

Ecological site F152BY009TX

Sandy Terrace

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General information

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

MLRA notes

Major Land Resource Area (MLRA): 152B–Western Gulf Coast Flatwoods

Major Land Resource Area (MLRA) 152B, Western Gulf Coast Flatwoods, is in eastern Texas and western Louisiana. Locally termed the Flatwoods, the area is dominated by coniferous forest covering 5,681 square miles (14,714 square kilometers). The region is a hugely diverse transition zone between the northern and eastern mixed forests and southern and western coastal prairies and grasslands.

Classification relationships

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

Ecological site concept

The Sandy Terrace ecological site has deep sandy soils greater than 80 inches (203 centimeters) with little horizon development. The upland landscape, coupled with properties associated with the depth of the sand, forms its unique plant community.

Associated sites

F152BY008TX	Acid Baygall Soils have a spodic horizon and are extremely acid. Sites are not open and have dense thickets of large gallberry.
F152BY010TX	Terrace Soils have an increase in clay causing more water availability to plants. Sites have higher plant productivity potentials.

Similar sites

F152BY010TX	Terrace Soils have an increase in clay, causing more water availability to plants. Sites have higher plant productivity potentials.
F152BY012TX	Well Drained Bottomland Soils are on a lower landscape position and flood frequently.

F152BY006TX	Well Drained Loamy Upland Soils have an increase in clay, causing more water availability to plants. Sites have higher plant productivity potentials, typically with higher canopy covers, higher basal areas, and more robust herbaceous plant communities.
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Table 1. Dominant plant species

Tree	(1) <i>Pinus palustris</i> (2) <i>Quercus incana</i>
Shrub	Not specified
Herbaceous	(1) <i>Schizachyrium scoparium</i> (2) <i>Cnidoscolus texanus</i>

Physiographic features

The ecological site includes areas on nearly level to gently sloping soils on terraces and uplands. Slopes range from 0 to 5 percent. Elevation ranges from 25 to 151 feet. The topography of the area includes terraces.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Terrace
Runoff class	Negligible
Flooding frequency	None
Ponding frequency	None
Elevation	10 – 50 m
Slope	0 – 10 %
Aspect	Aspect is not a significant factor

Climatic features

The Western Gulf Coast Flatwoods (MLRA 152B) is within the humid subtropical climate zone. The region boasts one of the highest rainfall averages in the southern United States, over 60 inches (152 centimeters) annually. This is due to the gulf currents that carry humid air to the region, where it condenses and precipitates. Rainfall averages are fairly consistent month by month, ranging from the lowest of 3.5 inches (8.9 centimeters) in March and the highest of 5.6 inches (14.3 centimeters) in June.

The area is prone to severe thunderstorms and tornadoes when the proper conditions exist, generally in the springtime. Sometimes excessive rainfall occurs, leading to flooding. Hurricanes also strike the region, generally in late summer or early fall. These extreme weather events can be quite destructive, toppling trees, and serves to naturally reset the vegetation to primary succession. The higher humidity of the region amplifies the feeling of heat during the summer. Prolonged droughts and snowfall events are rare.

Table 3 Representative climatic features

Frost-free period (average)	250 days
Freeze-free period (average)	290 days
Precipitation total (average)	1,600 mm

- (1) CLEVELAND [USC00411810], Cleveland, TX
- (2) LIBERTY [USC00415196], Liberty, TX
- (3) LUMBERTON [USC00415435], Silsbee, TX
- (4) TOWN BLUFF DAM [USC00419101], Jasper, TX
- (5) DE QUINCY [USC00162361], Dequincy, LA
- (6) ELIZABETH [USC00162800], Oakdale, LA
- (7) WILDWOOD [USC00419754], Kountze, TX
- (8) OBERLIN FIRE TWR [USC00166938], Oberlin, LA
- (9) ORANGE 9 N [USC00416680], Orange, TX
- (10) DE RIDDER [USC00162367], Deridder, LA

Influencing water features

The soils are comprised of deep sands and are very permeable. Water drains through quickly and therefore does not have an influence on the site. Rather, lack of water is the most influential.

Wetland description

The soils associated with this site are non-hydric. Some sites have small areas that are hydric. These areas are typically in depressions or low lying flats that remain wet for long periods. Onsite investigation is needed to make an accurate determination on the local conditions.

Soil features

The soils of this site are deep and characterized by sands throughout the entire soil profile, measured to 80 inches (203 centimeters). The soils show little soil development indicative of the entisols soil order. These soils have a thin surface horizon that has the most organic carbon. The subsequent subsoil layers have little organic carbon and are mostly distinguished by color changes. Sand content is generally greater than 90 percent unweatherable minerals; clay and silt content ranges from 5 to 10 percent. The Turkey series is a representative soil and consists of very deep, somewhat excessively drained, moderately rapid permeable soils that formed in sandy deposits from the Deweyville Formation. The series is classified as a Thermic, coated Typic Quartzipsamment. Other soils are included within the ecological site and all are defined by deep sands throughout all horizons. Besides the Turkey series, the Alaga series and the McNeely series are included in the Sandy Terrace ecological site.

Table 4. Representative soil features

Parent material	(1) Alluvium – igneous, metamorphic and sedimentary rock
Surface texture	(1) Fine sand
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained

Permeability class	Moderately rapid to rapid
Soil depth	200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-152.4cm)	5.08 – 10.16 cm
Calcium carbonate equivalent (0-152.4cm)	Not specified
Electrical conductivity (0-152.4cm)	Not specified
Sodium adsorption ratio (0-152.4cm)	Not specified
Soil reaction (1:1 water) (0-152.4cm)	3.5 – 10
Subsurface fragment volume <=3" (Depth not specified)	Not specified
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

The information in this ecological site description (ESD), including the state-and-transition model (STM), was developed using archeological and historical data, professional experience, and scientific studies. The information is representative of a complex set of plant communities. Not all scenarios or plants are included. Key indicator plants, animals, and ecological processes are described to inform land management decisions.

Introduction – In southeastern Texas and southwestern Louisiana the transition from coastal grasslands to the large expanse of coniferous forest has been deemed the “Flatwoods”. As the name suggests, the region is relatively flat and, with many transitional areas, highly diverse in flora and fauna. Historically, the area was covered by pines with mixed hardwoods, sparse shrubs, and a diverse understory of grasses and forbs. Fire and drainage patterns play a significant role in shaping the plant communities and their development. Fire suppression, drainage alterations, and land conversion have reduced the amount of historical communities in

existence today.

Background – Prior to settlement by the Europeans, the reference state for the Sandy Terraces were Longleaf Pine/Bluejack Oak Woodlands. Remnants of this presumed historic plant community still exist where natural conditions are intact. Evidence of the reference state is found in accounts of early historic explorers to the area, historic forest and biological survey teams, as well as recent ecological studies in the last 30 years. The age of this woodland community varies, and has a diverse flora.

Settlement Management – As human settlement increased throughout the area, so did the increase in logging and grazing by domestic livestock. The logging became so extensive that by the 1930's most of the region had been cut-over. Replanting trees to historic communities was not common and early foresters began planting loblolly pine (*Pinus taeda*) for its quick growth. As more people colonized they began suppressing fire, which allowed dense thickets of shrubs to replace the herbaceous understory.

Current Management and State – Today much of the historic forest is gone, replaced by pine plantations, crops, and pastures. The areas that were not converted have been fire-suppressed so long that loblolly pine and fire intolerant hardwoods populate the overstory structure. Currently, federally-managed properties are the best place to view the remnant sites (National Park Service, U.S. Fish and Wildlife Service, etc.). Some private individuals have begun restoring communities through selective tree planting and retention of communities that remain. Other restoration efforts include mimicking natural-disturbance regimes through gap-phase regeneration on plantation sites.

Fire Regimes – Fire was a natural and important disturbance throughout the region. Fire occurred naturally from lightning strikes, by Native Americans for game movement, and eventually early European settlers. Fires throughout the Flatwoods occurred at two different times. Early in the year, they would occur during late winter and early spring, removing senescent vegetation, recycling nutrients and minerals, and spurring new plant growth. Late summer and early fall fires occurred as well, but with a different community effect. Summer fires burned hotter and with more intensity, greatly suppressing the shrub canopy layer. The summer fires also shifted the ecological site transitional state by decreasing grass densities and increasing forb densities. The topography, fuel loads, and other conditions caused patchy burns throughout the region resulting in mosaic patterns of plant communities and a heterogeneous landscape.

Disturbance Regimes – Extreme weather events occur occasionally throughout the region. Tornados uproot trees and open canopies in the spring months. In the late summer and early fall, hurricanes or tropical depressions can make landfall, dumping excessive amounts of rain and toppling trees with high winds. Another cause of large canopy openings is the effects of the southern pine beetle (*Dendroctonus frontalis*). Starting in the late 1950's, beetle outbreaks have occurred every 6 to 9 years (although a major attack has not occurred in some time); usually when the trees are stressed due to multiple environmental factors.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 6. Community 1.1 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height M	Canopy Cover (%)	Diameter Cm	Basal Area (square M/hectare)
Tree							
longleaf pine	PIPA2	<i>Pinus palustris</i>	Native	–	–	–	–
bluejack oak	QUIN	<i>Quercus incana</i>	Native	–	–	–	–
blackjack oak	QUMA3	<i>Quercus marilandica</i>	Native	–	–	–	–
post oak	QUST	<i>Quercus stellata</i>	Native	–	–	–	–

Table 7. Community 1.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (m)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
little bluestem	SCSC	<i>Schizachyrium scoparium</i>	Native	–	–
silver bluestem	BOSA	<i>Bothriochloa saccharoides</i>	Native	–	–
threeawn	ARIST	<i>Aristida</i>	Native	–	–
lovegrass	ERAGR	<i>Eragrostis</i>	Native	–	–
rosette grass	DICHA2	<i>Dichantheium</i>	Native	–	–
Forb/Herb					
noseburn	TRAGI	<i>Tragia</i>	Native	–	–

Texas bullnettle	CNTE	<i>Cnidoscopus texanus</i>	Native	–	–
soft greeneyes	BEPU2	<i>Berlandiera pumila</i>	Native	–	–
hairy bedstraw	GAPI2	<i>Galium pilosum</i>	Native	–	–
queen's-delight	STSY	<i>Stillingia sylvatica</i>	Native	–	–
Fern/fern ally					
western brackenfern	PTAQ	<i>Pteridium aquilinum</i>	Native	–	–
Shrub/Subshrub					
farkleberry	VAAR	<i>Vaccinium arboreum</i>	Native	–	–
feltleaf willow	SAAL	<i>Salix alaxensis</i>	Native	–	–
Gulf Coast yucca	YULO	<i>Yucca louisianensis</i>	Native	–	–
Tree					
longleaf pine	PIPA2	<i>Pinus palustris</i>	Native	–	–
bluejack oak	QUIN	<i>Quercus incana</i>	Native	–	–
blackjack oak	QUMA3	<i>Quercus marilandica</i>	Native	–	–
post oak	QUST	<i>Quercus stellata</i>	Native	–	–
Vine/Liana					
cat greenbrier	SMGL	<i>Smilax glauca</i>	Native	–	–
southern dewberry	RUTR	<i>Rubus trivialis</i>	Native	–	–

Table 8. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 4.1 plant community composition

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

These soils occur in the Woodland Suitability Group 3s3. These sandy soils are on uplands and have a moderate potential for pine management. The 50-year site index for loblolly pine averages 85 feet (57 feet on a 25-year curve) but ranges from 80 feet to 95 feet, depending on slope position. The yield from a natural, unmanaged stand of loblolly pine, over a 50-year period, is approximately 280 board feet (Doyle Rule), 2.24 tons, or 80 cubic feet per acre per year. Management can substantially increase this yield. Because these soils are loose when dry, access and equipment operability is poor during such periods when rutting is possible. They are well suited for access and equipment operability during wet periods. These soils are also well suited for roads and log landings but can have erosion problems as slopes increase. Adequate water control devices for roads, such as wing ditches and water bars, should be installed on the steeper slopes. Seedling mortality may be slight to moderate. Proper planting depth and compaction will be important. Herbaceous weed control may be needed. Attention should be given to the possible leaching of fertilizers and of chemicals when herbicides are used for site preparation. Choose appropriate chemicals and application methods to prevent the possible contamination of ground water.

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.

Type locality

Location 1: Hardin County, TX	
UTM zone	N

UTM northing	30.349484
UTM easting	-94.236016
General legal description	Roy E. Larsen Sandylands Sanctuary

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Contributors

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Approval

Bryan Christensen, 9/22/2023

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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	09/21/2021
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):

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:

17. Perennial plant reproductive capability:
