

**Field Key to Ecological Systems of Map Zones 37, 45, 46, 98 and 99  
Gulf Coastal Plains, Mississippi River Alluvial Plain and  
Adjacent Areas, United States**

**NatureServe  
Terrestrial Ecology Department  
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Temple-Inland Properties, East Texas 2003. Photo by Rob Evans.



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## Introduction

The following keys to NatureServe ecological systems cover the areas found in NLCD map zones 37, 45, 46, 98 and 99. This area includes parts of these EPA Level III Ecoregions: Southern Coastal Plain, Southeastern Plains, Mississippi Valley Loess Plains, Mississippi Alluvial Plain, South Central Plains, Western Gulf Coastal Plain, East-Central Texas Plains, and a small part of the Texas Blackland Prairies. These units as well as the EPA Level IV Ecoregions are referred to in the key. The systems included in these keys are intended to represent the legend that LANDFIRE will be striving to map for existing vegetation (Figure 1). Some types are in the keys that characteristically occur at small spatial scales (generally <2 ha in size) and hence may not be mappable by the LANDFIRE project. However, we have chosen to be inclusive in the keys, so that the user will have information on these system types for comparison purposes. In some cases they may be important for modeling fire condition class and, given their relative distinctiveness on the landscape, they may indeed be mappable.

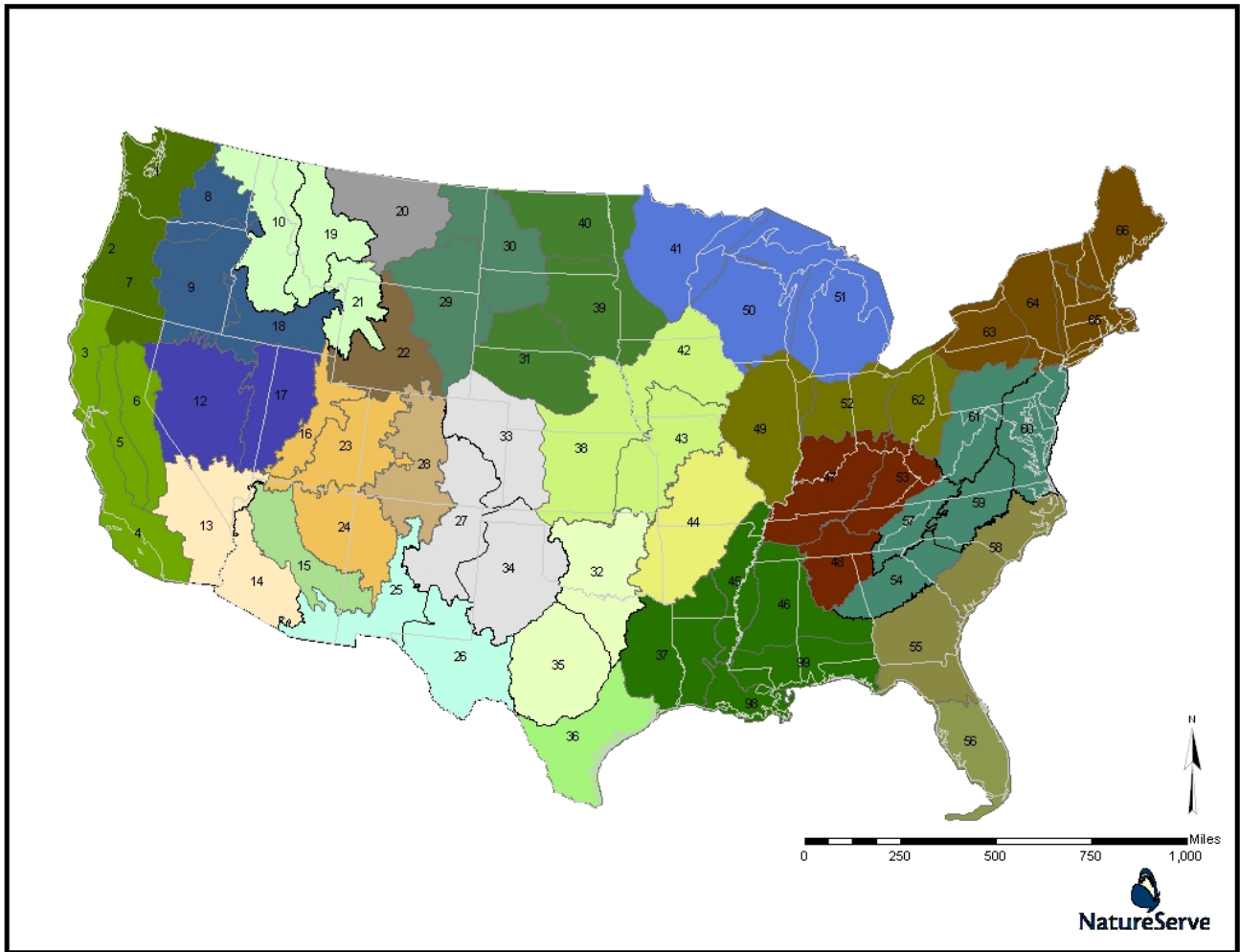
Plant names are almost always in Latin and follow the nomenclature of Kartesz (1999). In limited cases, we have included synonyms and/or common names for some taxa.

The keys are “dichotomous”, which means the user follows the order of the ‘couplets’ and makes a choice between the 2 options represented in the couplet. The ordering of the couplets in each key does matter, and the user should choose the option in each couplet that best fits the data or field situation. The users should carefully read both couplets before making the best choice of the two available leads. A choice leads the user to the next couplet to be utilized in the keying process, via a number at the far right, or else leads to a final result (an ecological system type or an alliance).

If the choice the user makes leads to a “result”, then either an Ecological System or a Vegetation Alliance is named. Alliances are recognizable because “alliance” is in the name, and they all start with one or more Latin names (e.g. *Pinus taeda* Forest Alliance).

Systems do not include Latin species names in them, and always start with a Biogeographic region (e.g. Southern Coastal Plain or Atlantic Coastal Plain), and may include plant species or genus common names (e.g. Pine, Oak). Numbers in parentheses placed after the System Name are the EVT (Existing Vegetation Type) codes assigned by Landfire to the Systems.

Some keys or portions of keys may follow a different logic from one another, depending on what ecological or biogeographic variable is best suited to the types included in the key. A group of higher-order couplets or choices guides the user to one of several individual keys for a more specific group of systems. Some systems include a variety of manifestations on the landscape, and these may appear more than once in the key or keys. These examples will be noted by reference to the other examples.



**Figure 1. LANDFIRE map zone clusters with keys to ecological systems and selected alliances.**

The keys to ecological systems use a variety of different variables, which are applied in various sequences, depending on the relative significance of the variable. Variables that are less ambiguous in their application will ideally be used earlier or “higher” in the key. The principal (and more-or-less “universal”) variables that help provide the upper structure for the key include broad physiognomy (e.g. forested vs. non-forested), broad biogeography (where a map zone is heterogeneous in this respect), and general hydrology (e.g. upland and wetland). Common terms instead of overly jargonistic or technical language, is preferred in the key where possible, but some terms may require definition. In our sense of meaning, “wetland” vegetation is that which “whose composition is affected by flooding or saturated soil conditions.” The term is not used in the sense of a “jurisdictional wetland”, which is a more limited as well as a legal meaning of this term.

Systems may occur in the key in several places, if their range of variability would require this. In particular, there are issues of classification of examples or stands which are found on land on which Longleaf Pine (*Pinus palustris*) was historically dominant, but which are currently occupied by oaks or by a mix of Loblolly Pine (*Pinus taeda*) and oaks. In these cases, an accurate decision would require the user to discern the probability that the landscape would have supported a more frequent role for fire in the ecological dynamics of the site. In general, a flatter and more level site would have a higher probability of more frequent fire.

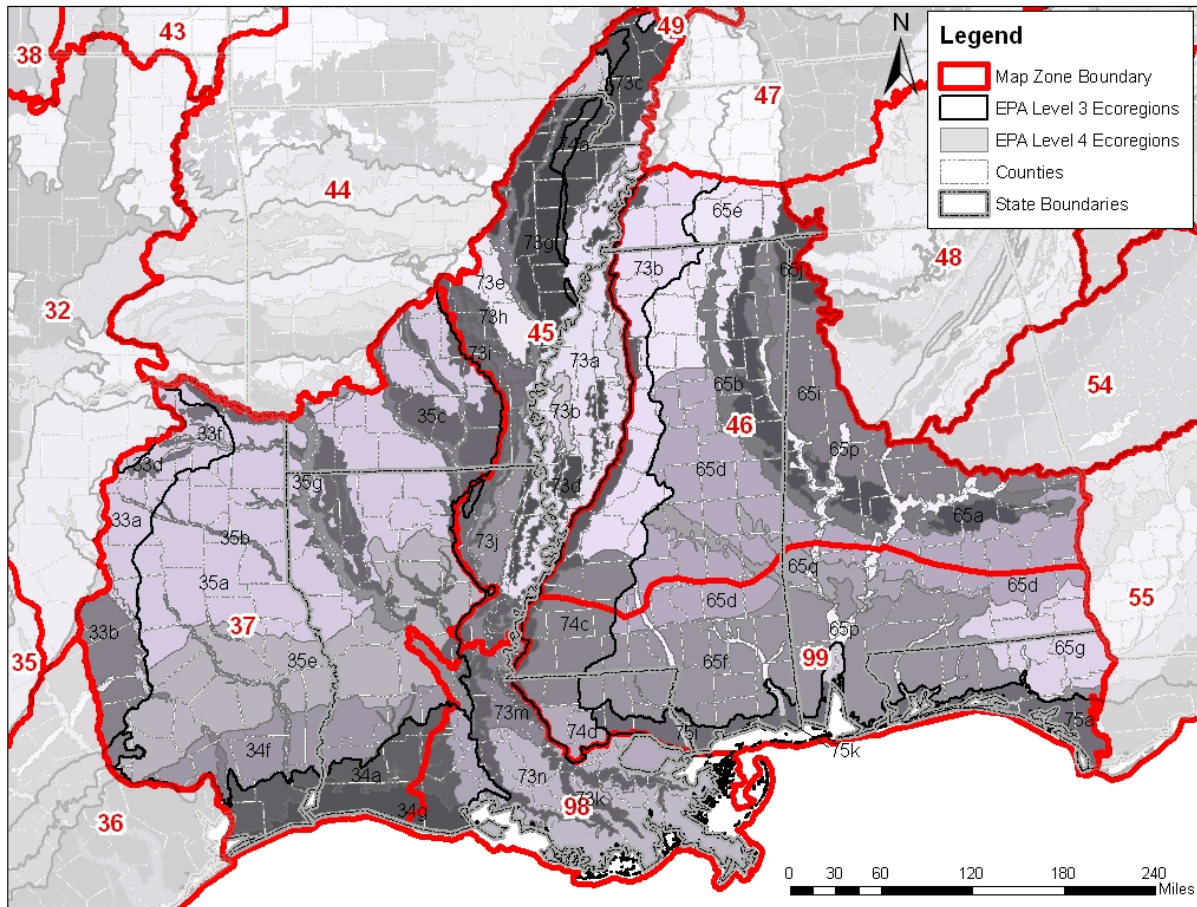
In more detailed (or “lower”) places in the key, dominance within vegetation strata may play a role. Tree cover is generally considered first, then that of shrubs, then the herbaceous component. Codominant species within a given strata are important as well, in some cases a system type or alliances will have 2 or more codominant species, which may or may not be present in all stands.

Some terminology is commonly employed throughout the keys that distinguish general spatial characteristics of the vegetation or environmental setting. For example ‘matrix’ types of vegetation are dominant across the majority of a given landscape, while ‘large patch’ types tend to occur as distinctive patches, which represent specific environments within the larger ‘matrix.’ In the southeastern coastal plains, elevation is not of much use in distinguishing systems, but soil composition or latitude may be of some importance. These variables and others are used to provide the framework for the key.

Ideally, the user of the key will be able to locate themselves in relation to the EPA Level IV Ecoregions, as in some cases this may be the determining factor between two otherwise similar systems. These ecoregional limits are in a sense a general guide, and different systems of classifying ecoregions vary in terms of precisely where these boundaries occur. In many cases, the ecoregional line correlates well with an observable variable in vegetation, topography, soil type, etc., but this may not always be the case and ecotonal areas may occur in some cases near a boundary. If difficulties arise, the first step to be taken would be to read the detailed description of the Ecological System(s) in question. These are available from <http://www.natureserve.org/explore>.

The Southern US Office of NatureServe has also developed range map shapefiles for most Ecological Systems that are being employed as Landfire target map units. These were developed with funding and support from, and in collaboration with, the USGS BDR Southeastern GAP Analysis Project. Please contact Milo Pyne ([milo\\_pyne@natureserve.org](mailto:milo_pyne@natureserve.org)) 919.484.7857 ext. 136 for more information.

Users of this key should also contact the Southern US Office of NatureServe (at the phone number and email given above) if any issues arise with the use and interpretation of the key presented here. It is the sincere hope of NatureServe that this key will be of use to field workers in the location and interpretation of examples of Ecological Systems. Any factual errors or other information contained herein that is incorrect or misleading is entirely our responsibility, and we would hope to correct or improve it in the future.



**Figure 2 – EPA Level III and Level IV Ecoregions for Map Zones 37, 45, 46, 98 and 99**

In the section of the document immediately following, we have provided a table showing the LANDFIRE legend units that represent non-natural vegetation and a short description for each of them. They are not formally incorporated into the keys, since they are typically recognizable without the use of a key, or else their floristic composition is so variable as to be not useful in a field key. Our primary purpose was to provide keys for the natural and near-natural vegetation of these zones.

## Land Use, Unvegetated, Semi-natural and Altered Vegetation

LAND USE OR UNVEGETATED SURFACES	
Open Water	Open water
Developed	Generally developed lands.
Developed, Open Space	Vegetation (primarily grasses) planted in developed settings for recreation, erosion control, or aesthetic purposes. Impervious surfaces account for less than 20% of total cover. Examples include parks, lawns, golf courses, airport grasses, and industrial site grasses.
Developed, Low Intensity	Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20-50% of total cover. These areas most commonly include single-family housing units.
Developed, Medium Intensity	Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50-80% of the total cover. These areas most commonly include single-family housing units

Developed, High Intensity	Includes highly developed areas where people reside in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to 100% of the total cover.
<b>Agriculture</b>	Generally developed for agricultural uses.
Pasture/Hay	These agriculture lands typically have perennial herbaceous cover (e.g. regularly-shaped plantings) used for livestock grazing or the production of hay. There are obvious signs of management such as irrigation and haying that distinguish it from natural grasslands. Identified CRP lands are included in this land cover type.
Cultivated Crops and Irrigated Agriculture	These areas used for the production of crops, such as corn, soybeans, small grains, sunflowers, vegetables, and cotton, typically on an annual cycle. Agricultural plant cover is variable depending on season and type of farming. Other areas include more stable land cover of orchards and vineyards.
<b>SEMI-NATURAL / ALTERED VEGETATION</b>	
<b>Ruderal Vegetation</b>	Vegetation resulting from succession following significant anthropogenic disturbance of an area. It is generally characterized by unnatural combinations of species (primarily native species, though they often contain slight or substantial numbers and amounts of species alien to the region as well)
Ruderal Upland - Old Field	
Ruderal Upland – Abandoned Tree Plantation	
Ruderal Wetland	
<b>Introduced Vegetation</b>	Vegetation dominated by introduced species. These are spontaneous, self-perpetuating, and not (immediately) the result of planting, cultivation, or human maintenance. Land occupied by introduced vegetation is generally permanently altered (converted) unless restoration efforts are undertaken.
Introduced Upland Vegetation – Treed	Land cover is significantly altered/disturbed by introduced tree species.
Introduced Upland Vegetation - Shrub	Land cover is significantly altered/disturbed by introduced woody and/or herbaceous vegetation.
Introduced Upland Vegetation – Annual and Biennial Forbland	Land cover is significantly altered/disturbed by introduced annual and biennial forbs. Natural vegetation types are no longer recognizable.
Introduced Upland Vegetation - Perennial Grassland and Forbland	Land cover is significantly altered/disturbed by introduced, non-native perennial grasses and forbs. Natural vegetation types are no longer recognizable.
Introduced Riparian Vegetation	Land cover is altered/disturbed and dominated by introduced woody vegetation (woodlands and shrublands). Typical riparian trees and shrubs include <i>Elaeagnus angustifolia</i> , <i>Triadica sebifera</i> , etc.
Introduced Wetland Vegetation	Land cover is altered/disturbed and dominated by introduced wetland vegetation. Species may include <i>Lythrum salicaria</i> , <i>Phalaris arundinacea</i> , <i>Phragmites australis</i> , etc.
<b>Modified/Managed Vegetation</b>	Vegetation resulting from management or modification of natural/near natural; vegetation, but producing a structural and floristic combination not clearly known to have a natural analogue. Modified vegetation may be easily restorable by either management, restoration of ecological processes, and/or succession.
Modified/Managed Upland Vegetation	Land cover is apparently managed/modified and dominated by trees and/or shrubs. Vegetation is a mixture of herbaceous, shrub, and tree species.
Recently Burned Forest and Woodland	Land cover is apparently modified by recent fires which have burned forest and woodland vegetation. Vegetation is a mixture of herbaceous, shrub, and tree species.
Recently Burned Shrubland	Land cover is apparently modified by recent fires which have shrubland vegetation. Vegetation is a mixture of herbaceous and shrub species.
Recently Burned Grassland	Land cover is apparently modified by recent fires which have burned grassland vegetation. Vegetation is a mixture of herbaceous and shrub species.
Managed Tree Plantation	Land cover is apparently modified and appears as a managed tree plantation.
Recently Logged Timberland	Land cover is apparently modified and appears as logged timberland.
Modified/Managed Wetland Vegetation	These areas include created and obviously managed wetlands of varying size resulting from water diversion. Artificial Wetlands will be mapped where obvious built structures may be distinguished from imagery.

# Map Zone 37, 45, 46, 98 and 99 Ecological Systems

This key is intended to aid in the identification of Ecological Systems and selected semi-natural or altered vegetation types that are found in the Gulf Coastal Plains, Mississippi River Alluvial Plain and Adjacent Areas (NLCD Map Zones 37, 45, 46, 98 and 99), which covers the Gulf and Atlantic Coastal Plains in west Florida, Mississippi, Alabama, Louisiana, east Texas and the southeastern half of Arkansas. Note that Texas-Louisiana Coastal Prairie (2434) was not included in the sequence table.

## KEY TO KEYS

- 1a. Gulf of Mexico beach with <10% total cover of vegetation, situated just above the mean high tide limit, generally including the outermost zone of coastal vegetation extending seaward from foredunes on barrier islands and also limited overwash flats behind breached foredunes. Substrates consist of unconsolidated sand and shell sediments that are constantly shifting ..... **Gulf and Atlantic Coastal Plain Sparsely Vegetated Systems (2498)**
- 1b. Site is not Gulf of Mexico beach, all other coastal and inland ecological systems key here, vegetation total cover >10% ..... **2**
- 2a. Site is located in the Mississippi Alluvial Plain Level III Ecoregion 73 (EPA), or on Crowley’s Ridge (the portion of EPA 74b W of the Mississippi River; Subsection 234Db in part (Cleland et al 2005)) ..... **KEY A: Ecological Systems of the Mississippi Alluvial Plain, Map Zones 45 & 98**
- 2b. Site is not located in the Mississippi River Alluvial Plain or on Crowley’s Ridge ..... **3**
- 3a. Site is located west of the Mississippi Alluvial Plain Level III Ecoregion 73 (EPA), in Arkansas, Louisiana or eastern Texas (i.e. in the Western Gulf Coastal Plain Level III Ecoregion 34, South Central Plains Level III Ecoregion 35, East Central Texas Plains Level III Ecoregion 33, or Texas Blackland Prairies Level III Ecoregion 32)..... **4**
- 3b. Site is located east of the Mississippi Alluvial Plain Level III Ecoregion 73 (EPA), in SW Tennessee, Alabama, W Florida, Mississippi, or the Florida Parishes of Louisiana (i.e. in the Mississippi Valley Loess Plains Level III Ecoregion 74, Southeastern Plains Level III Ecoregion 65 or Southern Coastal Plain Level III Ecoregion 75) ..... **6**
- 4a. Total woody canopy cover generally 10% or more, total cover of all vegetation also >10% ..... **5**
- 4b. Total woody canopy cover generally less than 10% ..... **KEY D: Herbaceous Ecological Systems of the South Central Plains, Western Gulf Coastal Plain or East-Central Texas Plains, Map Zone 37**
- 5a. Uplands (not riparian or influenced by flooding or saturation) ..... **KEY B: Upland Forest, Woodland, and Savanna Ecological Systems of the South Central Plains, Western Gulf Coastal Plain or East-Central Texas Plains, Map Zone 37**
- 5b. Wetlands (prone to flooding or saturation), riparian areas or flatwoods ..... **KEY C: Wetland Forest, Woodland, and Savanna Ecological Systems of the South Central Plains, Western Gulf Coastal Plain or East-Central Texas Plains, Map Zone 37**
- 6a. Total woody canopy cover generally 10% or more ..... **7**
- 6b. Total woody canopy cover generally less than 10% ..... **KEY G: Herbaceous Ecological Systems of the Southeastern Plains and Southern Coastal Plain, Map Zones 46 & 99**
- 7a. Uplands (not riparian or influenced by flooding or saturation) ..... **KEY E: Upland Forest, Woodland, and Savanna Ecological Systems of the Southeastern Plains and Southern Coastal Plain, Map Zones 46 & 99**
- 7b. Wetlands (prone to flooding or saturation), riparian areas or flatwoods ..... **KEY F: Wetland Forest, Woodland, and Savanna Ecological Systems of the Southeastern Plains and Southern Coastal Plain, Map Zones 46 & 99**

**KEY A: Ecological Systems of the Mississippi Alluvial Plain, Map Zones 45 & 98**

1a. Total woody canopy cover generally 10% or more, total cover of all vegetation also >10% ..... 5

1b. Total woody canopy cover generally less than 10% ..... 2

2a. Vegetation dominated by native plants, non-native perennial herbaceous plants or grasses having <20% relative cover ..... 4

2b. Vegetation with non-native perennial herbaceous plants or grasses having >20% relative cover ..... 3

3a. Vegetation with significant cover of non-native perennial herbaceous plants, riparian areas with moderate to high cover of invasive exotic plants, (i.e. >20% relative cover of *Ligustrum sinense*, *Lygodium japonicum*, *Paspalum urvillei*, or *Cyperus entrerianus*) ..... **Introduced Riparian Vegetation (2180)**

3b. Vegetation with non-native perennial herbaceous plants or grasses having >20% relative cover with any combination of these species: *Paspalum notatum*, *Imperata cylindrica*, *Cynodon dactylon*, *Sorghum halepense*, *Sporobolus indicus*, *Lespedeza cuneata*, *Eremochloa ophiuroides*, *Solanum viarum* ..... **Introduced Upland Vegetation - Perennial Grassland and Forbland (2182)**

4a. Grassland located in the Grand Prairie (Ecoregion 73e) in Arkansas between the Arkansas and White Rivers or on Macon Ridge (Ecoregion 73j) between the Boeuf River and Bayou Macon in Arkansas or Louisiana. Typical examples are dominated by *Panicum virgatum* and *Andropogon gerardii*. ..... **Lower Mississippi Alluvial Plain Grand Prairie (2432)**

4b. Fresh to saline, wind and lunar tidal marshes along the Gulf Coast..... **Gulf and Atlantic Coastal Plain Tidal Marsh Systems (2490)**

5a. Trees in planted stands generally with >70% relative cover of *Pinus palustris*, *Pinus elliottii*, or *Pinus taeda*..... **Managed Tree Plantation - Southeast Conifer & Hardwood Plantation Group (2502)**

5b. Not a tree plantation or planted stand of trees ..... 6

6a. Uplands (not riparian or influenced by flooding or saturation) ..... 12

6b. Wetlands (influenced by flooding or saturation) or riparian areas, including both first and second bottoms of the Mississippi Alluvial Plain (Level III Ecoregion 73)..... 7

7a. Wetlands (riparian or influenced by flooding or saturation) with >20% relative cover of *Triadica sebifera* (Chinese tallow tree) ..... **Introduced Wetland Vegetation – Treed (2185)**

7b. Wetlands (riparian or influenced by flooding or saturation) with <20% relative cover of *Triadica sebifera* (Chinese tallow tree)..... 8

8a. Vegetation with significant cover of by non-native perennial shrubs or herbaceous plants, riparian areas with moderate to high cover of invasive exotic plants, (i.e. >20% relative cover of *Ligustrum sinense*, *Lygodium japonicum*, *Paspalum urvillei*, or *Cyperus entrerianus*)..... **Introduced Riparian Vegetation (2180)**

8b. Wetland or riparian areas with <20% relative cover of non-native perennial herbaceous plants ..... 9

9a. Forests, prairies and woodlands on Pleistocene terraces in the Mississippi Alluvial Plain of Arkansas, Missouri and Louisiana. Primarily west of Crowley's Ridge on the Western Lowlands Pleistocene Valley Trains (Ecoregion 73g) glacial outwash deposits in Arkansas and Missouri, and on Macon Ridge (Ecoregion 73j) in Louisiana and adjacent Arkansas. These communities have a large variety of upland and lowland tree species, ranging from *Quercus stellata* (Post Oak) to *Quercus lyrata* (Overcup Oak) in a small area. .... **Lower Mississippi River Flatwoods (2513)**

9b. Other forested wetlands along rivers, creeks or in non-alluvial flats with organic soils or organic upper soil horizons ..... 10

10a. Wetland and riparian forests along creeks or rivers, upstream from tidal influence ..... 11

10b. Wetlands in poorly drained, organic or mineral soil flats or basins, including areas with fresh tidal influence and non-tidal areas saturated by rainfall and seasonal high water tables. .... **Gulf and Atlantic Coastal Plain Swamp Systems (2480)**

- 11b. Wetland and riparian forests along small streams, upstream from tidal influence.....  
..... **Gulf and Atlantic Coastal Plain Small Stream Riparian Systems (2474)**
- 11b. Wetland and riparian forests along rivers, upstream from tidal influence .....  
..... **Gulf and Atlantic Coastal Plain Floodplain Systems (2473)**
- 12a. Dominated, codominated or with significant cover (with >20% relative cover) of exotic (non-native) trees such as;  
*Melia azedarach, Broussonetia papyrifera, Vernicia fordii, Paulownia tomentosa, Ailanthus altissima,*  
*Cinnamomum camphora, Albizia julibrissin* ..... **Introduced Upland Vegetation – Treed (2187)**
- 12b. Forest or woodland with native tree cover generally greater than 10% and relative cover of exotic trees <20% .. **13**
- 13a. Successional forest on uplands dominated (with >40% relative cover) by some combination of *Pinus taeda, Acer rubrum, Quercus nigra, Liquidambar styraciflua, Liriodendron tulipifera* ..... **Ruderal Upland – Treed (9999)**
- 13b. Natural forest or woodland with at least 60% relative cover of native late successional trees, not dominated by successional species..... **14**
- 14a. Forest dominated or codominated by Live Oak (*Quercus virginiana*) and/or Southern Magnolia (*Magnolia grandiflora*) on barrier islands (i.e. Grande Isle in Louisiana) or salt domes in the Mississippi River Deltaic Plain ..... **Mississippi Delta Maritime Forest (2384)**
- 14b. Not on barrier islands (i.e. Grande Isle in Louisiana) or salt domes in the Mississippi River Deltaic Plain ..... **15**
- 15a. Vegetation of sand dunes and related eolian features of the Western Lowlands Holocene Meander Belts (Ecoregion 73f) and Western Lowlands Pleistocene Valley Trains (Ecoregion 73g) in Missouri and Arkansas, in the area of the Black, White and Cache Rivers. The dunes support a xeric community of very open *Quercus stellata* woodlands with *Schizachyrium scoparium* and abundant lichen cover (presumably *Cladonia* spp.), along with *Opuntia* sp. Less edaphically extreme slopes support more closed-canopied forests with *Quercus stellata, Quercus falcata* and possibly other species ..... **Lower Mississippi River Dune Woodland and Forest (2381)**
- 15b. Forest vegetation of Crowley’s Ridge in the Bluff Hills (Ecoregion 74a) in Arkansas or Missouri or on the erosional slopes and hills that bound the Grand Prairie (Ecoregion 73e) of Arkansas or Macon Ridge (Ecoregion 73j) in Louisiana and Arkansas. These ecological systems were formerly treated as one unit, the Mississippi River Alluvial Plain Loess Slope Forest (2322) ..... **16**
- 16a. Forests not on ridgetops dominated by *Pinus echinata*, generally on southern Crowley’s Ridge in the Bluff Hills (Ecoregion 74a) or on the erosional slopes and hills that bound the Grand Prairie (Ecoregion 73e) of Arkansas or Macon Ridge (Ecoregion 73j) in Louisiana or Arkansas..... **17**
- 16b. Forests on ridgetops dominated by *Pinus echinata* with varying amounts of *Quercus alba, Quercus rubra, Quercus falcata, Quercus stellata, Carya texana,* and *Quercus velutina*. On northern Crowley's Ridge in the Bluff Hills (Ecoregion 74a), but there are limited occurrences on southern Crowley’s Ridge, on sandy, exposed sites ..... **Northern Crowley's Ridge Sand Forest (2510)**
- 17a. Dry-mesic upland forest dominated by *Quercus alba, Quercus rubra* (Crowley's Ridge only), *Quercus falcata, Quercus pagoda, Quercus stellata, Carya texana, Quercus shumardii,* and *Quercus velutina* mostly on west-facing loess slopes on southern Crowley's Ridge in the Bluff Hills (Ecoregion 74a) and in the erosional slopes and hills that bound the Grand Prairie (Ecoregion 73e) of Arkansas or Macon Ridge (Ecoregion 73j) in Louisiana or Arkansas .  
..... **Mississippi River Alluvial Plain Dry-Mesic Loess Slope Forest(2509)**
- 17b. Mesic forests typically dominated by beech, oaks and other hardwoods on mesic slopes of Crowley’s Ridge in the Bluff Hills (Ecoregion 74a), generally south of Jonesboro, Arkansas.....  
..... **Southern Crowley's Ridge Mesic Loess Slope Forest (2322)**

**KEY B: Upland Forest, Woodland, and Savanna Ecological Systems of the South Central Plains, Western Gulf Coastal Plain or East-Central Texas Plains, Map Zone 37**

- 1a. Trees in planted stands generally with >70% relative cover of *Pinus palustris*, *Pinus elliottii*, or *Pinus taeda*.....  
..... **Managed Tree Plantation - Southeast Conifer & Hardwood Plantation Group (2502)**
- 1b. Not a tree plantation or planted stand of trees ..... 2
- 2a. Vegetation with significant cover of non-native perennial shrubs or herbaceous plants, riparian areas with moderate to high cover of invasive exotic plants, (i.e. >20% relative cover of *Ligustrum sinense*, *Lygodium japonicum*, *Paspalum urvillei*, or *Cyperus entrerianus*) ..... **Introduced Riparian Vegetation (2180)**
- 2b. Vegetation without significant cover of non-native shrubs or non-native perennial herbaceous plants.....3
- 3a. Relative cover of exotic (non-native) trees >20%. This includes trees such as; *Melia azedarach*, *Broussonetia papyrifera*, *Vernicia fordii*, *Paulownia tomentosa*, *Ailanthus altissima*, *Cinnamomum camphora*, *Albizia julibrissin* ..... **Introduced Upland Vegetation – Treed (2187)**
- 3b. Forest or woodland dominated by native trees, relative cover of exotic trees <20% ..... 4
- 4a. Successional forest dominated (with >40% relative cover) by some combination of , *Acer rubrum*, *Quercus nigra*, and/or *Liquidambar styraciflua* ..... **Ruderal Upland – Treed (9999)**
- 4b. Natural forest or woodland dominated by native trees, and not obviously successional or dominated by successional species ..... 5
- 5a. Forests occurring inland, not on Cheniers, coastal fringe, salt domes or Ingleside barrier strandplain..... 6
- 5b. Forest along the northern Gulf of Mexico, from Louisiana to the upper Texas coast, including shell ridges along the coast and bay margins, coastal salt domes, stranded ancient barrier ridges (Ingleside barrier strandplain), and chenier ridges of the chenier plain dominated or codominated by *Quercus virginiana*, *Magnolia grandiflora*, *Quercus pagoda*, *Celtis laevigata*, *Zanthoxylum clava-herculis*, *Acacia farnesiana*, *Prunus caroliniana*, *Opuntia stricta* var. *dillenii*, *Lycium carolinianum* var. *quadrifidum*, or *Yucca aloifolia* ..... **West Gulf Coastal Plain Chenier and Upper Texas Coastal Fringe Forest and Woodland (2339)**
- 6a. Forests or Woodlands of the Western Gulf Coastal Plain (Level III Ecoregion 34) or South Central Plains (Level III Ecoregion 35). Note that this key is only intended for areas north, northeast, and east of Houston, TX ..... 8
- 6b. Forests or Woodlands of the Texas Blackland Prairies (Level III Ecoregion 32) or East-Central Texas Plains (Level III Ecoregion 33). Note that this key is only intended for areas east of Waco and Dallas, TX and north, northeast, and east of Houston, TX ..... 7
- 7a. Post Oak savanna woodlands on sandy or loamy soils of the East-Central Texas Plains (Level III Ecoregion 33), containing species of eastern affinities such as *Sassafras albidum*, *Cornus florida*, *Vaccinium arboreum*, *Ulmus alata*, and particularly *Ilex vomitoria* ..... **East-Central Texas Plains Post Oak Savanna and Woodland (2519)**
- 7b. Forests or Woodlands of the Texas Blackland Prairies (Level III Ecoregion 32), lacking species of eastern affinities such as *Sassafras albidum*, *Cornus florida*, *Vaccinium arboreum*, *Ulmus alata*, and *Ilex vomitoria*.... **Crosstimbers Oak Forest and Woodland (2308)**
- 8a. Hardwood forests of ravines and slopes, with mesic hardwoods such as *Fagus grandifolia*, *Quercus alba*, *Ilex opaca* and sometimes sparse trees of *Pinus taeda* ..... **West Gulf Coastal Plain Mesic Hardwood Forest (2323)**
- 8b. Pine or pine mixed with hardwood forests and woodlands, not mesic forests of ravines and slopes ..... 9
- 9a. Flatwoods in inland portions of the South Central Plains (Level III Ecoregion 35), on nonriverine, Pleistocene high terraces. Local topography is a complex of ridges and swales, often in close proximity to one another. The driest ridges support *Pinus taeda* and *Quercus stellata*; more mesic ridges have *Pinus taeda* with *Quercus alba* and understory species such as *Symplocos tinctoria* and *Viburnum dentatum*. Swales tend to support hardwood forests or swamps, often heavily oak-dominated with species tolerant of some inundation, such as *Quercus phellos* and *Quercus laurifolia*..... **West Gulf Coastal Plain Pine-Hardwood Flatwoods (2458)**
- 9b. Pine or pine mixed with hardwood forests and woodlands, not flatwoods ..... 10

- 10a. Forests or woodlands with Longleaf Pine (*Pinus palustris*)..... **11**
- 10b. Forests or woodlands lacking Longleaf Pine (*Pinus palustris*), generally dominated by Oak, Shortleaf Pine (*Pinus echinata*) and/or Loblolly Pine (*Pinus taeda*)..... **12**
- 11a. Longleaf pine (*Pinus palustris*) sandhill woodlands associated with areas of deep sand (ranging in texture from coarse to fine) which are present in quaternary alluvial deposits. The general habitat is on low terraces adjacent to stream floodplains.....**West Gulf Coastal Plain Stream Terrace Sandhill Longleaf Pine Woodland (2521)**
- 11b. Longleaf pine (*Pinus palustris*) sandhill woodlands in upland areas of deep sand away from alluvial deposits or stream floodplains.....**West Gulf Coastal Plain Upland Longleaf Pine Forest and Woodland (2348)**
- 12a. Forests and woodlands dominated by *Pinus taeda* and/or *Pinus echinata* in combination with a host of dry to dry-mesic site hardwood species, on side slopes, with moderate fertility and moisture retention ..... **West Gulf Coastal Plain Pine-Hardwood Forest (2371)**
- 12b. Woodlands on deep coarse sandy soils, with species tolerant of droughty sites, especially *Quercus incana* and *Quercus arkansana*, but also *Quercus marilandica* and *Quercus stellata*. *Pinus palustris* is absent (or perhaps at low frequency within its range); *Pinus echinata* is usually present..... **West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest and Woodland (2378)**

**KEY C: Wetland Forest, Woodland, and Savanna Ecological Systems of the South Central Plains, Western Gulf Coastal Plain or East-Central Texas Plains, Map Zone 37**

1a. Trees in planted stands generally with >70% relative cover of *Pinus palustris*, *Pinus elliottii*, or *Pinus taeda*.....  
..... **Managed Tree Plantation - Southeast Conifer & Hardwood Plantation Group (2502)**

1b. Not a tree plantation or planted stand of trees ..... 2

2a. Riparian areas with > 20% relative cover of non-native perennial shrubs or herbaceous plants, (i.e. >20% relative cover of *Ligustrum sinense*, *Paspalum urvillei*, *Lygodium japonicum*, or *Cyperus entrerianus*).....  
..... **Introduced Riparian Vegetation (2180)**

2b. Vegetation not dominated by or with significant cover of non-native shrubs or perennial herbaceous plants.....3

3a. Wetlands (riparian or influenced by flooding or saturation) with >20% relative cover of *Triadica sebifera* (Chinese tallow tree) ..... **Introduced Wetland Vegetation – Treed (2185)**

3b. Wetlands (riparian or influenced by flooding or saturation) with <20% relative cover of *Triadica sebifera* (Chinese tallow tree)..... 4

4b. Flat, mesic to poorly drained wetland Longleaf Pine woodlands, on lower terraces of the Gulf Coastal Plain .....  
..... **West Gulf Coastal Plain Wet Longleaf Pine Savanna and Flatwoods (2451)**

4b. Forests and woodlands not dominated by Longleaf Pine ..... 5

5a. Flatwoods in inland portions of the South Central Plains (Ecoregions 35a, 35c, 35d, 35e, 35f, and 35h) on nonriverine, Pleistocene high terraces. Local topography is a complex of ridges and swales, often in close proximity to one another. The driest ridges support *Pinus taeda* and *Quercus stellata*; more mesic ridges have *Pinus taeda* with *Quercus alba* and understory species such as *Symplocos tinctoria* and *Viburnum dentatum*. Swales tend to support hardwood forests or swamps, often heavily oak-dominated with species tolerant of some inundation, such as *Quercus phellos*, *Quercus michauxii* and *Quercus laurifolia*.....  
..... **West Gulf Coastal Plain Pine-Hardwood Flatwoods (2458)**

5b. Pine or pine mixed with hardwood forests and woodlands, not flatwoods ..... 6

6a. Forests and shrublands on saturated soils associated with springs and seepage flow characterized by *Magnolia virginiana*, *Nyssa sylvatica*, *Nyssa biflora*, and *Acer rubrum*. Southerly examples generally consist of broad-leaved evergreen forests, while more northerly examples support more mixed evergreen-deciduous forests. In addition, evergreen species such as *Cyrilla racemiflora* and *Ilex coriacea* are especially pronounced in the shrub layer of southern examples ..... **West Gulf Coastal Plain Seepage Swamp and Baygall (2462)**

6b. Other forested wetlands along rivers, creeks or in non-alluvial flats with organic soils or organic upper soil horizons ..... 7

7a. Wetland and riparian forests along creeks or rivers, upstream from tidal influence ..... 8

7b. Wetlands in poorly drained, organic or mineral soil flats or basins, saturated by rainfall and seasonal high water tables. Not associated with non-tidal river floodplains, although tidal swamps are included here.....  
..... **Gulf and Atlantic Coastal Plain Swamp Systems (2480)**

8b. Wetland and riparian forests along small streams, upstream from tidal influence.....  
..... **Gulf and Atlantic Coastal Plain Small Stream Riparian Systems (2474)**

8b. Wetland and riparian forests along rivers, upstream from tidal influence.....  
..... **Gulf and Atlantic Coastal Plain Floodplain Systems (2473)**

**KEY D: Herbaceous Ecological Systems of the South Central Plains, Western Gulf Coastal Plain or East-Central Texas Plains, Map Zone 37**

- 1a. Vegetation dominated by native plants, non-native perennial herbaceous plants or grasses having <20% relative cover ..... **3**
- 1b. Vegetation with non-native perennial herbaceous plants or grasses having >20% relative cover ..... **2**
  
- 2a. Vegetation with significant cover of non-native perennial herbaceous plants, riparian areas with moderate to high cover of invasive exotic plants, (i.e. >20% relative cover of *Ligustrum sinense*, *Lygodium japonicum*, *Paspalum urvillei*, or *Cyperus enterianus*) ..... **Introduced Riparian Vegetation (2180)**
- 2b. Vegetation with non-native perennial herbaceous plants or grasses having >20% relative cover and >20% relative cover with any combination of these species: *Paspalum notatum*, *Imperata cylindrica*, *Cynodon dactylon*, *Sorghum halepense*, *Sporobolus indicus*, *Lespedeza cuneata*, *Eremochloa ophiuroides*, *Solanum viarum* ..... **Introduced Upland Vegetation - Perennial Grassland and Forbland (2182)**
  
- 3a. Prairies, barrens or glades not near the coast but in the South Central Plains (Level III Ecoregions 35, 33, or 32 within Map Zone 37) ..... **7**
- 3b. Coastal prairies, prairie ponds and tidal marshes in the Western Gulf Coastal Plain (Level III Ecoregion 34) ..... **4**
  
- 4a. Fresh and saline, wind and lunar tidal herbaceous vegetation of the Texas - Louisiana Coastal Marshes (Ecoregion 34g) ..... **Gulf and Atlantic Coastal Plain Tidal Marsh Systems (2490)**
- 4b. Herbaceous prairie (including saline, but not tidal prairie) and herbaceous ponds within the Northern Humid Gulf Coastal Prairies (Ecoregion 34a) ..... **5**
  
- 5a. Small to moderately large ponds and swales in the coastal prairie of southeastern Texas and adjacent Louisiana, typically dominated by *Eleocharis quadrangulata* ..... **Texas-Louisiana Coastal Prairie Pondshore (2487)**
- 5b. Grassland vegetation of coastal prairies, characteristically dominated by *Spartina spartinae*, *Schizachyrium scoparium*, *Paspalum plicatulum*, *Sorghastrum nutans*, *Andropogon gerardii*; other dominants may include *Schizachyrium littorale* and *Muhlenbergia capillaris*. This system includes depressions often dominated by *Spartina patens*, *Panicum virgatum* or *Tripsacum dactyloides* ..... **6**
  
- 6a. Grassland vegetation occurring in soils which are not saline, characterized by a ridge-and-swale or mound-and-intermound microtopography and encompasses both upland and wetland plant communities. Upland dominants include *Schizachyrium scoparium*, *Paspalum plicatulum*, *Sorghastrum nutans*, and *Andropogon gerardii*. Wetland dominants in undisturbed occurrences include *Panicum virgatum* and *Tripsacum dactyloides*; disturbed occurrences may be dominated by *Andropogon glomeratus*. This Ecological System was not included in the sequence table. .... **Texas-Louisiana Coastal Prairie (2434)**
  
- 6b. Grassland vegetation occurring on saline soils that are often saturated by local rainfall and periodically flooded by saline waters during major storm events, characteristically dominated by *Spartina spartinae*; other dominants may include *Schizachyrium littorale* and *Muhlenbergia capillaris*. This system includes depressions often dominated by *Spartina patens* ..... **Texas Saline Coastal Prairie (2486)**
  
- 7a. Prairie grasslands found in the Blackland Prairie (Ecoregion 35h) area in SW Arkansas. Usually with some of these plants: *Sorghastrum nutans*, *Bouteloua curtipendula*, *Andropogon glomeratus*, *Leersia virginica*, *Panicum anceps*, *Panicum flexile*, *Sporobolus compositus*, *Fimbristylis puberula* var. *puberula*, *Carex cherokeensis*, *Carex microdonta*, *Echinacea pallida*, *Liatis aspera*, *Marshallia caespitosa*, *Silphium integrifolium*, *Silphium laciniatum*, *Solidago auriculata*, *Symphytotrichum lanceolatum*, *Packeria tampicana*, *Thelesperma filifolium*, *Nemastylis geminiflora*, *Dalea purpurea*, *Lythrum alatum*, *Allium canadense* var. *mobilese*, *Zigadenus nuttallii* ..... **West Gulf Coastal Plain Northern Calcareous Prairie (2428)**
- 7b. Prairie, savanna, woodland or glades not found in the Blackland Prairie (Ecoregion 35h) area in SW Arkansas ..... **8**
  
- 8a. Prairie, Savanna or Woodland of the East-Central Texas Plains or the Fayette Prairie (Ecoregion 32b) or San Antonio Prairie (Ecoregion 33c) ..... **12**

- 8b. Glades, prairies or barrens of the Tertiary Uplands (Ecoregion 35a) or Southern Tertiary Uplands (Ecoregion 35e), not Blackland Prairie (Ecoregion 35h) ..... 9
- 9a. Prairies or barrens of the Southern Tertiary Uplands (Ecoregion 35e)..... 11
- 9b. Glades of the Tertiary Uplands (Ecoregion 35a)..... 10
- 10a. Glade system present only in Saline and Pulaski counties, Arkansas, on distinctive, massive outcrops of igneous substrate called nepheline syenite. Zonal vegetation communities are present around the outcrops. Interior herbaceous-dominated zones can be mesic to wet as springs and small ephemeral streams flow across the rock outcrops and water pools in flat areas. Some examples will have open stands of *Quercus stellata*, but trees may be absent. Some typical dominant grasses include *Schizachyrium scoparium*, *Piptochaetium avenaceum*, *Aristida purpurascens*, and *Sporobolus clandestinus*..... **West Gulf Coastal Plain Nepheline Syenite Glade (2405)**
- 10b. Glades on outcrops of marine sediment or glauconitic clays of the Weches Formation in central eastern Texas, primarily in San Augustine, Nacogdoches, and Sabine counties. These outcrops are exposed by natural erosion of hillside slopes. Soils are shallow, rocky and basic, factors which tend to inhibit growth of woody vegetation. Outcrops are seepy and saturated during winter and early spring but become hard and dry in the summer. Characteristic species include *Sedum pulchellum*, *Clinopodium arkansanum*, and *Sporobolus vaginiflorus*. A scattered shrub layer, including *Cercis canadensis*, *Cornus drummondii*, *Juniperus virginiana*, and *Sideroxylon lanuginosum*, may be present on some sites .....**West Gulf Coastal Plain Weches Glade (2404)**
- 11a. Barrens confined to the Catahoula geologic formation of eastern Texas and western Louisiana, in a mosaic ranging from herbaceous-dominated areas on shallow soil and exposed sandstone to deeper soils with open woodland vegetation. Woodlands include a post oak-dominated overstory grading into longleaf pine-dominated areas. Undisturbed examples are dominated by *Bigelovia nuttallii*, *Aristida longispica*, *Schizachyrium scoparium*, *Croton michauxii*, and *Sporobolus silveanus* (Marietta and Nixon 1984) ..... **West Gulf Coastal Plain Catahoula Barrens (2403)**
- 11b. Prairie vegetation on the Fleming geologic formation, Cook Mountain Formation (in Louisiana), the Jackson Group (in Louisiana), and the Morse Clay Calcareous Prairie of northwestern Louisiana. Typical species include *Dalea compacta* var. *compacta*, *Rudbeckia missouriensis*, *Acacia angustissima*, *Liatris mucronata*, *Eustoma exaltatum* ssp. *russellianum* (= *Eustoma russellianum*), *Grindelia lanceolata*, *Agalinis heterophylla*, *Stenosiphon linifolius*, *Carex microdonta*, *Carex cherokeensis*, *Neptunia lutea*, *Indigofera miniata* (= *Indigofera miniata* var. *leptosepala*), *Palafoxia reverchonii*, *Onosmodium molle* ssp. *occidentale* (= *Onosmodium occidentale*), and *Euphorbia bicolor* . .....**West Gulf Coastal Plain Southern Calcareous Prairie (2429)**
- 12a. Prairie underlain by Vertisols and Alfisols of the Fayette Prairie (Ecoregion 32b) or San Antonio Prairie (Ecoregion 33c) *Schizachyrium scoparium* and *Sorghastrum nutans* are the most frequent species ..... **Southern Blackland Tallgrass Prairie (2422)**
- 12b. Prairie punctuated by short, stunted woodlands and forests dominated by *Quercus stellata* and *Quercus marilandica* of the East-Central Texas Plains (Level III Ecoregion 33) ..... **East-Central Texas Plains Post Oak Savanna and Woodland (2519)**

**KEY E: Upland Forest, Woodland, and Savanna Ecological Systems of the Southeastern Plains and Southern Coastal Plain, Map Zones 46 & 99**

1a. Trees in planted stands generally with >70% relative cover of <i>Pinus palustris</i> , <i>Pinus elliottii</i> , or <i>Pinus taeda</i> .....	<b>Managed Tree Plantation - Southeast Conifer &amp; Hardwood Plantation Group (2502)</b>
1b. Not a tree plantation or planted stand of trees .....	<b>2</b>
2a. Vegetation with significant cover of non-native perennial shrubs or herbaceous plants, riparian areas with moderate to high cover of invasive exotic plants, (i.e. >20% relative cover of <i>Ligustrum sinense</i> , <i>Lygodium japonicum</i> , <i>Paspalum urvillei</i> , or <i>Cyperus entrerianus</i> ) .....	<b>Introduced Riparian Vegetation (2180)</b>
2b. Vegetation not dominated by non-native shrubs or perennial herbaceous plants.....	<b>3</b>
3a. Vegetation with significant cover (with >20% relative cover) of exotic (non-native) trees such as; <i>Melia azedarach</i> , <i>Broussonetia papyrifera</i> , <i>Vernicia fordii</i> , <i>Paulownia tomentosa</i> , <i>Ailanthus altissima</i> , <i>Cinnamomum camphora</i> , <i>Albizia julibrissin</i> .....	<b>Introduced Upland Vegetation – Treed (2187)</b>
3b. Forest or woodland dominated by native trees, relative cover of exotic trees <20% .....	<b>4</b>
4a. Successional forest dominated (with >40% relative cover) by some combination of <i>Pinus taeda</i> , <i>Acer rubrum</i> , <i>Quercus nigra</i> , <i>Liquidambar styraciflua</i> , <i>Liriodendron tulipifera</i> .....	<b>Ruderal Upland – Treed (9999)</b>
4b. Natural forest or woodland dominated by native trees, and not obviously successional or dominated by successional species .....	<b>5</b>
5a. Forests or woodlands dominated by Longleaf Pine ( <i>Pinus palustris</i> ) or Slash Pine ( <i>Pinus elliottii</i> ) .....	<b>6</b>
5b. Not dominated or characterized by Longleaf Pine ( <i>Pinus palustris</i> ) or Slash Pine ( <i>Pinus elliottii</i> ) .....	<b>8</b>
6a. Open forests or woodlands on broad, sandy flatlands along the northern Gulf of Mexico coast east of the Mississippi River, in the Gulf Coast Flatwoods Ecoregion 75a (EPA 2004). These Flatwoods are subject to high fire-return intervals and seasonally high water tables. The tree canopy is characterized by <i>Pinus palustris</i> and to a lesser degree by <i>Pinus elliottii</i> . Understories are densely shrubby to open and herbaceous-dominated, often with <i>Serenoa repens</i> , <i>Ilex coriacea</i> , or <i>Ilex glabra</i> .....	<b>East Gulf Coastal Plain Near-Coast Pine Flatwoods (2454)</b>
6b. Forests and woodlands on upland dry sands or loamy sands, north of the Gulf Coast Flatwoods Ecoregion 75a (EPA 2004). Understories with oak shrubs (i.e. <i>Quercus laevis</i> , <i>Quercus incana</i> , <i>Quercus marilandica</i> , <i>Quercus margattiae</i> ) generally lacking <i>Serenoa repens</i> , <i>Ilex coriacea</i> , or <i>Ilex glabra</i> .....	<b>7</b>
7a. Stands of Longleaf Pine ( <i>Pinus palustris</i> ) on excessively well-drained, sandy soils in the Outer Coastal Plain and adjacent Inner Coastal Plain of Florida.....	<b>Florida Longleaf Pine Sandhill (2356)</b>
7b. Longleaf pine forests of rolling, dissected uplands south of Jackson, MS, Tuscaloosa and Montgomery, AL in the Southern Rolling Plains (Ecoregion 74c) and Southeastern Plains (Level III Ecoregion 65), in Alabama, Mississippi, the Florida Parishes of Louisiana, and on medium- to fine-textured soils (but not coarse sands) in west Florida .....	<b>East Gulf Coastal Plain Interior Upland Longleaf Pine Woodland (2349)</b>
8a. Woody vegetation present on barrier islands and near-coastal strands along the northern Gulf of Mexico, dominated by a variety of needle-leaved and broad-leaved evergreen trees, including <i>Pinus clausa</i> , <i>Pinus elliottii</i> var. <i>elliottii</i> , <i>Pinus palustris</i> , <i>Quercus virginiana</i> , <i>Sabal palmetto</i> , <i>Carya glabra</i> , and <i>Carya pallida</i> . Wetland inclusions may be dominated by <i>Taxodium ascendens</i> and <i>Magnolia virginiana</i> .....	<b>East Gulf Coastal Plain Maritime Forest (2380)</b>
8b. Woody vegetation found inland from the coast, not on barrier islands and near-coastal strands.....	<b>9</b>
9a. Flatwoods occurring in West Tennessee, dominated by various combinations of oaks and other hardwoods, including <i>Quercus pagoda</i> , <i>Quercus palustris</i> , <i>Quercus falcata</i> , <i>Quercus nigra</i> , <i>Quercus phellos</i> , <i>Quercus michauxii</i> , <i>Quercus alba</i> , <i>Liquidambar styraciflua</i> , <i>Carya</i> spp., <i>Nyssa sylvatica</i> , and <i>Acer rubrum</i> . Most historic occurrences have been cleared, drained and tiled, and remaining sites are small and degraded .....	<b>South-Central Interior / Upper Coastal Plain Wet Flatwoods (2457)</b>
9b. Sites not having the above combination of characteristics, occurs in Alabama, Mississippi, Florida, or Louisiana	<b>10</b>
10a. Mesic forests on slopes or bluffs .....	<b>11</b>
10b. Dry to dry-mesic forests or woodlands, on flat or rolling uplands.....	<b>15</b>

- 11a. Forests on loess bluffs on the edge of the Mississippi River Alluvial Plain in Tennessee, Mississippi or Louisiana ("Bluff Hills" [Ecoregion 74a] of EPA (2004)) or the immediately adjacent Southern Rolling Plains (western portion of Ecoregion 74c) along the eastern edge of the Mississippi River Alluvial Plain in southwestern Mississippi and adjacent Louisiana ..... **12**
- 11b. Forests on slopes or bluffs in other areas of the East Gulf or Upper East Gulf Coastal Plains ..... **13**
- 12a. Bluff forests south of the Big Black River, which is the Warren/Claiborne County Line in Mississippi (at ~32 degrees N Latitude) ..... **East Gulf Coastal Plain Southern Loess Bluff Forest (2329)**
- 12b. Bluff forests north of the Big Black River, which is the Warren/Claiborne County Line in Mississippi (at ~32 degrees N Latitude) ..... **East Gulf Coastal Plain Northern Loess Bluff Forest (2327)**
- 13a. Deciduous forests where limestone or other calcareous substrates occur near enough to the surface to influence vegetation composition. Examples are most common in the Blackland Prairie (Ecoregion 65a) and Flatwoods/Blackland Prairie Margins (Ecoregion 65b) in Alabama and Mississippi. Stands are dominated by oaks and hickories, particularly species which are indicative of finer-textured soils and/or a higher base status in the soil (e.g., *Carya caroliniae-septentrionalis*, *Quercus muehlenbergii*, *Quercus pagoda*, *Quercus shumardii*, *Quercus stellata*) ..... **East Gulf Coastal Plain Limestone Forest (2328)**
- 13b. Forests apparently not influenced by limestone or other calcareous substrates ..... **14**
- 14a. Forests north of the natural ranges of Southern Magnolia (*Magnolia grandiflora*) and Spruce Pine (*Pinus glabra*), a line about at Interstate 20 in Mississippi and US 80 in Alabama. Usually with Beech (*Fagus grandifolia*), White Oak (*Quercus alba*), or Pagoda Oak (*Quercus pagoda*) as a dominant tree ..... **East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest (2325)**
- 14b. Forests within the natural ranges of Southern Magnolia (*Magnolia grandiflora*) or Spruce Pine (*Pinus glabra*), south of a line about at Interstate 20 in Mississippi and US 80 in Alabama. Stands are mesic, and vegetation typically includes species such as *Fagus grandifolia*, *Magnolia grandiflora*, and *Illicium floridanum* ..... **Southern Coastal Plain Mesic Slope Forest (2357)**
- 15a. Stands dominated by *Pinus echinata* grading into stands with a mixture of upland hardwoods, between about 32 degrees 30 minutes N latitude and about 35 degrees N latitude; more localized occurrences may be found as small patches to the north and south ..... **East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest (2372)**
- 15b. Stands generally lacking *Pinus echinata*, or having low relative cover of *Pinus echinata* and occurring either north of 35 degrees N latitude or south of 32 degrees 30 minutes N latitude ..... **16**
- 16a. Dry upland hardwood forests of the Gulf Coastal Plains, ranging as far north as Grenada, MS and Tuscaloosa, AL. Occurs throughout the Southern Hilly Gulf Coastal Plain (Ecoregion 65d), (EPA 2004) northward across the Blackland Prairie (Ecoregion 65a) in Alabama and into the Fall Line Hills (Ecoregion 65i) to approximately Tuscaloosa. *Quercus hemisphaerica* is a typical species in many examples, with *Quercus stellata*, *Quercus falcata*, and *Quercus alba* less frequently encountered, but dominant in some stands ..... **Southern Coastal Plain Dry Upland Hardwood Forest (2330)**
- 16b. Dry upland hardwood forests, generally north of Grenada, MS and Tuscaloosa, AL ..... **17**
- 17a. Dry upland, predominantly hardwood forests of limited portions of the Coastal Plain of western Tennessee, northern Mississippi and Alabama. The core range of this type lies within the Northern Hilly Coastal Plain (Level IV Ecoregion 65e) of Omernik (EPA 2004), which includes the Northern Pontotoc Ridge (231Bk), Upper Loam Hills (231Bd), and Northern Loessal Hills (231Hb) subsections of Cleland et al. (2005). These forests are generally dominated by White Oak (*Quercus alba*), but also may contain Stands may contain *Aesculus pavia*, *Carya alba*, *Carya glabra*, *Carya pallida*, *Kalmia latifolia*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Ostrya virginiana*, *Oxydendrum arboreum*, *Quercus alba*, *Quercus falcata*, *Quercus marilandica*, *Quercus muehlenbergii*, *Quercus pagoda*, *Quercus stellata*, *Quercus velutina*, *Styrax grandifolius*, *Vaccinium arboreum*, and *Vaccinium stamineum* ..... **East Gulf Coastal Plain Northern Dry Upland Hardwood Forest (2307)**
- 17b. Hardwood forests of the Loess Plains (Ecoregion 74b) of Omernik (EPA 2004) in NW Mississippi and W Tennessee, occurring north of 34 degrees N latitude. Generally in an area east of the Delta, and west of a line from Grenada to Sardis to Holly Springs, MS then to Somerville and Jackson, TN. Canopy dominants include *Quercus falcata*, *Quercus alba*, *Carya alba*, *Quercus stellata*, *Quercus marilandica*, and *Quercus velutina*. The extent of this

forested system has been heavily reduced, cleared for agriculture due to the rich productive soils derived from relatively thick loess deposits ..... **East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland (2306)**

**KEY F: Wetland Forest, Woodland, and Savanna Ecological Systems of the Southeastern Plains and Southern Coastal Plain, Map Zones 46 & 99**

- 1a. Trees in planted stands generally with >70% relative cover of *Pinus palustris*, *Pinus elliottii*, or *Pinus taeda*.....  
 ..... **Managed Tree Plantation - Southeast Conifer & Hardwood Plantation Group (2502)**
- 1b. Not a tree plantation or planted stand of trees ..... 2
- 2a. Vegetation with significant cover of non-native perennial shrubs or herbaceous plants, riparian areas with moderate to high cover of invasive exotic plants, (i.e. >20% relative cover of *Ligustrum sinense*, *Lygodium japonicum*, *Paspalum urvillei*, or *Cyperus entrerianus*) ..... **Introduced Riparian Vegetation (2180)**
- 2b. Vegetation not dominated by non-native shrubs or perennial herbaceous plants.....3
- 3a. Wetlands (riparian or influenced by flooding or saturation) with >20% relative cover of *Triadica sebifera* (Chinese tallow tree) ..... **Introduced Wetland Vegetation – Treed (2185)**
- 3b. Wetlands (riparian or influenced by flooding or saturation) with <20% relative cover of *Triadica sebifera* (Chinese tallow tree)..... 4
- 4a. Small forested wetlands in poorly drained depressions, typically dominated by *Taxodium ascendens*, with a characteristic and unique dome-shaped appearance in which trees in the center are higher than those around the sides. Other woody species may include *Nyssa biflora*, *Hypericum chapmanii*, *Hypericum myrtifolium*, *Ilex myrtifolia*, *Leucothoe racemosa*, *Morella cerifera*, *Cephalanthus occidentalis*, *Liquidambar styraciflua*, *Clethra alnifolia*, *Lyonia lucida*, and *Styrax americanus*. .....  
 ..... **Southern Coastal Plain Nonriverine Cypress Dome (2460)**
- 4b. Not in poorly drained depressions, not dominated by *Taxodium ascendens* or *Hypericum chapmanii* ..... 5
- 5a. Flatwoods; forests or woodlands occurring in non-riparian flats which have the soil saturated at certain times of the year, but have standing water only for short periods in the growing season, or in for longer periods in scattered depressions ..... 6
- 5b. Not flatwoods, but occurs in basins, seepage wetlands or riparian areas ..... 8
- 6a. Open forests or woodlands on broad, sandy flatlands along the northern Gulf of Mexico coast east of the Mississippi River, in the Gulf Coast Flatwoods Ecoregion 75a (EPA 2004). These Flatwoods are subject to high fire-return intervals and seasonally high water tables. The tree canopy is characterized by *Pinus palustris* and to a lesser degree by *Pinus elliottii*. Understories are densely shrubby to open and herbaceous-dominated, often with *Serenoa repens*, *Ilex coriacea*, or *Ilex glabra* ..... **East Gulf Coastal Plain Near-Coast Pine Flatwoods (2454)**
- 6b. Forests and woodlands not dominated by Longleaf Pine or Slash Pine ..... 7
- 7a. Flatwoods; open forests dominated by *Pinus taeda* or *Pinus glabra* with grassy groundcover (i.e. *Chasmanthium sessilifolium*) interspersed with patches of *Quercus phellos* and sometimes other tree species. The ground surface displays an evident microtopography of alternating mounds and swales occurring in a tight local mosaic. **East Gulf Coastal Plain Southern Loblolly-Hardwood Flatwoods (2455)**
- 7b. Flatwoods occurring in West Tennessee, dominated by various combinations of oaks and other hardwoods, including *Quercus pagoda*, *Quercus palustris*, *Quercus falcata*, *Quercus nigra*, *Quercus phellos*, *Quercus michauxii*, *Quercus alba*, *Liquidambar styraciflua*, *Carya* spp., *Nyssa sylvatica*, and *Acer rubrum*. Most historic occurrences have been cleared, drained and tiled, and remaining sites are small and degraded .....  
 ..... **South-Central Interior / Upper Coastal Plain Wet Flatwoods (2457)**
- 8a. Forested wetlands in acidic, seepage-influenced habitats of the Southeastern Plains (Ecoregion 65), Mississippi Valley Loess Plains (Ecoregion 74) or Southern Coastal Plain (Ecoregion 75) in poorly developed upland drainages, narrow ravine bottoms, bases of steepheads, and small headwaters stream bottoms, and characterized by *Magnolia virginiana* and *Nyssa biflora*. Examples occur within the range of *Persea palustris*, and where *Magnolia virginiana* is an important or even dominant species. Dominant trees in some stands may include *Quercus laurifolia*, *Liquidambar styraciflua*, and *Liriodendron tulipifera*. Some stands may be dominated by *Cyrilla racemiflora* and/or *Cliftonia monophylla*. Other shrubs include *Ilex coriacea*, *Leucothoe axillaris*, *Lyonia lucida*, *Morella carolinensis*, *Morella inodora*, and *Viburnum nudum var. nudum* ..... **Southern Coastal Plain Seepage Swamp and Baygall (2461)**

8b. Other forested wetlands along rivers, creeks or in non-alluvial flats with organic soils or organic upper soil horizons .....	9
9a. Wetland and riparian forests along creeks or rivers, upstream from tidal influence .....	10
9b. Wetlands in poorly drained, organic or mineral soil flats or basins, saturated by rainfall and seasonal high water tables. Not associated with non-tidal river floodplains, although tidal swamps are included here.....	<b>Gulf and Atlantic Coastal Plain Swamp Systems (2480)</b>
10b. Wetland and riparian forests along small streams, upstream from tidal influence.....	<b>Gulf and Atlantic Coastal Plain Small Stream Riparian Systems (2474)</b>
10b. Wetland and riparian forests along rivers, upstream from tidal influence.....	<b>Gulf and Atlantic Coastal Plain Floodplain Systems (2473)</b>

**KEY G: Herbaceous Ecological Systems of the Southeastern Plains and Southern Coastal Plain, Map Zones 46 & 99**

1a. Vegetation dominated by native shrubs or perennial herbaceous plants (<20% relative cover of non-native plants).	3
1b. Vegetation dominated by (i.e. >20% relative cover of) non-native shrubs or perennial herbaceous plants.....	2
2a. Vegetation characterized by non-native perennial herbaceous plants or grasses with >20% grass dominated and >20% relative cover with any combination of these species: <i>Paspalum notatum</i> , <i>Imperata cylindrica</i> , <i>Cynodon dactylon</i> , <i>Sorghum halepense</i> , <i>Sporobolus indicus</i> , <i>Lespedeza cuneata</i> , <i>Eremochloa ophiuroides</i> , <i>Solanum viarum</i> .....	<b>Introduced Upland Vegetation - Perennial Grassland and Forbland (2182)</b>
2b. Vegetation with significant cover of non-native perennial shrubs or herbaceous plants, riparian areas with moderate to high cover of invasive exotic plants, (i.e. >20% relative cover of <i>Ligustrum sinense</i> , <i>Lygodium japonicum</i> , <i>Paspalum urvillei</i> , or <i>Cyperus entrerianus</i> ) .....	<b>Introduced Riparian Vegetation (2180)</b>
3a. Vegetation of the immediate coastal area, including tidal, dune and barrier islands .....	4
3b. Vegetation not if the immediate coastal area, inland.....	5
4a. Tidal marshes (i.e. <i>Spartina alternifolia</i> or <i>Juncus roemerianus</i> ) .....	<b>Gulf and Atlantic Coastal Plain Tidal Marsh Systems (2490)</b>
4b. Vegetation above the regular high tide line, on coastal dunes along the northern Gulf of Mexico, including the northwestern panhandle of Florida, southern Alabama, and southeastern Mississippi. Herbaceous and embedded shrublands on barrier islands and other near-coastal areas where salt spray, saltwater overwash, and sand movement are important ecological forces.....	<b>East Gulf Coastal Plain Dune and Coastal Grassland (2435)</b>
5a. Grass-sedge savannah, wet prairie, wet savanna or lush grassland with relatively thick cover of grasses and sedge species. <i>Aristida beyrichiana</i> , <i>Ctenium aromaticum</i> , <i>Rhexia alifanus</i> , <i>Rhynchospora</i> spp., and <i>Eriocaulon</i> spp. are typical species. Generally less than 10 trees/acre ( <i>Pinus palustris</i> or <i>Pinus elliottii</i> ) Occurs in western Florida and adjacent Alabama and Mississippi, examples occupy low, flat plains on poorly drained soils, saturated 50-100 days per year.....	<b>East Gulf Coastal Plain Savanna and Wet Prairie (2485)</b>
5b. Prairie or woodlands in open areas inland in Mississippi or Alabama.....	6
6a. Natural grassland vegetation and associated wooded vegetation (i.e. <i>Juniperus virginiana</i> , <i>Quercus stellata</i> , <i>Quercus muehlenbergii</i> ) in a relatively small natural region (an arc 300 miles long and 30 miles wide) of northwest Mississippi and western and central Alabama extending north to a small part of southern Tennessee (Black Belt Subsection 231Ba of Keys et al. 1995; Blackland Prairie Ecoregion 65a of Griffith et al. 2001). This area includes Selma, AL and Tupelo, MS .....	<b>East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland (2430)</b>
6b. Natural grassland vegetation and associated wooded vegetation in a relatively small natural region of Mississippi, the Jackson Hills Subsection (231Bj) (Keys et al. 1995) also called the Jackson Prairie Ecoregion (65r) of Omernik (EPA 2004). The most prominent tall grasses are <i>Andropogon gerardii</i> , <i>Schizachyrium scoparium</i> , <i>Sorghastrum nutans</i> , and <i>Panicum virgatum</i> . Additional tall grasses include <i>Tripsacum dactyloides</i> , <i>Andropogon glomeratus</i> , and <i>Paspalum floridanum</i> . Along with <i>Schizachyrium scoparium</i> , two other species provide over 50% cover in prairie openings; these are <i>Carex cherokeensis</i> and <i>Helenium autumnale</i> .....	<b>East Gulf Coastal Plain Jackson Prairie and Woodland (2433)</b>