USDA Natural Resources Conservation Service

Ecological site R150AY541TX
Sandy Bottomland

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General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

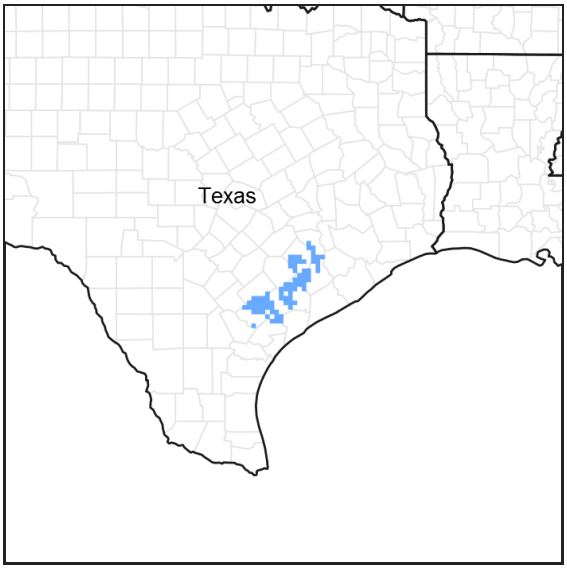


Figure 1. Mapped extent

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 ecological site has very deep, somewhat excessively drained soils that are occasionally or frequently flooded. Flooding may occur at any time during the year but the winter and spring months are the most common. Due to the position on the landscape and coarse-textured soils, these sites drain quicker and do not stay flooded as long as the loamy and clayey bottomlands sites. The drainage patterns and sandy soils create their unique plant community.

Associated sites

R150AY527TX	**Clayey Bottomland** The Clayey Bottomland site has very deep, clayey surface textured soils that occur on flood plains. The areas can be flooded and ponded for lengthy durations throughout the year.
R150AY534TX	**Loamy Bottomland** Loamy Bottomland is on river valley floodplains. In many cases, this site is on the lowest position on the landscape. The soils formed in loamy alluvium. The hazard of flooding occurs on these sites.

Similar sites

R150AY534TX	**Loamy Bottomland** Loamy Bottomland is on river valley floodplains. In many cases, this site is on the lowest position on the landscape. The soils formed in loamy alluvium. The hazard of flooding occurs on these sites.

Table 1. Dominant plant species

Tree	(1) *Quercus virginiana*
Shrub	(1) *Ilex vomitoria*
Herbaceous	(1) *Panicum virgatum* (2) *Elymus virginicus*

Physiographic features

These nearly level soils are on natural levees of streams. Slope ranges from 0 to 1 percent. Due to its proximity to steams, flooding occurs occasionally to frequently.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Levee
Runoff class	Negligible
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Occasional to frequent
Elevation	15–91 m
Slope	0–1%

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)	243-262 days

Freeze-free period (characteristic range)	365 days
Precipitation total (characteristic range)	1,092-1,245 mm
Frost-free period (actual range)	234-264 days
Freeze-free period (actual range)	365 days
Precipitation total (actual range)	1,041-1,245 mm
Frost-free period (average)	252 days
Freeze-free period (average)	365 days
Precipitation total (average)	1,143 mm

Climate stations used

- (1) VICTORIA FIRE DEPT #5 [USC00419361], Victoria, TX
- (2) BAY CITY WTR WKS [USC00410569], Bay City, TX
- (3) SEALY [USC00418160], Sealy, TX
- (4) NEW GULF [USC00416286], Boling, TX
- (5) EL CAMPO [USC00412786], El Campo, TX
- (6) PORT LAVACA [USC00417183], Port Lavaca, TX

Influencing water features

Soil flood occasionally to frequently, but due to their coarse textures, flood water drains off quickly.

Wetland description

The site has non-hydric soils. Some sites have small areas that are hydric. These hydric areas are usually located in depressions that stay wet for long periods. Onsite investigation is necessary to determine exact local conditions.

Soil features

The site consists of very deep, somewhat excessively drained soils that formed in sandy alluvium of Holocene age. Soils correlated to this site include: Zalco.

Table 4. Representative soil features

Parent material	(1) Alluvium–igneous, metamorphic and sedimentary rock
Surface texture	(1) Sand (2) Fine sand
Drainage class	Somewhat excessively drained
Permeability class	Moderately rapid
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-152.4cm)	10.16–12.7 cm
Calcium carbonate equivalent (0-152.4cm)	0–10%
Electrical conductivity (0-152.4cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-152.4cm)	0–2

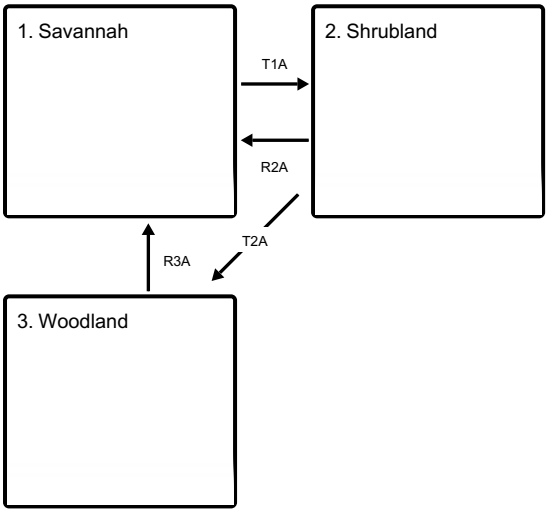
Soil reaction (1:1 water) (0-152.4cm)	6.1–8.4
Subsurface fragment volume <=3" (0-152.4cm)	0–5%
Subsurface fragment volume >3" (0-152.4cm)	0%

Ecological dynamics

Presence of shade and proximity to water make this bottomland site a preferred grazing area. Bison herds scour erosion from flooding, and extreme climatic fluctuations probably had a major influence on the maintenance of the savannah landscape before European colonization. Fire may have had some influence compared to the Loamy and Clayey Bottomland sites as the Sandy Bottomland site tends to be droughtier and more susceptible to fire. Switchgrass (*Panicum virgatum*), Virginia wildrye (*Elymus virginicus*), little bluestem (*Schizachyrium scoparium*), and big bluestem (*Andropogon gerardii*) decrease in abundance and are replaced by midgrasses, shortgrasses, and eventually forbs when continuous grazing occurs. Shrubs and hardwood saplings invade in the absence of proper grazing and brush management. Prolonged mismanagement or abandonment allows the site to become a hardwood forest dominated by eastern cottonwood (*Populus deltoides*), water oak (*Quercus nigra*), elm (Ulmus spp.), ash (Fraxinus spp.), and pecan (Carya illinoisensis).

State and transition model

Ecosystem states



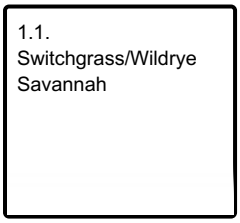
T1A - Absence of disturbance and natural regeneration over time

R2A - Reintroduction of fire and regular disturbance return intervals

T2A - Absence of disturbance and natural regeneration over time

R3A - Reintroduction of fire and regular disturbance return intervals

State 1 submodel, plant communities



State 2 submodel, plant communities

2.1. Shrubland

State 3 submodel, plant communities

3.1. Woodland

State 1
Savannah

Dominant plant species

- cottonwood (*Populus*), tree
- elm (*Ulmus*), tree
- Indiangrass (*Sorghastrum nutans*), grass
- beaked panicgrass (*Panicum anceps*), grass

Community 1.1
Switchgrass/Wildrye Savannah

The reference plant community of this site is a savannah. Cottonwood, elm, water oak, ash, pecan, black willow (*Salix nigra*), and sycamore (Plantanus occidentalis) trees provide about 30 percent canopy cover. The overstory canopy is denser immediately adjacent to the watercourse. The understory includes greenbrier (Smilax spp.), grape (Vitis spp.), and honeysuckle (Symphorcarpos spp.). Switchgrass, Indiangrass (*Sorghastrum nutans*), beaked panicum (*Panicum anceps*), little bluestem, and big bluestem dominate the herbaceous plant community. Continuous-yearlong abusive grazing for a succession of years will tend to move the herbaceous plant community towards a herbaceous community of midgrasses, shortgrasses, and eventually only forbs.

State 2
Shrubland

Dominant plant species

- elm (*Ulmus*), tree
- willow (*Salix*), shrub
- Indian woodoats (*Chasmanthium latifolium*), grass
- sedge (*Carex*), grass

Community 2.1
Shrubland

This plant community is a transitional community between the Savannah State and the Woodland State. It develops in the absence of proper grazing management and brush control treatments, mechanical or chemical. It is usually the result of abandonment following yearly continuous grazing. Trees and shrubs begin to replace the herbaceous component of the Savannah State. Species whose seeds are windblown or animal dispersed are the first to colonize and dominate. Remnants of switchgrass and wildrye may still occur but the herbaceous component of the community becomes dominated by grasses and forbs such. Shade-tolerant species such as Indian woodoats (*Chasmanthium latifolium*), longleaf woodoats (*Chasmanthium sessiliflorum*), sedges (Carex spp.), ironweed (Veronia spp.), and goldenrod (Solidago spp.) become the most abundant species as canopy cover increases. If the

woody shrub canopy has not exceeded 50 percent, prescribed burning on 3 to 5-year intervals in conjunction with prescribed grazing is a viable option for returning this community to a savannah that may resemble the reference community. If the woody canopy exceeds 50 percent, chemical or mechanical brush control must be applied to move this transitional community back towards the savannah state.

State 3
Woodland

Dominant plant species

- cottonwood (*Populus*), tree
- elm (*Ulmus*), tree
- oak (*Quercus*), tree

Community 3.1
Woodland

This plant community is a closed overstory (50 to 80 percent canopy) woodland dominated by cottonwood, elm, water oak, sycamore, and black willow. Understory shrubs and vines include greenbriar, grape (Vitis spp.), and yaupon (*Ilex vomitoria*). A herbaceous understory is almost nonexistent, but shade tolerant species including Indian woodoats, longleaf woodoats, sedges, ironweed, and goldenrod may occur in small amounts. Prescribed fire may be a viable treatment option for conversion of this site back to a semblance of the Switchgrass/Wildrye savannah Community during drought years. Chemical brush control on a large scale is not a treatment option; however, individual plant treatment with herbicides on small acreages may be. Mechanical treatment of this site, along with seeding, is the most viable treatment option, although probably not economical.

Transition T1A
State 1 to 2

The driver for this transition is abandonment, lack of fire, and/or lack of prescribed grazing. Woody species are allowed to continue to grow until reaching over the threshold of 30 percent. This signifies the transition to the Shrubland State.

Restoration pathway R2A
State 2 to 1

Prescribed grazing, periodic fire, and brush management are practices that will restore the site back to the reference state. The key to successful restoration is controlling the growth of woody species throughout the site.

Transition T2A
State 2 to 3

The driver for the transition to the Woodland State is further abandonment, lack of fire, and lack of prescribed grazing. The woody species have grown to a canopy cover greater than 50 percent, which signifies this transition.

Restoration pathway R3A
State 3 to 1

The driver for restoration from the Woodland State to the Savannah State is the management of woody species. Extensive brush management is required to open up the overstory canopy and allow for more herbaceous growth.

Additional community tables

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.

Inventory data references

This site description was developed as part of the provisional ecological site initiative using historic soil survey manuscripts, available range site descriptions, and low intensity field sampling.

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Approval

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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	05/13/2025
Approved by	Bryan Christensen
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):**

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

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:

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

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

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

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:**
