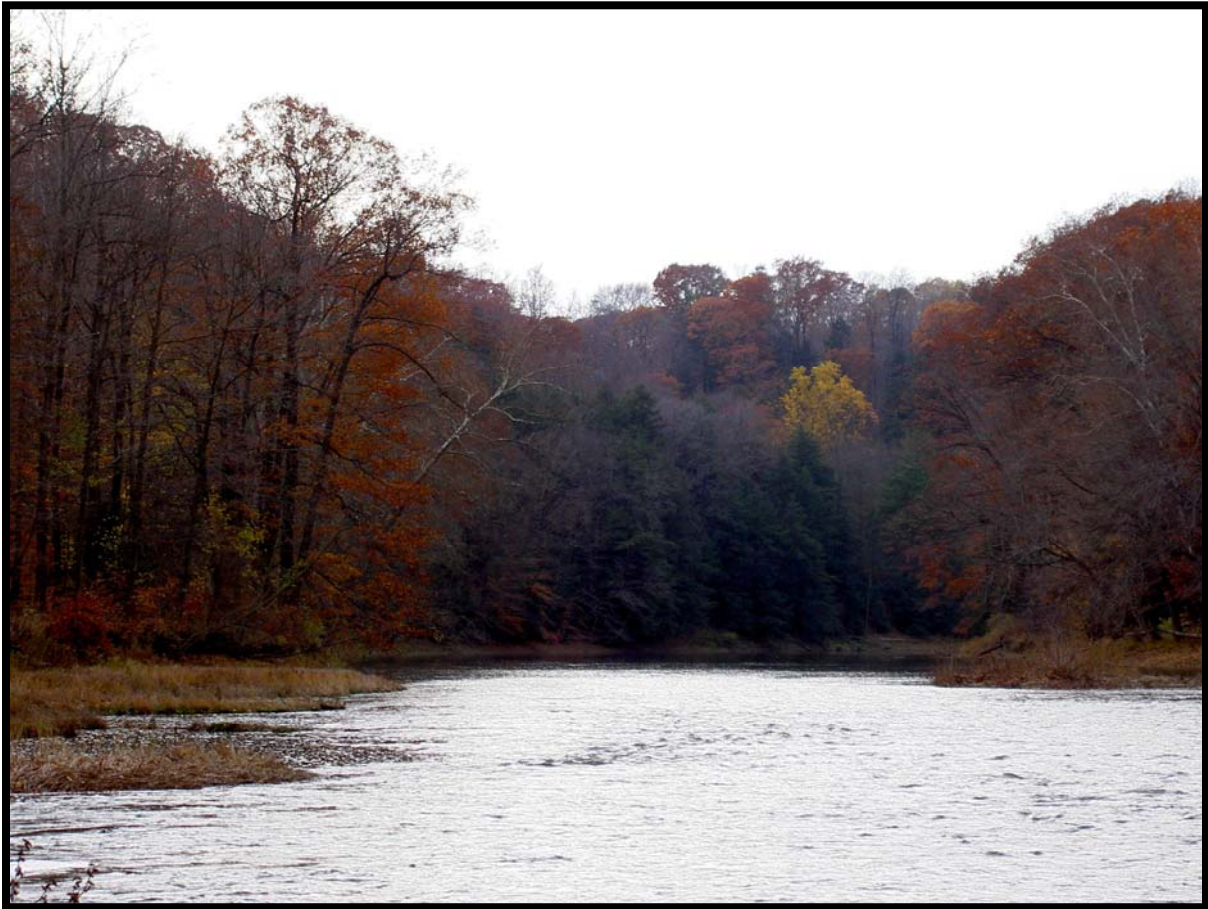


**Field Key to Ecological Systems and Target Alliances
of the Map Zones 49, 52, 62 (Eastern Till Plains), United States**

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Introduction

The following keys to NatureServe ecological systems cover the areas found in NLCD map zones 49, 52, 62 (Eastern Till Plains). 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 in the keys 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 two 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 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 strobus* Forest Alliance).

Systems do not include Latin species names in them, and always start with a Biogeographic region (e.g. North-Central Interior or Laurentian-Acadian), 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.

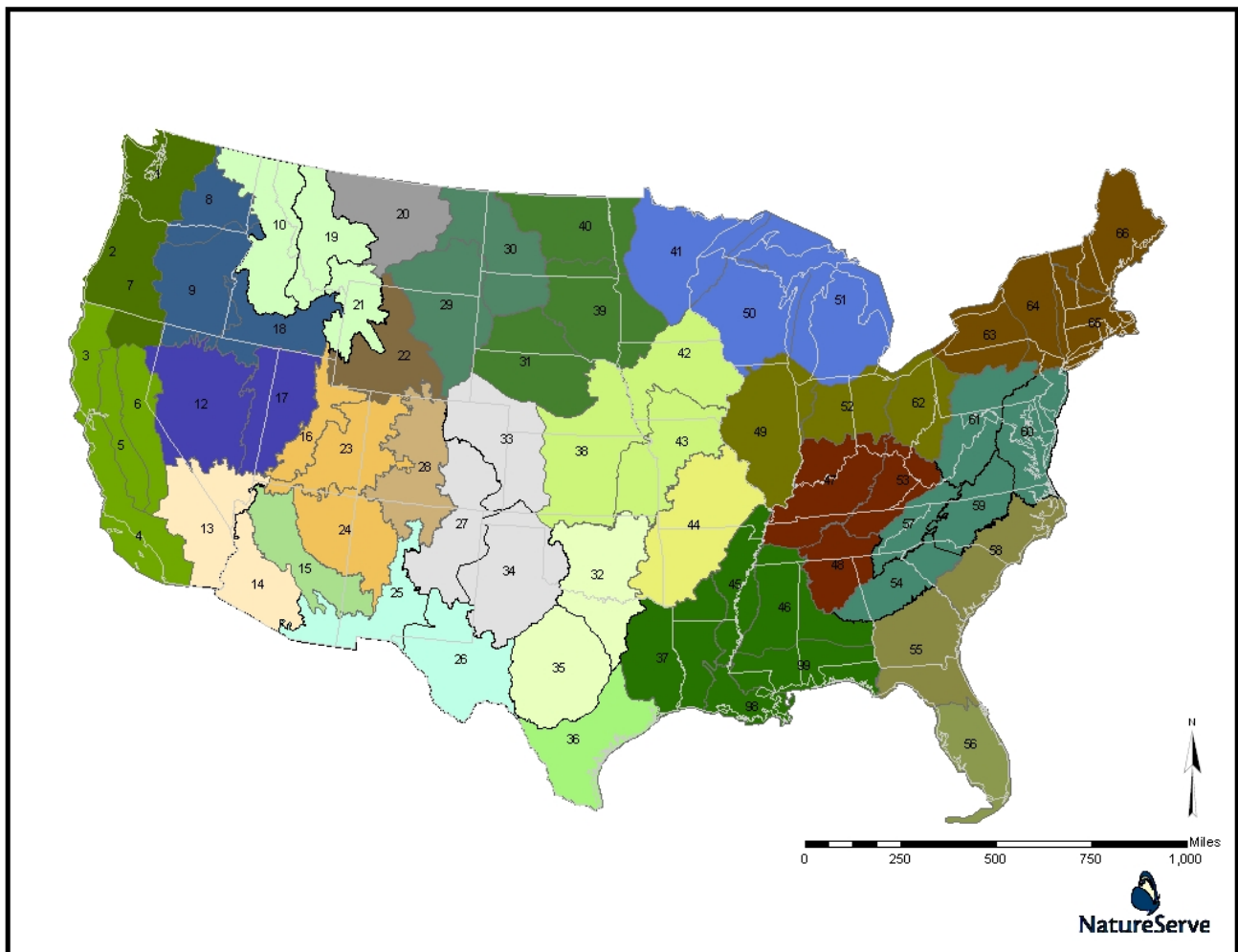


Figure 1. LANDFIRE map zone clusters with keys to ecological systems and selected alliances.

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 “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 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 or alliance will have two 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 Eastern Till Plains, elevation is of some use in distinguishing systems, but soil composition or latitude are of more importance across the entire area. 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 USFS Section and Subsection boundaries, 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.

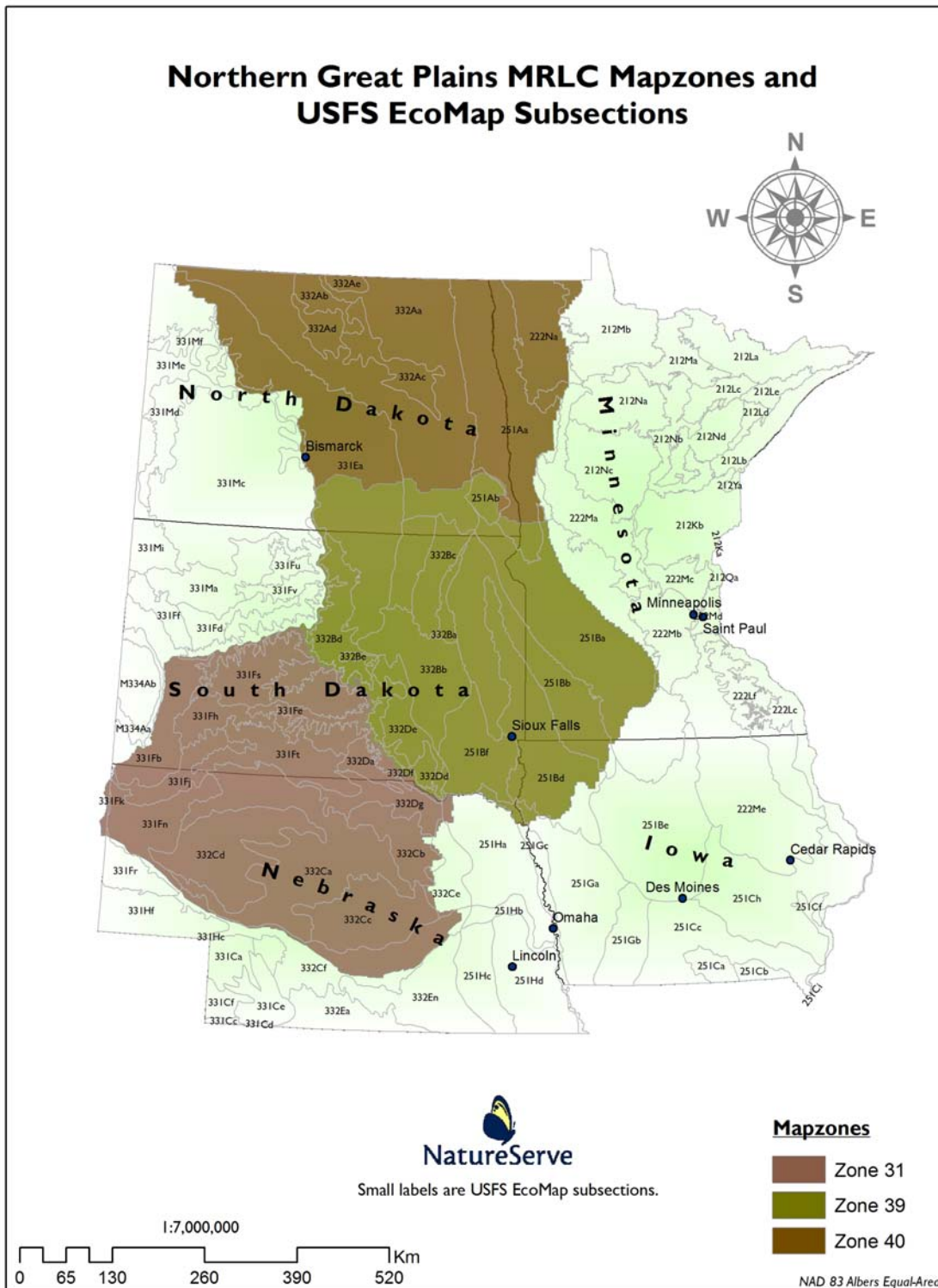


Figure 2 – USFS Subsections for Map Zones 49, 52, and 62.

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.
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.
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.
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.

Key to Map Zones 49, 52, 62 Ecological Systems

This key is intended for identifying Ecological Systems and selected alliances that are found in the Eastern Till Plains (NLCD Map Zones 49, 52, 62), which covers most of Illinois, northern Indiana, northern and central Ohio, extreme western Pennsylvania, and northwestern West Virginia.

Please note the following symbols:

* indicates NS 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.

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

KEY TO GROUPS

- 1a. Trees and shrubs forming uppermost layer, woody canopy cover in that layer 10% or more2
- 1b. Total woody cover in the uppermost stratum less than 10-15%; though total woody cover may be greater; uppermost vegetation stratum strongly herbaceous3

- 2a. Upland forests, woodlands, and shrublands (stands whose composition is not affected by flooding or saturated soil conditions) **Key A**
- 2b. Wetland forests, woodlands, and shrublands (stands whose composition is affected by flooding or saturated soil conditions; including floodplains and bottomlands as well as seepage forests) **Key B**

- 3a. Total canopy cover (herbaceous) >10%, some woody species may be present4
- 3b. Total canopy cover (woody and herbaceous vascular plants) generally less than 10% **Key E**

- 4a. Uplands (e.g. prairies, some examples of scrub) **Key C**
- 4b. Wetlands (including pond margins, marshes, sloughs, and wet depressions) **Key D**

KEY A – FOREST AND WOODLAND SYSTEMS (>10% tree cover)

- 1a. System on dunes and swales or bedrock pavement adjacent to the Great Lakes2
- 1b. System not on dunes and swales or exposed bedrock adjacent to Great Lakes3

- 2a. System on dunes and swales; characterized by a mixture of shrub areas (*Prunus pumila*, *Juniperus* spp.) and woodlands/forests (*Pinus* spp., *Populus deltoides*); swales may be wet with species such as *Cladium mariscoides*, *Dasiphora fruticosa*, and *Juncus balticus* **Great Lakes Dune and Swale (2466)**
- 2b. System on bedrock pavement of limestone or dolostone; rare; occurs only in northwestern Ohio (in MZ49, 52, 62) **Great Lakes Alvar (2409)**

3a. Systems with >25% tree cover.....	4
3b. Systems with <25% tree cover.....	20
4a. Systems dominated by <i>Quercus</i> spp.	5
4b. Systems not dominated by <i>Quercus</i> spp.	16
5a. Soils shallow with exposed bedrock common, canopy cover open to moderately closed.....	6
5b. Soils deep to moderately shallow, exposed bedrock not prominent on the landscape	9
6a. Bedrock is sandstone, chert, acidic granite, or igneous	7
6b. Bedrock is limestone, dolomite, or other calcareous rock	8
7a. System in Provinces 211, 221, or M221; <i>Quercus prinus</i> is common in the overstory; <i>Pinus</i> spp. often present to abundant	Central Appalachian Pine-Oak Rocky Woodland (2377)
7b. System not in Provinces 211, 221, or M221; <i>Quercus prinus</i> , <i>Q. stellata</i> , and <i>Q. marilandica</i> dominate the overstory.....	Central Interior Highlands Dry Acidic Glade and Barrens (2363)
8a. System in Provinces 211, 221, or M221; overstory dominated by <i>Quercus muehlenbergii</i> with <i>Acer saccharum</i> , <i>Juniperus virginiana</i> , and <i>Cercis canadensis</i> common associates	Central Appalachian Alkaline Glade and Woodland (2400)
8b. System not in Provinces 211, 221, or M221; overstory dominated by <i>Quercus muehlenbergii</i> , <i>Q. marilandica</i> , or <i>Q. stellata</i> with <i>Acer saccharum</i> , <i>Juniperus virginiana</i> , and <i>Cercis canadensis</i> common associates.....	Central Interior Highlands Calcareous Glade and Barrens (2401)
9a. Systems in the glaciated portion of Provinces 251 or 222 or Sections 223G or 233A.....	10
9b. Systems in unglaciated areas of Provinces 211, 221, or M221 or Sections 223A, 223B, 223D, 223F, or 223S.....	11
10a. Dry-mesic sites on loamy to sandy loam soils, canopy is moderately to fully closed; overstory dominated by <i>Quercus alba</i> , <i>Q. rubra</i> , and/or <i>Q. macrocarpa</i> . <i>Carya</i> spp., especially <i>C. ovata</i> , <i>C. alba</i> , and <i>C. cordiformis</i> , are common associates... North-Central Interior Dry-Mesic Oak Forest and Woodland (2310)	
10b. Dry sites on sandy soils, canopy open to closed, overstory usually dominated by <i>Quercus velutina</i> but sometimes by <i>Q. coccinea</i> and/or <i>Q. stellata</i> , especially in the southern parts of its range..... North-Central Interior Dry Oak Forest and Woodland (2311)	
11a. Systems in unglaciated areas near the Mississippi River in Sections 223A or 223S.....	12
11b. Systems not near the Mississippi River in Sections 223A or 223S	13
12a. Closed-canopy dry-mesic forests on uplands. System is dominated by a combination of <i>Quercus alba</i> , <i>Q. rubra</i> , <i>Carya alba</i> , <i>C. cordiformis</i> , and <i>C. ovata</i> , often with smaller amounts of <i>Acer barbatum</i> , <i>A. saccharum</i> , <i>Fraxinus americana</i> , <i>Juglans nigra</i> , <i>Liquidambar styraciflua</i> , and <i>Ostrya virginiana</i>	Ozark-Ouachita Dry-Mesic Oak Forest (2304)
12b. Open, dry, woodland to (more rarely) closed canopy forest over shallow, well-drained soils. Overstory is dominated by <i>Quercus stellata</i> , <i>Q. marilandica</i> , and <i>Q. coccinea</i> with lesser	

amounts of *Carya texana*, *Quercus alba*, and *Q. falcata*. Understory is characterized by *Schizchyrium scoparium* and *Vaccinium arboreum* **Ozark-Ouachita Dry Oak Woodland (2364)**

- 13a. Dry-mesic sites located in the far south of MZ52 in Subsections 223B, 223D, or 223F14
- 13b. System in Provinces 211, 221, or M22115

14a. Dry-mesic upland sites with the overstory dominated by one or more of the following *Quercus* spp., *Q. alba*, *Q. rubra*, *Q. prinus*, *Q. marilandica*, *Q. stellata*, or *Q. velutina*. *Carya* spp. (*C. alba*, *C. glabra*, *C. texana*) are common. *Pinus echinata* may be present but less than 25% cover **Southern Interior Low Plateau Dry-Mesic Oak Forest (2305)**

14b. Flatwoods sites often with noticeable microtopography (small ridges and low areas); overstory dominated by *Quercus stellata*; low-lying areas often have *Liquidambar styraciflua* or *Quercus phellos* in the overstory and *Juncus* spp. or *Carex* spp. in the understory **South-Central Interior / Upper Coastal Plain Flatwoods (2326)**

15a. Dry sites, usually on acidic substrates with overstory dominated by *Quercus alba*, *Q. falcata*, *Q. rubra*, *Q. prinus*, and *Q. coccinea*. *Acer saccharum*, *Carya cordiformis*, and *Tsuga canadensis* each <15% **Allegheny-Cumberland Dry Oak Forest and Woodland (2317)**

15b. Dry-mesic sites, typically on mid- to low-slopes; dominated by *Quercus alba*, *Q. rubra*, *Q. velutina*, *Q. coccinea* and *Carya* spp. with *Acer rubrum*, *Betula alleghaniensis*, and *Liriodendron tulipifera* as common associates. **Northeastern Interior Dry-Mesic Forest (2303)**

16a. Dry to dry-mesic sites, *Pinus rigida* and/or *Pinus strobus* characteristic, often mixed with *Quercus* spp.; conifer-dominated patches are usually within a matrix of a mixed oak-pine woodland on exposed ridges; range centered on Central Appalachians, Ridge & Valley, and Northern Piedmont in these mapzones **Central Appalachian Pine-Oak Rocky Woodland (2377)**

16b. Mesic sites, *Pinus* spp. not characteristic.....17

17a. Mesic sites in Provinces 251 or 222; *Acer saccharum*, *Fagus grandifolia*, and *Tilia americana* dominate the overstory.....18

17b. Mesic sites in unglaciated landscapes – Provinces 223, 234, 231, 211, 221, M22119

18a. Systems in Province 251 and Sections 222L, 222K and Subsections 222Hf, 222Hb, and 223Ga; overstory dominated by *Acer saccharum* and *Tilia americana*. **North-Central Interior Maple-Basswood Forest (2314)**

18b. Systems in the range of beech (*Fagus grandifolia*) – Sections 222I, 222J, 222K, 222H, 222U, 221F, 251D, 211, 223D, 223F, 223B, 223Ge; overstory dominated by *Acer saccharum* and *Fagus grandifolia*..... **North-Central Interior Beech-Maple Fores (2313)**

19a. Sites in southern Illinois, southern Indiana, or southern Ohio - 223D, 223B, 223F, 223Gb, 223Gc, 223Gd, 234B, 234D, 231H, 211G, 221E; overstory usually a mix of species with no single one strongly dominant, most abundant trees are a combination of *Acer saccharum*, *Fagus grandifolia*, *Fraxinus americana*, *Liriodendron tulipifera*, and *Prunus serotina*. **South-Central Interior Mesophytic Fores (2321)**

- 19b. Sites in eastern Ohio, western Pennsylvania, and western West Virginia – Provinces M221, 211, 221; overstory dominated by *Acer saccharum*, *Betula alleghaniensis*, *Fagus grandifolia*, *Quercus rubra*, *Tilia americana*, and *Tsuga canadensis*.....
**Appalachian (Hemlock-)Northern Hardwood Forest (2370)**
- 20a. Sites on cliffs, talus, or shallow soil over bedrock in the unglaciated areas of extreme northwestern Illinois – Section 222L; physiognomy can vary from closed forest to open savanna; dominant trees also variable – *Pinus strobus*, *Abies balsamea*, *Betula alleghaniensis*, *Quercus muehlenbergii*, or *Juniperus virginiana*..... **Paleozoic Plateau Bluff and Talus (2517)**
- 20b. Sites on deeper soils.....**21**
- 21a. Sites on sandy soils; open and/or patchy tree canopy usually dominated by *Quercus velutina* though some sites may have abundant *Q. macrocarpa* and/or *Q. ellipsoidalis*; herbaceous layer dominated by mid- and tallgrass species such as *Andropogon gerardii*, *Schizachyrium scoparium*, *Sorghastrum nutans*, *Calamovilfa longifolia*, and *Koeleria macrantha*.....
**North Central Oak Barrens (2395)**
- 21b. Sites on loamy or silty soils; open and/or patchy tree canopy dominated by *Quercus macrocarpa*, *Q. alba*, *Q. bicolor*, and/or *Q. palustris*; herbaceous layer dominated by tallgrass species, especially *Andropogon gerardii*, *Sorghastrum nutans*, and *Calamagrostis canadensis* with *Schizachyrium scoparium* often present, too
**North-Central Interior Oak Savanna (2394)**

KEY B – WOODY WETLAND SYSTEMS

- 1a. Systems on floodplains of small, medium, or large rivers.....**2**
- 1b. Systems in depressions, along lakeshores, or in areas with seasonally or permanently high water tables**7**
- 2a. System on moderate to very high gradient small rivers, streams, or ephemeral streams**3**
- 2b. System on medium to larger rivers**4**
- 3a. Sites in southern West Virginia or southern Ohio – Subsections M221Ca, 221Eb, 221En, 221He, 223F. Canopy dominated by *Platanus occidentalis*, *Acer rubrum* var. *trilobum*, *Betula nigra*, *Liquidambar styraciflua*, and *Quercus* spp. Characteristic shrubs include *Hypericum densiflorum*, *Salix* spp., and *Alnus* spp. .**Central Interior and Appalachian Riparian Systems (2472)****
**South-Central Interior Small Stream and Riparian***
- 3b. Sites not in southern West Virginia or southern Ohio – i.e. NOT in Subsections M221Ca, 221Eb, 221En, 221He, 223F. Canopy dominated by *Betula nigra*, *Platanus occidentalis*, and *Acer negundo*. **Central Interior and Appalachian Riparian Systems (2472)****
**Central Appalachian Stream and Riparian***
- 4a. Sites in the prairie region of Illinois and Indiana – Province 251. Tree canopy can vary from strongly dominated by one or two species to a mix of several species. Typical dominants are

- Acer saccharinum*, *Celtis* spp., *Fraxinus pennsylvanica*, *Populus deltoides*, *Salix nigra*, and *Ulmus americana*. Rarely, *Betula nigra*, *Platanus occidentalis*, or *Quercus macrocarpa* can be dominant. **Eastern Great Plains Floodplain Systems (2469)****
..... **North-Central Interior Floodplain***
- 4b. Sites not in the prairie region of Illinois and Indiana, i.e. NOT in Province 2515
- 5a. Sites in southern West Virginia or southern Ohio – Subsections M221Ca, 221Eb, 221En, 221He, 223F. Canopy dominated by *Platanus occidentalis*, *Acer rubrum* var. *trilobum*, *Betula nigra*, *Liquidambar styraciflua*, and *Quercus* spp..... **Central Interior and Appalachian Floodplain Systems (2471)****
..... **Central Appalachian River Floodplain***
- 5b. Sites not in southern West Virginia or southern Ohio – Subsections M221Ca, 221Eb, 221En, 221He, 223F.....6
- 6a. Sites in the forested, glaciated areas of Illinois, Indiana, and Ohio, i.e. Province 222, and in Section 221F. Tree canopy can vary from strongly dominated by one or two species to a mix of several species. Typical dominants are *Acer saccharinum*, *Celtis* spp., *Fraxinus pennsylvanica*, *Populus deltoides*, *Salix nigra*, and *Ulmus americana*. Rarely, *Betula nigra*, *Platanus occidentalis*, or *Quercus macrocarpa* can be dominant. **Central Interior and Appalachian Floodplain Systems (2471)****
..... **North-Central Interior Floodplain***
- 6b. Sites in the forested, non-glaciated areas of Illinois, Indiana, Ohio, West Virginia, and Pennsylvania (except Section 221F), i.e., NOT in Provinces 222 or 251. Typical canopy dominants include *Acer saccharinum*, *Platanus occidentalis*, *Liquidambar styraciflua*, and *Quercus* spp. **Central Interior and Appalachian Floodplain Systems (2471)****
..... **South-Central Interior Floodplain***
- 7a. System dominated by trees (>25% absolute cover of mature trees)8
7b. System dominated by shrubs (>25% absolute cover of shrubs)13
- 8a. Systems characterized by *Acer rubrum*, *Betula alleghaniensis*, *Fraxinus nigra*, *Nyssa sylvatica*, and/or *Tsuga canadensis*.....9
8b. Systems not characterized by *Acer rubrum*, *Betula alleghaniensis*, *Fraxinus nigra*, and/or *Tsuga canadensis*; *Quercus* spp. often abundant.....10
- 9a. Systems in unglaciated parts of Ohio and eastward. *Tsuga canadensis*, *Acer rubrum*, and *Nyssa sylvatica* characteristic, *Fraxinus nigra* absent or unimportant
..... **Central Interior and Appalachian Swamp Systems (2479) ****
..... **North-Central Appalachian Acidic Swamp***
- 9b. Forested swamps dominated by *Acer rubrum*, *Betula alleghaniensis*, and *Fraxinus nigra*. *Larix laricina* sometimes abundant.
..... **Central Interior and Appalachian Swamp Systems (2479) ****
..... **North-Central Interior and Appalachian Rich Swamp***

- 10a. Flatwoods Systems characterized by *Quercus* spp., sites are wet during parts of the year but become dry or nearly so in late summer **11**
- 10b. Systems not characterized by *Quercus* spp., sites only in the unglaciated southern and eastern portions of MZ49, 52, and 62. **12**
- 11a. Flatwoods found in extreme southern Illinois (Sections 231H, 223S, 223D and Province 234), dominant species are *Quercus palustris*, *Q. falcata*, *Q. phellos*, and *Q. stellata*... **South-Central Interior /Upper Coastal Plain Wet Flatwoods (2457)**
- 11b. Flatwoods found throughout the remainder of MZ49, 52, 62, dominated by *Quercus palustris* and/or *Q. bicolor*. *Acer rubrum* sometimes abundant..... **North-Central Interior Wet Flatwoods (2518)**
- 12a. Pondshores and sinkholes (including sagponds) in isolated upland depressions, generally in limestone or dolomite areas and often formed by karst collapse or large or small extent. Typical dominant species are *Acer rubrum*, *Platanus occidentalis*, and *Nyssa* spp. **Central Interior Highlands and Appalachian Sinkhole and Depression Pond*****
- 12b. Sites in extreme southern Illinois, groundwater seepage results in soils that are saturated or sometimes have standing water, characteristic trees are *Nyssa biflora*, *N. sylvatica*, and *Acer rubrum*..... **East Gulf Coastal Plain Northern Seepage Swamp*****
- 13a. System occurs on *Sphagnum* peat AND is dominated by ericaceous shrubs, especially *Chamaedaphne calyculata* and *Myrica gale*..... **Central Interior and Appalachian Swamp Systems (2479)****
..... **North-Central Interior and Appalachian Acidic Peatland***
- 13b. Ericaceous shrubs not common **14**
- 14a. Shrub fen with alkaline groundwater, substrate is marl or shallow peat; often with *Sphagnum* spp. present; abundant shrubs include *Dasiphora fruticosa*, *Cornus* spp., and/or *Salix* spp. **North-Central Interior Shrub-Graminoid Alkaline Fen*****
- 14b. Shrub swamp; substrate is not marl or shallow peat..... **15**
- 15a. System found in northern Illinois, Indiana, or Ohio (Section 222I, 222J, 222K, and 222U); dominant shrubs include *Alnus incana*, *Cornus* spp., *Cephalanthus occidentalis*, *Salix* spp. **Laurentian-Acadian Shrub-Herbaceous Wetland Systems (2494)****
..... **Laurentian-Acadian Wet Meadow-Shrub Swamp***
- 15b. System not found in northern Illinois, Indiana, or Ohio (NOT in Section 222I, 222J, 222K, and 222U); dominant shrubs include *Cornus* spp., *Cephalanthus occidentalis*, *Salix* spp. **Central Interior and Appalachian Herbaceous Wetland Systems (2493)****
..... **North-Central Interior Wet Meadow-Shrub Swamp***

KEY C – UPLAND HERBACEOUS SYSTEMS (<10% woody cover)

- 1a. System on flat Great Lakes lakeplain; dominated by a mix of mesic and wet-mesic prairie species such as *Andropogon gerardii*, *Calamagrostis canadensis*, *Spartina pectinata*, *Panicum*

<i>virgatum</i> , <i>Sorghastrum nutans</i> , and <i>Schizachyrium scoparium</i>	Great Lakes Wet-Mesic Lakeplain Prairie (2411)
1b. System not on flat Great Lakes lakeplain; wet and wet-mesic species rare to absent	2
2a. System on deep soil.....	3
2b. System on shallow soil, bedrock at or near the surface	4
3a. Soil is fine-textured; System dominated by tallgrass species such as <i>Andropogon gerardii</i> , <i>Sorghastrum nutans</i> , <i>Panicum virgatum</i> , often with midgrasses such as <i>Schizachyrium scoparium</i> and forbs such as <i>Liatris</i> spp., <i>Ratibida</i> spp., <i>Echinacea</i> spp., and <i>Solidago</i> spp.	Central Tallgrass Prairie (2421)
3a. Soils sandy or gravelly; System dominated by tall and mid-grasses, especially <i>Andropogon gerardii</i> , <i>Bouteloua curtipendula</i> , <i>Bouteloua gracilis</i> , <i>Schizachyrium scoparium</i> , and <i>Sorghastrum nutans</i>	North-Central Interior Sand and Gravel Tallgrass Prairie (2412)
4a. Bedrock is sandstone, chert, acidic granite, or igneous	Central Interior Highlands Dry Acidic Glade and Barrens (2363)
4b. Bedrock is limestone, dolomite, or other calcareous rock.....	5
5a. System in Provinces 211, 221, or M221	Central Appalachian Alkaline Glade and Woodland (2400)
5b. System not in Provinces 211, 221, or M221	Central Interior Highlands Calcareous Glade and Barrens (2401)

KEY D – HERBACEOUS WETLAND SYSTEMS

1a. Systems on floodplains of rivers	2
1b. Systems in depressions, along lakeshores, or in areas with seasonally or permanently high water tables	7
2a. System on moderate to very high gradient small rivers, streams, or ephemeral streams	3
2b. System on medium to larger rivers	4
3a. Sites in southern West Virginia or southern Ohio – Subsections M221Ca, 221Eb, 221En, 221He, 223F..	Central Interior and Appalachian Riparian Systems (2472)** South-Central Interior Small Stream and Riparian*
3b. Sites not in southern West Virginia or southern Ohio – i.e. NOT in Subsections M221Ca, 221Eb, 221En, 221He, 223F..	Central Interior and Appalachian Riparian Systems (2472)** Central Appalachian Stream and Riparian*
4a. Sites in the prairie region of Illinois and Indiana – Province 251.....	Eastern Great Plains Floodplain Systems (2469)** North-Central Interior Floodplain*
4b. Sites not in the prairie region of Illinois and Indiana, i.e. NOT in Province 251	5

5a. Sites in southern West Virginia or southern Ohio – Subsections M221Ca, 221Eb, 221En, 221He, 223F.	Central Interior and Appalachian Floodplain Systems (2471)**	
.....	Central Appalachian River Floodplain*	
5b. Sites not in southern West Virginia or southern Ohio – Subsections M221Ca, 221Eb, 221En, 221He, 223F.....		6
6a. Sites in the forested, glaciated areas of Illinois, Indiana, and Ohio, i.e. Province 222, and in Section 221F..	Central Interior and Appalachian Floodplain Systems (2471)**	
.....	North-Central Interior Floodplain*	
6b. Sites in the forested, non-glaciated areas of Illinois, Indiana, Ohio, West Virginia, and Pennsylvania (except Section 221F), i.e., NOT in Provinces 222 or 251.....	Central Interior and Appalachian Floodplain Systems (2471)**	
.....	South-Central Interior Floodplain*	
7a. System on estuaries and deltas of rivers draining into Lake Ontario.....	Great Lakes Coastal Marsh Systems (2492)**	
.....	Great Lakes Freshwater Estuary and Delta*	
7b. Not directly affected by Great Lakes water regimes		8
8a. Fens on marl or peat.....		9
8b. Marshes not on marl or peat.....		10
9a. Small wetlands on gentle slopes, fed primarily by groundwater seepage; found in unglaciated parts of Pennsylvania and West Virginia (in these MapZones).....	North-Central Appalachian Seepage Fen***	
9b. Small wetlands found in glaciated portions of Pennsylvania, Ohio, Indiana, and Illinois	North-Central Interior Shrub-Graminoid Alkaline Fen***	
10a. System in Province 251; shallow marshes and wet meadows which can be dominated by a variety of species including <i>Carex aquatilis</i> , <i>Carex atherodes</i> , <i>Carex lacustris</i> , <i>Carex pellita</i> , <i>Carex stricta</i> , <i>Calamagrostis canadensis</i> , <i>Phalaris arundinacea</i> , <i>Schoenoplectus</i> spp., <i>Spartina pectinata</i> , <i>Typha</i> spp.	Eastern Great Plains Wet Meadow, Prairie, and Marsh (2488)	
10b. System not in Province 251		11
11a. System dominated by <i>Schoenoplectus</i> spp., <i>Typha</i> spp. and floating-leaved or submergent species such as <i>Potamogeton</i> spp., <i>Nuphar</i> spp., and <i>Nymphaea</i> spp.		12
11b. System not dominated by <i>Schoenoplectus</i> spp., <i>Typha</i> spp. and floating-leaved or submergent species such as <i>Potamogeton</i> spp., <i>Nuphar</i> spp., and <i>Nymphaea</i> spp.		13
12a. System found in northern Illinois, Indiana, or Ohio (Section 222I, 222J, 222K, and 222U)	Laurentian-Acadian Shrub-Herbaceous Wetland Systems (2494)**	
.....	Laurentian-Acadian Freshwater Marsh*	

- 12b. System not found in northern Illinois, Indiana, or Ohio (NOT in Section 222I, 222J, 222K, and 222U) **Central Interior and Appalachian Herbaceous Wetland Systems (2493)****
**North-Central Interior Freshwater Marsh***
- 13a. Wet-meadow System found in 222H or 221F, dominated by species such as *Calamagrostis* spp., *Carex* spp., and *Spartina pectinata*
 **Central Interior and Appalachian Herbaceous Wetland Systems (2493)****
**North-Central Interior Wet Meadow-Shrub Swamp***
- 13b. System found in unglaciated areas of MZ49, 52, 62; pondshores and sinkholes (including sagponds) in isolated upland depressions, generally in limestone or dolomite areas and often formed by karst collapse or large or small extent
 **Central Interior Highlands and Appalachian Sinkhole and Depression Pond*****

KEY E – SPARSELY VEGETATED SYSTEMS (<10% vascular cover)

- 1a. System on dunes near Great Lakes; substrate is sand
**Laurentian-Acadian Sparsely Vegetated Systems (2499)****
 **Great Lakes Dune***
- 1b. Substrate is bedrock or talus2
- 2a. Cliffs or talus of acidic rock (sandstone, granite)3
- 2b. Cliffs or talus of alkaline (limestone, dolostone) or, more rarely, circumneutral rock.....5
- 3a. Cliffs or talus in Illinois or Indiana **Central Interior Acidic Cliff and Talus*****
- 3b. Cliffs or talus in Ohio, Pennsylvania, or West Virginia4
- 4a. Cliff or talus NOT in M221C..... **North-Central Appalachian Acidic Cliff and Talus*****
- 4b. Cliff or talus in Section M221C..... **Cumberland Acidic Cliff and Rockhouse*****
- 5a. Cliff or talus in NOT in the Appalachians, i.e. NOT in Province M221
 **Central Interior Calcareous Cliff and Talus*****
- 5b. Cliff or talus in the Appalachians – Province M221.....
**North-Central Appalachian Circumneutral Cliff and Talus*****