Ecological site F133BY012TX
Wet Terrace

Last updated: 9/21/2023
Accessed: 05/13/2025

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.
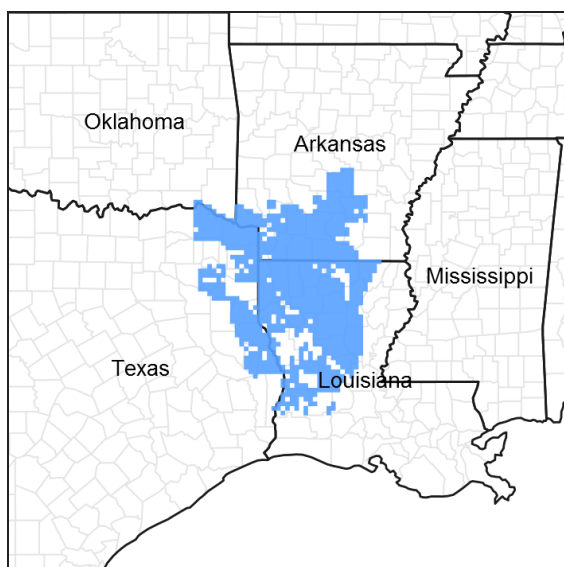

Figure 1. Mapped extent

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): 133B–Western Coastal Plain

Major Land Resource Area (MLRA) 133B, Western Coastal Plain is in eastern Texas, western Louisiana, and the southwest corner of Arkansas. The area is dominated by coniferous forest covering 45,450 square miles (29,088,000 acres). The region is a hugely diverse transition zone between the eastern deciduous forests and the central grasslands to the west.

Classification relationships

USDA-Natural Resources Conservation Service, 2006.
-Major Land Resource Area (MLRA) 133B

Ecological site concept

The Wet Terrace site has very deep soils on terrace landforms. They are positioned higher than bottomlands and lower that uplands. This landscape position coupled with their slowly permeable, poorly drained soils form their unique plant community.

Associated sites

F133BY017TX	**Loamy Bottomland** Sites are on a lower bottom landscape and flood regularly.
F133BY018TX	**Clayey Bottomland** Sites are on a lower bottom landscape and flood regularly.
F133BY001TX	**Depression** Sites are located in depressions of uplands and terraces. Sites are typically wetter and are ponded for portions of the year.
F133BY002TX	**Seasonally Wet Upland** Sites are on a higher landscape on the uplands.
F133BY003TX	**Loamy Over Clayey Upland** Sites are on uplands and have clay textures throughout their horizons.
F133BY004TX	**Loamy Claypan Upland** Sites are on uplands and have an abrupt textural change from loam to clay. Sites are sometime shallow to bedrock.
F133BY005TX	**Loamy Upland** Sites are on uplands and have loamy textured soil throughout their profile.
F133BY011TX	**Deep Sandy Terrace** Sites are on a similar landscape position by are characterized by deep sands with rapid drainage.
F133BY013TX	**Terrace** Sites are on a similar terrace position but have more developed drainage patterns. Sites are not as wet.
F133BY014TX	**Creek Bottomland** Sites are located in a bottomland position and flood regularly.
F133BY015TX	**Swamp** Sites are on the lowest part of the landscape and are semi-permanently ponded.
F133BY016TX	**Sandy Bottomland** Sites are on a lower bottom landscape and flood regularly.

Similar sites

F133BY001TX	**Depression** Sites are located on depression of uplands and terraces. Sites are ponded for portions of the year and have wetter associated plants.
F133BY002TX	**Seasonally Wet Upland** Sites are on a higher upland landscape.

Table 1. Dominant plant species

Tree	(1) *Quercus nigra* (2) *Pinus taeda*
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This ecological site is found on terraces. Slopes range from 0 to 5 percent. Runoff is low to negligible. Flooding can occur, but the soils exhibit a high water table. The water table depth ranges from 6 to 36 inches mainly between November to May. It is deeper during the warmer months of the year.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Terrace
Runoff class	Negligible to low

Flooding duration	Extremely brief (0.1 to 4 hours)
Flooding frequency	None to rare
Ponding frequency	None
Elevation	30–305 m
Slope	0–5%
Water table depth	15–91 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate of the Western Coastal Plain (MLRA 133B) is humid subtropical with hot summers and mild winters. Canadian air masses that move southward across Texas and Louisiana over the Gulf of Mexico in winter produce cool, cloudy, rainy weather with only rare cold waves that moderate in one or two days. Precipitation is distributed fairly even throughout the year and is most often in the form of slow and gentle rains.

Spring weather can be variable. March is relatively dry while thunderstorm activities increase in April and May. Occasional slow-moving thunderstorms or other weather disturbances may dump excessive amounts of precipitation on the area. Fall has moderate temperatures. Fall experiences an increase of precipitation and frequently has periods of mild, dry, sunny weather. Heavy rain may occur early in the fall because of tropical disturbances, which move westward from the gulf. Tropical storms are a threat to the area in the summer and fall but severe storms are rare. Prolonged droughts and snowfall are rare.

The total annual precipitation ranges from 39 inches in the western part of the region to 60 inches in the eastern part of the region. Approximately 50 percent of the rainfall occurs between April and September, which includes the growing season for most crops. Thunderstorms occur on about 50 days each year and most occur during the summer.

The average relative humidity in mid-afternoon is about 60 percent. Humidity is higher at night and the average at dawn is about 90 percent. The sun shines 70 percent of the time in summer and 50 percent in winter. The prevailing wind is from the south-southeast. Average wind-speed is highest at 11 miles per hour in spring.

Table 3. Representative climatic features

Frost-free period (average)	219 days
Freeze-free period (average)	252 days
Precipitation total (average)	1,397 mm

Climate stations used

- (1) RUSK [USC00417841], Rusk, TX
- (2) TOLEDO BEND DAM [USC00419068], Anacoco, TX
- (3) JENA 4 WSW [USC00164696], Trout, LA
- (4) CALION L&D [USC00031140], El Dorado, AR
- (5) DEKALB [USC00412352], Simms, TX
- (6) GILMER 4 WNW [USC00413546], Gilmer, TX
- (7) MAGNOLIA [USC00034548], Magnolia, AR
- (8) SHERIDAN [USC00036562], Sheridan, AR
- (9) MINDEN [USC00166244], Minden, LA
- (10) CALHOUN RSCH STN [USC00161411], Calhoun, LA
- (11) CARTHAGE [USC00411500], Carthage, TX
- (12) HUNTSVILLE [USC00414382], Huntsville, TX

Influencing water features

This ecological site is influenced by a high water table from 6 to 36 inches, usually from November to May.

Wetland description

Many of the soils correlated to the site are classified as hydric. Onsite field determinations using water, soil, and plant indicators should be used to verify if the sites are classified as wetlands.

Soil features

The ecological site consist of very deep, poorly drained, moderately slow to very slowly permeable soils formed in silty and clayey alluvium.

Soils correlated to this ecological site include: Amagon, Bodcau, Brimstone, Crowley, Dorcheat, Dubach, Falkner, Frizzell, Gessner, Gurdon, Guyton, Haggerty, Hatchie, Kildare, Lewiston, Mollicy, Myatt, Pheba, Smithton, Thage, Vick, Weston, Wrightsville, and Zenoria.

Table 4. Representative soil features

Parent material	(1) Alluvium–mudstone (2) Alluvium–siltstone
Surface texture	(1) Silt loam (2) Fine sandy loam (3) Loam
Family particle size	(1) Clayey
Drainage class	Somewhat poorly drained to very poorly drained
Permeability class	Moderately slow to very slow
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	10.16–27.94 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	3.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–4%
Subsurface fragment volume >3" (Depth not specified)	0%

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 – Southern Arkansas, western Louisiana, and eastern Texas have been deemed the Pineywoods because of the vast expanse of pine trees. The region represents the western edge of the southern coniferous belt.

Historically, the area was covered by pines with mixed hardwoods, sparse shrubs, and a diverse understory of grasses and forbs. Fire played a significant role in reducing the woody competition that generally out-competes the herbaceous understory layer. Fire suppression 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 Terrace ecological site was a Water Oak/Loblolly Pine (*Quercus nigra*/*Pinus taeda*) Forest. Remnants of this presumed historic plant community still exist where natural conditions are replicated through conservation management techniques. 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 understory of grasses and forbs.

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.
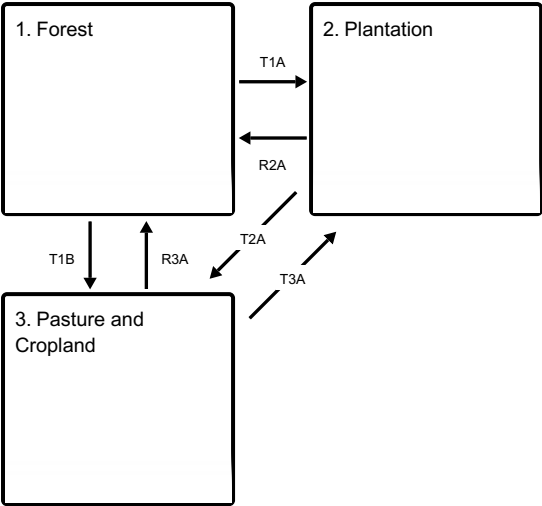
Current Management and State – Today much of the remnant forest is gone, replaced by pine plantations, crops, and pastures. The areas that were not converted have been fire-suppressed so long that loblolly pine and fire intolerant hardwoods populate the overstory structure. Currently, U.S. Forest Service properties are the best place to view the remnant sites. 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 Western Gulf Plain. Fire occurred naturally from lightning strikes and by Native Americans for game movement. The reference community developed with a frequency of fire every 10 to 20 years. Fires usually occurred in early spring, removing senescent vegetation, recycling nutrients and minerals, and spurring new plant growth. Late summer 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 often 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.
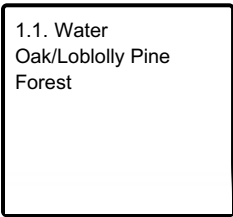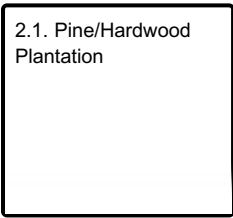
State and transition model

Ecosystem states

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┌─────────────────┐         ┌─────────────────┐
│ 1. Forest       │  T1A    │ 2. Plantation   │
│                 │ ──────> │                 │
│                 │ <────── │                 │
│                 │  R2A    │                 │
└─────────────────┘         └─────────────────┘
     │    ▲              T2A ↘  ↗ T3A
 T1B │    │ R3A              ↙
     ▼    │
┌─────────────────┐
│ 3. Pasture and  │
│ Cropland        │
│                 │
│                 │
└─────────────────┘
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T1A - Clearcut, site preparation, tree planting

T1B - Clearcut, grass/crop planting

R2A - Gap-phase regeneration or clearcut with tree planting

T2A - Clearcut, grass/crop planting

R3A - Tree planting, mature overstory establishment
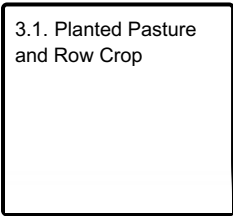
T3A - Clearcut, site preparation, tree planting

State 1 submodel, plant communities

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┌─────────────────┐
│ 1.1. Water      │
│ Oak/Loblolly Pine│
│ Forest          │
│                 │
│                 │
│                 │
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State 2 submodel, plant communities

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┌─────────────────┐
│ 2.1. Pine/Hardwood│
│ Plantation      │
│                 │
│                 │
│                 │
└─────────────────┘
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State 3 submodel, plant communities

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┌─────────────────┐
│ 3.1. Planted Pasture│
│ and Row Crop    │
│                 │
│                 │
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└─────────────────┘
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State 1
Forest

State 1 has an overstory of water oak, loblolly pine, and sweetgum (liquidambar styraciflua). Other overstory species may include white oak (*Quercus alba*), laurel oak (*Quercus laurifolia*), green ash (*Fraxinus pennsylvanica*), blackgum (*Nyssa sylvatica*), and southern red oak (*Quercus falcata*). The shrub layer can become dominate and sometimes forms dense thickets. Species growing on these sites are adapted to the high water table and the rare flooding. Natural disturbances of fires, lightning strikes, hurricanes (wind throw), ice events (rare), and beetle infestations aid in maintaining the uneven-age structure. The natural canopy spacing is kept intact by the natural

droughtiness and periodic fires ranging from 10 to 20 years. Fire is not as an extremely important factor until the sites become really dry and experience burning from the adjacent uplands and terraces. Instead, treefall from soil saturation is the most common disturbance.

Community 1.1
Water Oak/Loblolly Pine Forest

Dense shrub layers can be common on the Wet Terraces. Species of flowering dogwood (*Cornus florida*), green ash, American hornbeam (*Carpinus caroliniana*), American beautyberry (Callicarpa Americana), winged elm (*Ulmus alata*), American holly (*Ilex opaca*), and rusty blackhaw (*Viburnum rufidulum*). A wide variety of grasses and forbs may be common if the overstory and shrub layer are not restricting light to the understory. Longleaf woodoats (*Chasmanthium sessiliflorum*), hairy bedstraw (*Galium pilosum*), greenbriers (Smilax sp.), various sedges (Carex sp.), and rushes (Juncus sp.)

State 2
Plantation

The Plantation State is a result of conversion activities. The landowner has maximized silviculture production by planting a monoculture of tree species.

Community 2.1
Pine/Hardwood Plantation

In the immediate years following the initial plantation tree planting, the understory community will resemble the State 1. During this early growth period, the landowner will typically remove unwanted hardwoods and herbaceous plants to reduce competition with the planted pine trees. As the overstory canopy closes, less understory management is required due to sunlight restrictions to the ground layer.

State 3
Pasture and Cropland

The Pasture and Cropland State is a result of conversion activities. The landowner has maximized agriculture production by planting a monoculture of introduced grass species or agricultural row crops.

Community 3.1
Planted Pasture and Row Crop

Typical introduced pasture grass species include bahiagrass (*Paspalum notatum*) and different varieties of bermudagrass (*Cynodon dactylon*). The grasses are grown for livestock production through direct grazing or baling hay for later use. Agricultural row crops are grown for food and fiber production. Many farmers use herbicides to reduce unwanted plant competition which yields a plant community unrepresentative of State 1 or subsequent vegetative states.

Transition T1A
State 1 to 2

The transition is due to the land manager maximizing silviculture potential. Merchantable timber is harvested by clearcut, then the site is prepared and planted to a monoculture of trees.

Transition T1B
State 1 to 3

The transition is due to the land manager maximizing agricultural production. Merchantable timber is harvested by clearcut, then the site is prepared and planted to either an improved grass or row crops.

Restoration pathway R2A
State 2 to 1

When restoring a plantation, the land manager can either clearcut the timber, prepare the site, and plant trees. Otherwise, gap-phase regeneration is possible through selective timber harvests. This involves replanting the desired overstory species in small openings within the current structure of the forest. The benefit is a slow progression of restoration instead of starting from primary succession.

Transition T2A
State 2 to 3

The transition is due to the land manager maximizing agricultural production. Merchantable timber is harvested by clearcut, then the site prepared and planted to either an improved grass or row crops.

Restoration pathway R3A
State 3 to 1

This restoration path can be accomplished by planting a mix of native species to their natural frequencies trying to attain a mature overstory canopy. Management will be required to control unwanted species by burning, mowing, and/or herbicides. Controlling introduced pasture grasses is difficult, with complete control likely not attainable. The herbaceous understory will take time to develop, but this process can be expedited if adapted plant material is available.

Transition T3A
State 3 to 2

The transition is due to the land manager maximizing silviculture production. The site is prepared and planted to a monoculture of pine or hardwood trees.

Additional community tables

Inventory data references

These site descriptions were developed as part a Provisional Ecological Site project using historic soil survey manuscripts, available site descriptions, and low intensity field traverse sampling. Future work to validate the information is needed. This will include field activities to collect low, medium, and high-intensity sampling, soil correlations, and analysis of that data. A final field review, peer review, quality control, and quality assurance review of the will be needed to produce the final document.

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Contributors

Tyson Hart

Approval

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	09/03/2021
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:**

17. **Perennial plant reproductive capability:**