Field Key to Ecological Systems of Map Zones 55 and 58, Atlantic Coastal Plain, United States

NatureServe
Terrestrial Ecology Department
April 2007

Cumberland Island National Seashore, Florida 2006. photo by Heather Summer

Contacts:
Pat Comer, Chief Terrestrial Ecologist, 703.797.4802, pat_comer@natureserve.org
Milo Pyne, SE US Regional Vegetation Ecologist, 919.484.7857, ext. 136, milo_pyne@natureserve.org

TABLE OF CONTENTS

Introduction

The following keys to NatureServe ecological systems cover the areas found in NLCD map zones 55 and 58 (Southeaster Coastal Plain and Eastern Coastal Plain). 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.

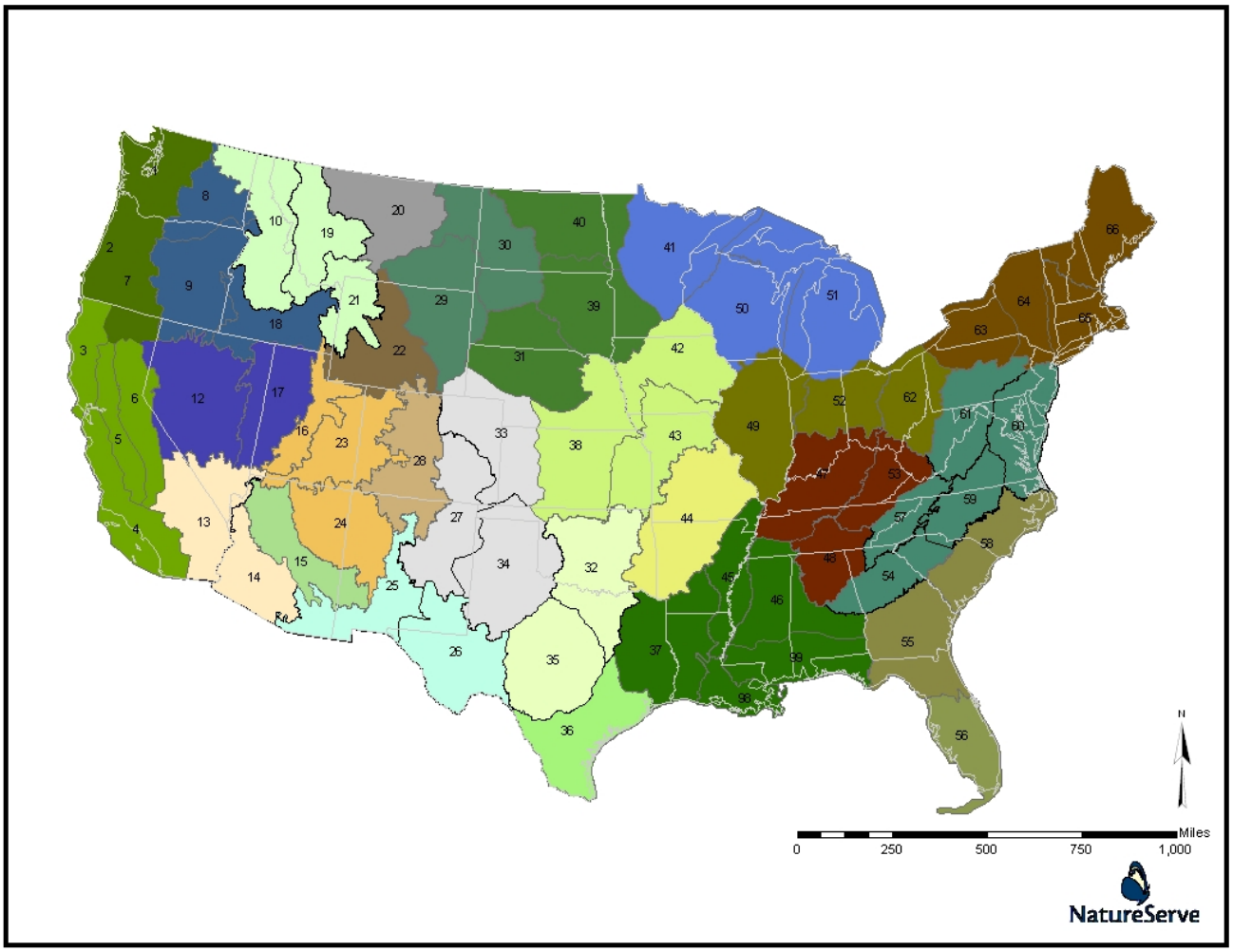

Figure 1. LANDFIRE map zone clusters with keys to ecological systems and selected alliances.

The keys to ecological systems use a variety of different varibles, 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) 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.

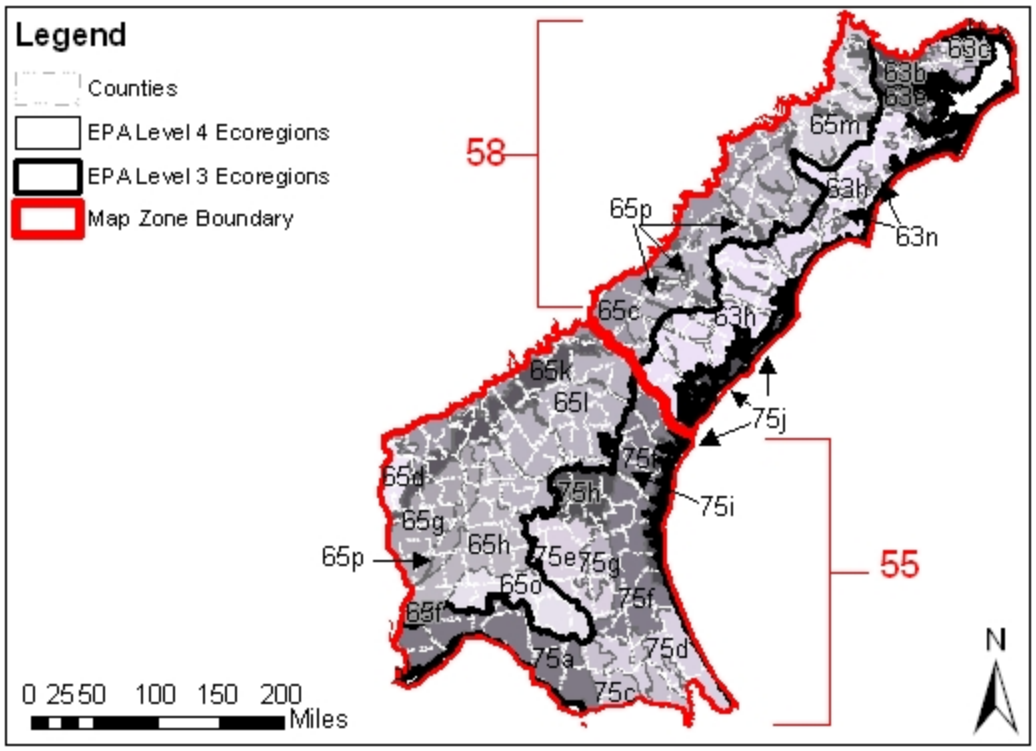

Figure 2 – EPA Level III and Level IV Ecoregions for Map Zones 55 and 58

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 to100% of the total cover.
Agriculture	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.
SEMI-NATURAL / ALTERED VEGETATION	
Ruderal Vegetation	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	
Introduced Vegetation	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 (including .
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 *Elaeagnus angustifolia, Triadica sebifera,* etc.
Introduced Wetland Vegetation	Land cover is altered/disturbed and dominated by introduced wetland vegetation. Species may include *Lythrum salicaria, Phalaris arundinacea, Phragmites australis*, etc.
Modified/Managed Vegetation	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 55 and 58 Ecological Systems (and Target Alliances)

This key is intended to aid in the identification of Ecological Systems and selected alliances that are found in the Southeastern and Eastern Coastal Plains (NLCD Map Zones 55 and 58), which covers the Gulf and Atlantic Coastal Plains in Florida, Georgia, and the two Carolinas north of about 29° N latitude. Additional alliance couplets are to proposed mappable or target alliances and are not intended to be comprehensive.

Please note the following symbols:

***** indicates NatureServe ecological system that has been grouped into broader LANDFIRE Map Unit. Included to help clarify key, but crews need to record broader LANDFIRE Map Unit(**)

****** indicates broader LANDFIRE Map Unit.

******* indicates small patch ecological system, NOT being mapped by LANDFIRE and included for completeness of the key.

******** This alliance is not considered mappable, but is included as a counter-point to one that is mappable.

Forested Ecological Systems (greater than 10% tree cover)

1a. Forested Ecological System, stands typically dominated by trees (at greater than 10% cover) 2

1b. Non-forested Ecological System, stands with trees typically absent or at low cover (below 10%) 40

2a. Stands typically dominated by needle-leaved trees (evergreen or deciduous) 3

2b. Examples typically dominated by broad-leaved trees (temperate evergreen and/or deciduous) 20

3a. Examples (upland or wetland) dominated by needle-leaved evergreen trees (e.g. Pines, Pinus spp.; or wetlands dominated by Chamaecyparis thyoides) 4

3b. Wetland stands dominated by needle-leaved deciduous trees (e.g. *Taxodium spp.*) 19

4a. Wetlands (stands whose flora and ecological dynamics are affected by saturated soil conditions), dominated by either Pines (*Pinus spp*.) or by *Chamaecyparis thyoides* 5

4b. Upland Pine stands (understory and herb composition is not affected by saturated soil conditions) 11

5a. Wetlands dominated by *Chamaecyparis thyoides*; examples are located on saturated soils with organic matter (e.g. streamheads and streamsides) as well as nonriverine flats found on organic soils; these are *Chamaecyparis*-dominated stands of Ecological Systems more typically dominated or co-dominated by temperate broad-leaved evergreen trees and shrubs (e.g. *Magnolia virginiana, Gordonia Lasianthus, Persea palustris, Cliftonia monophylla, Lyonia lucida*, etc., with some deciduous trees (e.g. *Acer rubrum, Nyssa biflora*, etc.) 6

5b. Wetlands dominated by Pines (stands whose understory and herb composition is affected by saturated soil conditions), e.g. wetter pine flatwoods, dominated by either Longleaf Pine (*Pinus palustris*) or Slash Pine (*Pinus elliottii var. elliottii*), possibly by Pond Pine (*Pinus serotina*), found in flat mesic to saturated landscapes (some mesic examples of this system may key out in Uplands, the boundary between upland and wetland being somewhat obscure in this landscape) 8

6a. Examples located on nonriverine flats, not associated with overbank flooding (the compositional diversity of this Ecological System accommodates examples dominated by wet hardwoods, as well as *Taxodium distichum*, in addition to the *Chamaecyparis*-dominated stands accounted for here) – **Central Atlantic Coastal Plain Nonriverine Swamp and Wet Hardwood Forest (2501)**

6b. Examples located on saturated soils with organic matter, in streamheads or on streamsides, associated with linear features (streams and watercourses), which may receive overbank flooding in addition to groundwater inputs 7

7a. Examples located in the East Gulf Coastal Plain, Florida Peninsula and southern Atlantic Coastal Plain north to about the latitude of Savannah, Georgia, including the Sea Island Flatwoods (EPA 75f) and Bacon Terraces (EPA 75h) - *Chamaecyparis*-dominated examples of **Southern Coastal Plain Seepage Swamp and Baygall (2461)**

7b. Examples located in the Atlantic Coastal Plain south to about the latitude of Savannah, Georgia, and including the Atlantic Southern Loam Plains (EPA 65l) – *Chamaecyparis*-dominated examples of **Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall (2468)**

8a. Examples located in the Atlantic Coastal Plain, from Clay and Duval Counties, Florida, north to the latitude of Norfolk, Virginia 9

8b. Examples located south and west of this range in the Gulf Coast Flatwoods Ecoregion (EPA 75a) and the northern Florida Peninsula (EPA 75b, 75c, 75d) 10

9a. Examples located in a region extending from the latitude of Norfolk, Virginia, south to the Congaree/Santee Rivers in South Carolina Northern two-thirds of EPA 63h, adjacent portions of EPA 65, etc.), generally not containing

Pinus elliottii, or only at low cover at the southern end of its range - **Central Atlantic Coastal Plain Wet Longleaf Pine Savanna and Flatwoods (2449)**

9b. Examples located in a region extending from the Congaree/Santee Rivers in South Carolina, south to, and including Clay and Duval counties, Florida and the city of Jacksonville (EPA Ecoregions 75f, 75j, and southern third of 63h, etc.), stands likely to contain Slash Pine (*Pinus elliottii*)i – **Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods (2450)**

10a. Examples located in the Gulf Coast Flatwoods Ecoregion (EPA 75a); this is presumed to be the predominant type of Longleaf and Slash Pine-dominated vegetation in this EPA Level IV Ecoregion – **East Gulf Coastal Plain Near-Coast Pine Flatwoods (2454)**

10b. Examples located in the northern Florida Peninsula (EPA 75b, 75c, 75d) – wet, saturated phase of **Central Florida Pine Flatwoods (2453)**

11a. Examples consisting of monospecific stands of Loblolly Pine (*Pinus taeda*), presumably arising from primary succession on abandoned cropland or farmland, or from abandonment of plantations of this species, possibly with successional fire-intolerant hardwoods (*Acer rubrum, Liquidambar, Liriodendron, Quercus hemisphaerica, Quercus nigra*) in the subcanopy or at low values in the canopy – ***Pinus taeda* Forest Alliance (A.130)**

11b. Examples not overwhelmingly dominated by Loblolly Pine (*Pinus taeda*), instead with canopies consisting of other native Pines (e.g. Longleaf Pine, Sand Pine), possibly mixed with oaks in the canopy or subcanopy [in these map zones, there is not an ecological system which is characterized by Shortleaf Pine (*Pinus echinata*). If this species is encountered as a dominant in a stand, then the area sampled may be too small, and/or other indicator species may need to considered as diagnostic for the stand or sample] 12

12a. Examples containing Sand Pine (*Pinus clausa*), from low to high densities (some stands with canopy closure greater than 60%), shrub understory dominated by oaks (e.g. *Quercus myrtifolia, Quercus inopina, Quercus geminata, Quercus chapmanii*) with *Serenoa repens* – Sand Pine-dominated examples of **Florida Peninsula Inland Scrub (2387)**

12b. Examples containing or dominated by Longleaf Pine; typically woodlands with canopy closure less than 60%; some stands (in sandhills) may contain an understory of "scrub oaks" (e.g. *Quercus laevis, Quercus margarettiae, Quercus incana*) 13

13a. Longleaf Pine stands found on extensive Sandhills, particularly in the Fall-line Sandhills of NC, SC, GA (EPA Ecoregion 65c); in the Lake Wales or Central Florida Ridge (EPA Ecoregion 75c); or in other extensive areas of deep, coarse, sandy soil (as at Eglin Air Force Base, Florida); these are large areas where Sandhills are the predominant land type over extensive areas, and Longleaf Pine Woodland is the predominant natural vegetation type, occurring as the vegetation matrix; some stands may have an understory of "scrub oaks" (e.g. *Quercus laevis, Quercus margarettiae, Quercus incana*); [if stands are dominated by these oaks, they will key out under deciduous as a deciduous "phase" of this system] 14

13b. Longleaf Pine stands, possibly mixed with oaks (not scrub oaks), occurring in environments other than extensive areas of sandhills 15

14a. Sandhill Longleaf Pine stands found in the Fall-line Sandhills of NC, SC, GA (EPA Ecoregion 65c) – **Atlantic Coastal Plain Fall-line Sandhills Longleaf Pine Woodland (2346)**

14b. Sandhill Longleaf Pine stands found in Florida, in the Lake Wales or Central Florida Ridge (EPA Ecoregion 75c); or in other extensive areas of deep, coarse, sandy soil (as at Eglin Air Force Base, Florida) - **Florida Longleaf Pine Sandhill (2356)**

15b. Upland Mesic Pine stands found in flat mesic landscapes (wetter examples of these systems may key out in Wetlands, the boundary between upland and wetland being somewhat obscure in these landscapes) 16

15b. Upland Pine stands of a variety of moisture classes and soil textures (neither specifically flatwoods nor extensive sandhills), ranging in composition from pure Longleaf Pine stands (typically at or below 60% cover if properly managed) to mixed Longleaf Pine-Oak stands, possibly over 60% without fire management 18

16a. Examples located in the northern Florida Peninsula (EPA 75b, 75c, 75d); Dry to mesic Pine flatwoods, dominated by either Longleaf Pine (*Pinus palustris*) or Slash Pine (*Pinus elliottii var. elliottii*), in flat landscapes, not on deep sands of Sandhills – upland phase of **Central Florida Pine Flatwoods (2453)**, including "Scrubby Flatwoods", possibly with Sand Pine (*Pinus clausa*)

16b. Examples located north and east of this range, in the Atlantic Coastal Plain, from Clay and Duval Counties, Florida, north to the latitude of Norfolk, Virginia 17

17a. Examples located in a region extending from the latitude of Norfolk, Virginia, south to the Congaree/Santee Rivers in South Carolina Northern two-thirds of EPA 63h, adjacent portions of EPA 65, etc.), generally not containing Slash Pine (*Pinus elliottii*), or only at low cover at the southern end of its range – mesic phase of **Central Atlantic Coastal Plain Wet Longleaf Pine Savanna and Flatwoods (2449)**

17b. Examples located in a region extending from the Congaree/Santee Rivers in South Carolina, south to, and including Clay and Duval counties, Florida and the city of Jacksonville (EPA Ecoregions 75f, 75j, and southern third of 63h, etc.), stands likely to contain Slash Pine (*Pinus elliottii*) – mesic phase of **Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods (2450)**

18a. Examples located in the Atlantic Coastal Plain (e.g. EPA 65k [northeastern portion, including the Ocmulgee River watershed], 65l, 75f, 75h, and regions to the north and east) - **Atlantic Coastal Plain Upland Longleaf Pine Woodland (2347)**

18b. Examples located in the East Gulf Coastal Plain (e.g. EPA 65d, 65f, 65g, 65h, 65k [southwestern portion, including the Flint River watershed and tributaries] 65o) – **East Gulf Coastal Plain Interior Upland Longleaf Pine Woodland (2349)**

19a. Examples consisting of moderately dense to dense stands of *Taxodium spp.* in isolated depressional wetlands, varying in size and shape, the trees being taller in the center of the wetland, giving a "domed" appearance when viewed from the side - **Southern Coastal Plain Nonriverine Cypress Dome (2460)**

19b. Examples consisting of open to sparse stands of *Taxodium spp*. in unique oval depressions (oriented northwest-southeast with a characteristic "sand rim" on the southeastern side, called "Carolina Bays"), these with the tallest trees not necessarily in the center of the wetland, but more-or-less randomly arranged; found from southeastern North Carolina to eastern Georgia – **Atlantic Coastal Plain Clay-Based Carolina Bay Wetland (2459)**

20a. Uplands (stands whose composition is not affected by flooding or saturated soil conditions)..... 21

20b. Wetlands (stands whose composition is affected by flooding or saturated soil conditions; including floodplains and bottomlands as well as seepage forests on organic soils and nonriverine wet hardwood forests on organic or mineral soils) 33

21a. Stands typically dominated by temperate evergreen broad-leaved trees, typically dominated by or at least containing Live Oak (*Quercus virginiana*), Sand Live Oak (*Quercus geminata*), and/or other evergreen or semi-evergreen oaks, possibly with pine in earlier-successional examples..... 22

21b. Stands typically dominated by deciduous broad-leaved trees 25

22a. Stands found inland as well as near the coast, but without influence from wind and salt spray, Ecological System a small patch type embedded in a matrix of fire-prone Pine-dominated system, present throughout the map zone in appropriate environments - **Southern Coastal Plain Oak Dome and Hammock (CES203.494)***** [not part of Landfire legend]

22b. Stands found in a near-coastal environments, typically with some influence from wind and salt spray..... 23

23a. Examples on the Gulf Coast - Forested examples of **East Gulf Coastal Plain Maritime Forest (2380)**

23b. Examples on the Atlantic Coast 24

24a. Examples found in the "Sea Islands" from Charleston, SC and south to Volusia County, Florida – Forested examples of **Southern Atlantic Coastal Plain Maritime Forest (2382)**

24b. Examples found on "Barrier Islands" from Virginia Beach south to Charleston, SC - Forested examples of Central **Atlantic Coastal Plain Maritime Forest (2361)**

25a. Stands of "mesic" moisture and corresponding composition, with American Beech (*Fagus grandifolia*) characteristic, often co-dominant with members of a suite of "mesic" Oaks (e.g. *Quercus alba, Quercus pagoda*, etc.) along with *Liquidambar styraciflua* and/or other hardwoods, including Southern Magnolia (*Magnolia grandiflora*) and Spruce Pine (*Pinus glabra*) to the south within their ranges, and Loblolly Pine (*Pinus taeda*) ... 26

25b. Stands ranging from "dry" to "dry-mesic" in moisture status, with corresponding variability in species composition; "dry" examples typically on sandy soils, stands dominated by "scrub oaks" (*Quercus laevis, Quercus margarettiae, Quercus incana*), a large patch type most likely found in areas where Longleaf Pine was dominant but has been removed and/or failed to regenerate; "dry-mesic" examples dominated by members of a suite of "dry-mesic" Oaks (e.g. *Quercus alba, Quercus stellata, Quercus falcata,* etc.) along with Shortleaf Pine in some examples; some limited base-rich examples contain *Quercus muehlenbergii, Quercus pagoda, Quercus shumardii, Celtis spp., Carya spp., Ulmus spp., Fraxinus americana*; system of somewhat limited extent, typically found on upper slopes or other somewhat fire-sheltered habitats 27

26a. Stands located north of a line approximately from Columbus, Georgia to Georgetown, South Carolina, north of the range of Southern Magnolia (*Magnolia grandiflora*) and Spruce Pine (*Pinus glabra*), stands not containing these species – **Atlantic Coastal Plain Mesic Hardwood Forest (2343)**

26b. Stands located south of a line approximately from Columbus, Georgia to Georgetown, South Carolina, within the range of Southern Magnolia (*Magnolia grandiflora*) and Spruce Pine (*Pinus glabra*), stands typically containing one or both of these species – **Southern Atlantic Coastal Plain Mesic Slope Forest (2357)**

27a. Examples are of "dry" moisture status and composition, being dominated by "scrub oaks" (*Quercus laevis, Quercus margarettiae, Quercus incana*), most likely found in areas where Longleaf Pine was dominant but has been removed and/or failed to regenerate 28

27b. Examples are of "dry-mesic" moisture status and corresponding species composition, dominated by members of a suite of "dry-mesic" Oaks (e.g. *Quercus alba, Quercus stellata, Quercus falcata*, etc.) along with Shortleaf Pine in some examples; some limited base-rich examples contain *Quercus muehlenbergii, Quercus pagoda, Quercus shumardii, Celtis spp., Carya spp., Ulmus spp., Fraxinus americana*; system of somewhat limited extent, typically found on upper slopes or other somewhat fire-sheltered habitats 31

28a. Examples found on extensive Sandhills, particularly in the Fall-line Sandhills of NC, SC, GA (EPA Ecoregion 65c); in the Lake Wales or Central Florida Ridge (EPA Ecoregion 75c); or in other extensive areas of deep, coarse, sandy soil (as at Eglin Air Force Base, Florida); these are large areas where Sandhills are the predominant land type over extensive areas, and Longleaf Pine Woodland is the predominant natural vegetation type 29

28b. Examples occurring in environments other than extensive areas of sandhills (including small, local patches of sandy soils located outside of extensive "sandhills" regions) 30

29a. Examples found in the Fall-line Sandhills of NC, SC, GA (EPA Ecoregion 65c) – scrub oak-dominated examples of **Atlantic Coastal Plain Fall-line Sandhills Longleaf Pine Woodland (2346)**

29b. Examples found in Florida, in the Lake Wales or Central Florida Ridge (EPA Ecoregion 75c); or in other extensive areas of deep, coarse, sandy soil (as at Eglin Air Force Base, Florida) - scrub oak-dominated examples of **Florida Longleaf Pine Sandhill (2356)**

30a. Examples located in the Atlantic Coastal Plain (e.g. EPA 65k [northeastern portion, including the Ocmulgee River watershed], 65l, 75f, 75h, and regions to the north and east) – dry, scrub oak-dominated examples of **Atlantic Coastal Plain Upland Longleaf Pine Woodland (2347)**

30b. Examples located in the East Gulf Coastal Plain (e.g. EPA 65d, 65f, 65g, 65h, 65k [southwestern portion, including the Flint River watershed and tributaries] 65o) – dry, scrub oak-dominated examples of **East Gulf Coastal Plain Interior Upland Longleaf Pine Woodland (2349)**

31a. Examples found on limited areas of "marl", limestone-derived soils, or other base-rich and/or circumneutral substrates, typically with *Quercus muehlenbergii, Quercus pagoda, Quercus shumardii, Celtis spp., Carya spp., Ulmus spp., Fraxinus americana* as components; *Juniperus virginiana* present in some stands (or dominant in early-successional ones) – **East Gulf Coastal Plain Limestone Forest (2328)**

31b. Examples not found on "marl", limestone-derived soils, or other base-rich and/or circumneutral substrates, later-seral stands dominated by members of a suite of "dry-mesic" Oaks (e.g. *Quercus alba, Quercus stellata, Quercus falcata*, etc.) along with Hickories and Shortleaf Pine (*Pinus echinata*) in some examples [there will be issues of classification and discernment between "legitimate" examples of the dry or dry-mesic hardwood systems, which are of limited extent in the region, and areas formerly occupied by Longleaf Pine which are currently occupied by hardwoods due to extirpation of Longleaf Pine] 32

32a. Stands found in the East Gulf Coastal Plain (e.g. EPA 65d, 65f, 65g, 65h, 65k [southwestern portion, including the Flint River watershed and tributaries] 65o) and Florida Peninsula - **Southern Coastal Plain Dry Upland Hardwood Forest (2330)**

32b. Stands found in the Atlantic Coastal Plain (e.g. EPA 65k [northeastern portion, including the Ocmulgee River watershed], 65l, 75f, 75h, and regions to the north and east) - **Atlantic Coastal Plain Dry and Dry-Mesic Oak Forest (2335)**

33a. Examples with canopies dominated or co-dominated by temperate broad-leaved evergreen trees (e.g. *Magnolia virginiana, Gordonia lasianthus*, etc.); typically seepage forests with organic matter in their soils whose composition is affected by saturated soil conditions 34

33b. Examples typically dominated or co-dominated by temperate broad-leaved deciduous trees and shrubs (e.g. wetland *Quercus spp., Liquidambar styraciflua, Nyssa spp., Fraxinus pennsylvanica*, etc.); typically found along streams, creeks and rivers and in their floodplains (on poorly drained mineral soils) whose structure and composition is affected by temporary, seasonal, or tidal flooding 38

34a. Examples found on poorly drained, organic or mineral soil nonriverine flats of the outer Atlantic Coastal Plain; these areas are saturated by rainfall and seasonal high water tables (at or slightly above the soil surface) without influence of river or tidal flooding, less frequently with standing water – hardwood dominated examples of **Central Atlantic Coastal Plain Nonriverine Swamp and Wet Hardwood Forest (2501)**

34b. Examples found on saturated soils with organic matter (e.g. streamheads and streamsides as well as nonriverine basins, these typically with standing water); typically dominated or co-dominated by temperate broad-leaved evergreen "bay" trees and shrubs (e.g. *Magnolia virginiana, Gordonia lasianthus, Persea palustris, Cliftonia*

monophylla, Lyonia lucida, etc., with some deciduous trees (e.g. *Acer rubrum, Nyssa biflora*, etc.), possibly with *Arundinaria gigantea ssp. tecta* (cane)..... 35

35a. Examples located in streamheads or on streamsides, associated with linear features (streams and watercourses), which may receive overbank flooding in addition to groundwater inputs..... 36

35b. Examples located in nonriverine basins, not receiving overbank flooding; generally forested, emergent Pines (*Pinus ssp*.) or Bald-cypress (*Taxodium distichum*) may also be present..... 37

36a. Examples located in the East Gulf Coastal Plain, Florida Peninsula and southern Atlantic Coastal Plain north to about the latitude of Savannah, Georgia, including the Sea Island Flatwoods (EPA 75f) and Bacon Terraces (EPA 75h) - **Southern Coastal Plain Seepage Swamp and Baygall (2461)**

36b. Examples located in the Atlantic Coastal Plain south to about the latitude of Savannah, Georgia, and including the Atlantic Southern Loam Plains (EPA 65l) – **Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall (2468)**

37a. Examples located in Atlantic Coastal Plain of NC, SC, GA; in extensive areas of soils with large organic (peat) fraction (Histosols); most prevalent and likely to be found in EPA 63c "Swamps and Peatlands"; manifesting as a variety of physiognomies depending on fire return interval; shrub layer may be dominated by a mixture of tall to short evergreen trees/shrubs shrubs (*Magnolia virginiana, Gordonia lasianthus, Cliftonia monophylla, Cyrilla racemiflora, Lyonia lucida*) and *Smilax laurifolia*, possibly with cane (*Arundinaria gigantea ssp. tecta*); emergent pines (*Pinus serotina, Pinus taeda*) may be present or not; some stands may contain or have patch dominance by *Arundinaria gigantea ssp. tecta* without other species present (Canebrakes), this latter phase is now rare on the present landscape - **Atlantic Coastal Plain Peatland Pocosin and Canebrake (2452)**

37b. Examples located in isolated basins in an upland landscape, not in extensive histosol landscapes; generally forested, with Taxodium distichum, Nyssa biflora, evergreen "bay" shrubs (*Cliftonia monophylla, Cyrilla racemiflora, Lyonia lucida*) and *Smilax laurifolia*. Emergent Pines (particularly Slash Pine, *Pinus elliottii*) or Bald-cypress (*Taxodium distichum*) may also be present - **Southern Coastal Plain Nonriverine Basin Swamp*** [a Non-tidal example of **Gulf and Atlantic Coastal Plain Swamp Systems (2480)****]

38a. Stands along tidal rivers and creeks, subject to regular daily lunar tidal flooding – Tidal examples of **Gulf and Atlantic Coastal Plain Swamp Systems (2480)**** [includes Tidal Swamps]

38b. Stands along inland rivers and creeks, subject to temporary or seasonal flooding..... 39

39a. Forested vegetation (rarely non-forested shrub and herbaceous patches) found along rivers, with substantial development of floodplain morphological features (point bars, backswamps, terraces) - **Gulf and Atlantic Coastal Plain Floodplain Systems (2473)****; may be difficult to distinguish from 2474 below in the field and require interpretation from aerial photos or field maps

39b. Forested vegetation (rarely non-forested shrub and herbaceous patches) found along streams, without substantial development of floodplain morphological features (point bars, backswamps, terraces) **Gulf and Atlantic Coastal Plain Small Stream Riparian Systems (2474)****; may be difficult to distinguish from 2473 above in the field and require interpretation from aerial photos or field maps

Non-forested Ecological Systems (less than 10% tree cover)

40a. Uplands (e.g. dune grasslands and shrublands, , dry prairies, Florida limestone glade, some examples of scrub) 41

40b. Wetlands (including pond margins, marshes, sloughs, wet prairies, and wet depressions)..... 49

41a. Ecological System consists of sparsely vegetated beach, a narrow strip found between the dunes and daily high tide line (e.g. the outermost zone of coastal vegetation extending seaward from foredunes on barrier islands and also limited overwash flats behind breached foredunes); found in near-coastal parts of Middle Atlantic Coastal Plain and Southern Coastal Plain (EPA Ecoregions 63 and 75); **Gulf and Atlantic Coastal Plain Sparsely Vegetated Systems (2498)****

41b. Ecological System variously vegetated, not sparsely vegetated beach..... 42

42a. Ecological System restricted to areas adjacent to seacoast, its vegetation composition and structure affected by coastal processes (e.g. dune migration, storm disruption of substrate, salt spray and wind effects)..... 43

42b. Ecological System found inland, not restricted to areas adjacent to seacoast, its vegetation composition and structure not affected by coastal processes..... 47

43a. Stands typically dominated by shrubs (possibly with sparse and/or stunted, wind-sculpted trees)..... 44

43b. Stands typically dominated by dune grasses (e.g. *Uniola paniculata*) or other grasses and/or graminoids (*Spartina, Fuirena,* etc.); shrubs may occur in patches but do not dominate..... 46

44a. Examples on the Gulf Coast – Shrub-dominated examples of **East Gulf Coastal Plain Maritime Forest (2380)**

44b. Examples on the Atlantic Coast..... 45

45a. Examples found in the "Sea Islands" from Charleston, SC and south to Volusia County, Florida – Shrub-dominated examples of **Southern Atlantic Coastal Plain Maritime Forest (2382)**

45b. Examples found on "Barrier Islands" from Virginia Beach south to Charleston, SC - Shrub-dominated examples of **Central Atlantic Coastal Plain Maritime Forest (2361)**

46a. Examples found on Gulf Coast – **East Gulf Coastal plain Dune and Coastal Grassland (2431)**

46b. Examples found on Atlantic Coast - **Southern Atlantic Coastal Plain Dune and Maritime Grassland (2426)**

47a. System found in the Panhandle of Florida, (Jackson County), on limestone outcrops on hillsides and hill crests where soils are shallow to non-existent – **Panhandle Florida Limestone Glade (2406)**

47b. System found on sandy substrates, not on limestone 48

48. Examples found on inland sand dunes of the Coastal Plain of Georgia; dunes associated with certain rivers such as the Ohoopee and Canoochee; some stands with scattered *Pinus palustris*, with characteristic suite of shrubs including *(Quercus myrtifolia, Quercus geminata, Hamamelis virginiana, Elliottia racemosa, Ceratiola ericoides, Chrysoma pauciflosculosa, Clinopodium coccineum)* – **Atlantic Coastal Plain Xeric River Dune (2388)**

48a. Examples found in Central Florida Ridge (or Lake Wales Ridge (EPA Level IV region 75c), dominated by shrubs including scrub Oaks (e.g. *Quercus geminata, Quercus myrtifolia, Quercus chapmanii*) and *Ceratiola ericoides* - Shrub-dominated examples of **Florida Peninsula Inland Scrub (2387)**

49a Examples typically dominated by mesic to wet grasses, graminoids, and forbs, including *Aristida beyrichiana, Carphephorus pseudoliatris, Fuirena scirpoidea, Rhynchospora cephalantha, Rhynchospora chapmanii, Rhynchospora corniculata, Rhynchospora harperi, Rhynchospora oligantha, Pleea tenuifolia, Polygala cymosa, Sarracenia alata, Sarracenia flava, Sarracenia leucophylla, Sarracenia psittacina, Scleria baldwinii, Verbesina chapmanii* possibly with shrubs including *Hypericum fasciculatum* and *Nyssa ursina*; "wet prairie" vegetation on saturated soils, found in near-coastal areas of the Gulf Coast region – **East Gulf Coastal Plain Savanna and Wet Prairie (2485)**

49b. Examples dominated by "marsh grasses" – grasses and graminoids which tolerate either extended periods of inundation or high salinity 50

50a. Examples found along tidal rivers and creeks, subject to diurnal tidal flooding, including both haline (saline) and oligohaline (fresh) marshes, including *Juncus roemerianus, Spartina patens, Spartina alternifolia* - **Gulf and Atlantic Coastal Plain Tidal Marsh Systems (2490)****

50b. Examples found in other situations, primarily margins of ponds and lakes, as well as other environments not directly connected with tidal rivers and creeks 51

51a. Examples found in as former lake basins, shallow peat-filled valleys, and zones around existing natural lakes, subject to prolonged inundation; stands typically consist of dense stands of emergent herbaceous perennials, often in monospecific stands; species include *Typha latifolia, Pontederia cordata, Nelumbo lutea*, and others; some zones have more graminoid vegetation, with species such as *Panicum hemitomon, Leersia hexandra*, and others - **Floridian Highlands Freshwater Marsh (2489)**

51b. Examples found around margins of smaller ponds, or as zones within these ponds – these pondshore communities occur at too small a scale to be considered Legend Items for Landfire and are classified by their biogeography: Central Florida Herbaceous Pondshore***, East Gulf Coastal Plain Depression Pondshore***, East Gulf Coastal Plain Sandhill Lakeshore Depression***, Southern Coastal Plain Depression Pondshore***, Southeastern Coastal Plain Natural Lakeshore***