet soil conditions. Jiggs and Alicia hybrid Bermuda grasses are the most persistent and sustainable varieties on this site, due to persistent and seasonal wetness of the site. Without application of fertilizer, lime, and cultural practices such as mowing and use of herbicides, these soils will normally support a cover of grasses such as silver bluestem, slender bluestem, threeawns, broomsedge, vaseygrass, and carpetgrass, and forbs such as dogfennel, blackberry, ragweed, coffeeweed, dewberry, and sumpweed. Production Estimates – Use production estimates to determine the annual or seasonal amount of forage available for grazing. The harvest efficiency has been predetermined, thus forage production reflects the total amount of forage available for grazing, not the total amount of forage. The production table below shows the estimated yield for common forage Species grazed in Louisiana. Not all forages are depicted in the table.

State 5
Converted State: Cropland

This state is cropland that results from the native grassland historic community being altered by cultivation or other site alterations. This is an intensively managed state of this site. It will be characterized by monoculture cropland.

Community 5.1
Managed Cropland

This state represents a crop production field. Annual plantings for forage production would also be included in this phase, which may include cool season annual grasses and legumes and warm season forage species. Vegetable crops are grown on this site and are generally on a small scale. Sugarcane, Sweet potatoes, Corn and Soybeans are dominant crops and can be planted on fields with adequate management. Wheat may be included in the rotation or as a standalone crop. Other row crop species have been produced on this site. Often 2 or more crops will be grown in a multiyear rotation, this breaks pest cycles and some crops produce higher amounts of residue, which is left on the soil to improve soil health. Maintenance of monoculture crop stands also requires control of unwanted species, which will require Pest and Nutrient Management to maintain the needed fertility for production of the desired species. Refer to E-Field Office Technical Guide and the local NRCS Field Office for management assistance.

State 6
Converted State: Woodland

This community results from the native grassland historic community being altered and is characterized by the Woodland Converted State. The species occurring in this state are woody and have become mature. This state may be achieved by planting and managing woody species or by invasion without management. This is a common Community for this site.

Community 6.1
Mid-Late Succession Woody Invasives: Tallow/ Ash/ Sweet gum/ Pines/ Oaks

This community has crossed a threshold from Early Woody Succession Baccharis/Tallow/Ash/Sweet Gum/Pines to a more mature Woodland Converted State. Tallow Trees are well established and will create a closed woody canopy in a very few years. As the tallow trees mature and densities increase, the understory is shaded out and forage species disappear. These stands become unproductive for forage. Restoration of this site to productive grassland or a Hardwoods/Mixed forest becomes more difficult and expensive. Residual tallow seed will repopulate stands without continued woody management. Before complete canopy closure and die off of understory forage, this phase can provide beneficial habitat for some wildlife species. Refer to Woodland Suitability Group Datasheets in E-Field Office Technical Guide for suitable species and the local NRCS Field Office for management assistance.

Community 6.2
Hardwoods / Mixed Forest

This phase represents stands of mature tree species, either planted or naturally regenerated. Invasive woody species may be controlled (mechanically and/or chemically) and desirable hardwoods and/or pines are maintained. This phase can provide beneficial habitat for some wildlife species. If dual use of timber production and grazing is desired, proper grazing use must be employed to minimize disturbance to tree species. Adequate tree spacing must be provided to allow solar energy to reach the ground for forage production. If timber production is desired, periodic brush management may be required to minimize competition from undesirable woody plants. Due to rainfall, drainage and soil properties, harvest limitations exist and will require attention for the conservation of the natural resources. Refer to Woodland Suitability Groups 2w5, 1w8, 1o7 or 2w9 Datasheets in E-Field Office Technical Guide and the local NRCS Field Office for management assistance.

Pathway 6.1A
Community 6.1 to 6.2

Abandonment or No Succession manipulation: This occurs when the site is seeded & managed for the desired production of selected woody species or a lack of management and woody invaders are allowed to grow to maturity. The transition trigger is when the composition of the stand is reaching a mature age stand.

Transition 1A
State 1 to 3

Plow and convert site to cultivation: When the native tall grass community is removed by plowing or overgrazing and non-native species are planted are allowed to colonize the site. This transition has occurred on the majority of the landscape for managed agricultural production.

Additional community tables

Table 6. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Warm Season Grasses**			2000–4800	
	Bermudagrass	CYDA	*Cynodon dactylon*	2000–4800	0–98

Table 7. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Warm Season grasses**			5000–11400	
	Bermudagrass	CYDA	*Cynodon dactylon*	5000–11400	70–95

Table 8. Community 5.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Forb					
1	**Crop Species**			0	
	soybean	GLMA4	*Glycine max*	0	0
	sweetpotato	IPBA2	*Ipomoea batatas*	0	0
	sugarcane	SAOF	*Saccharum officinarum*	0	0
	corn	ZEMA	*Zea mays*	0	0

Animal community

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Hydrological functions

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Recreational uses

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Wood products

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Other products

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Other information

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Contributors

D Charles Stemmans II

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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	
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):**

   _____

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):**

---

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:**