

COMMON NAME (PARK-SPECIFIC): ACIDIC OAK - HICKORY FOREST

SYNONYMS

NVC English Name: White Oak - Northern Red Oak - Mockernut Hickory / Flowering Dogwood / Deerberry / Naked-stem Tick-trefoil Piedmont Forest

NVC Scientific Name: *Quercus alba* - *Quercus rubra* - *Carya alba* / *Cornus florida* / *Vaccinium stamineum* / *Desmodium nudiflorum* Piedmont Forest

NVC Identifier: C EGL008475

LOCAL INFORMATION

Environmental Description: Acidic Oak - Hickory Forest is a mature deciduous forest found on lower slopes and on rolling upland areas of Petersburg National Battlefield.

Vegetation Description: Overstory composition varies somewhat from stand to stand but is dominated by mixtures of oaks and hickories, typically *Quercus alba* (white oak), *Quercus rubra* (northern red oak), *Quercus falcata* (southern red oak), *Quercus velutina* (black oak), *Carya alba* (mockernut hickory), and *Carya glabra* (pignut hickory). Other trees that can occur in the canopy and subcanopy, usually with less cover, include *Acer rubrum* (red maple), *Carya ovalis* (red hickory), *Fagus grandifolia* (American beech), *Fraxinus americana* (white ash), *Liquidambar styraciflua* (sweetgum), *Liriodendron tulipifera* (tuliptree), *Nyssa sylvatica* (blackgum), *Pinus taeda* (loblolly pine), *Quercus coccinea* (scarlet oak), and *Quercus stellata* (post oak). The shrub layer is usually open and composed of species from the canopy layers as well as *Cornus florida* (flowering dogwood), *Ilex opaca* var. *opaca* (American holly), and *Carpinus caroliniana* (American hornbeam). The low-shrub / herb layer is often very sparse in cover, but diverse in species, characteristically with mixtures of woody seedlings, sedges, grasses, and forbs. Typical grasses and sedges in this forest are *Carex albicans* var. *australis* (stellate sedge), *Carex complanata* (hirsute sedge), *Carex debilis* (white edge sedge), *Carex laxiflora* var. *laxiflora* (broad looseflower sedge), *Carex swanii* (Swan's sedge), *Chasmanthium laxum* (slender woodoats), *Chimaphila maculata* (striped prince's pine), *Danthonia spicata* (poverty oatgrass), *Dichanthelium boscii* (Bosc's panicgrass), *Dichanthelium commutatum* (variable panicgrass), *Dichanthelium dichotomum* (cypress panicgrass), *Piptochaetium avenaceum* (blackseed speargrass), *Schizachyrium scoparium* (little bluestem), and *Scleria oligantha* (littlehead nutrush). Common forbs in this forest are *Aristolochia serpentaria* (Virginia snakeroot), *Desmodium nudiflorum* (nakedflower ticktrefoil), *Dioscorea quaternata* (fourleaf yam), *Galium circaeans* (licorice bedstraw), *Polygonatum biflorum* var. *biflorum* (smooth Solomon's-seal), and *Polystichum acrostichoides* (Christmas fern). Common woody vines and shrubs include *Euonymus americanus* (strawberry bush), *Hypericum hypericoides* ssp. *hypericoides* (St. Andrew's cross), *Vaccinium pallidum* (Blue Ridge blueberry), and *Vitis rotundifolia* (muscadine). Disturbed stands may have a high cover of the exotic vine *Lonicera japonica* (Japanese honeysuckle) or the exotic grass *Microstegium vimineum* (Nepalese browntop).

Quercus alba (white oak) and/or *Quercus rubra* (northern red oak) are usually the leading oak dominants in these forests, rarely *Quercus falcata* (southern red oak) or *Quercus velutina* (black oak). Examples impacted by deer browsing may have little herb cover and be difficult to

distinguish from Coastal Plain Mixed Oak / Heath Forest, particularly those with low to moderate heath cover. Stands with wind damage from recent hurricanes may have canopy openings with weedy or ruderal species. Most examples of Acidic Oak - Hickory Forest in Petersburg National Battlefield are mature with large trees; however, younger stands with small trees are possible. Most stands of this forest in Petersburg National Battlefield are small, remnant patches (0.5–2 ha) within a larger, disturbed landscape. However, a few larger stands exist in the park (2–8 ha).

Most Abundant Species:

Stratum	Lifeform	Species
Tree canopy	Broad-leaved deciduous tree	<i>Carya alba</i> (mockernut hickory), <i>Carya glabra</i> (pignut hickory), <i>Quercus alba</i> (white oak), <i>Quercus rubra</i> (northern red oak)

Characteristic Species: *Carex albicans* var. *australis* (stellate sedge), *Carex complanata* (hirsute sedge), *Carya alba* (mockernut hickory), *Carya glabra* (pignut hickory), *Dichanthelium boscii* (Bosc's panicgrass), *Polygonatum biflorum* var. *biflorum* (smooth Solomon's-seal), *Quercus alba* (white oak), *Quercus rubra* (northern red oak)

Other Noteworthy Species:

<u>Species</u>	<u>G</u> Rank	<u>T</u> ype	<u>N</u> ote
<i>Lonicera japonica</i> (Japanese honeysuckle)	-	plant	invasive nonnative
<i>Microstegium vimineum</i> (Nepalese browntop)	-	plant	invasive nonnative

Subnational Distribution with Crosswalk Data:

<u>State</u>	<u>S</u> Rank	<u>R</u> el	<u>C</u> onf	<u>S</u> Name	<u>R</u> eference
VA	SNR*	B	I	Acidic Oak - Hickory Forest	Fleming et al. 2001

Local Range: Acidic Oak - Hickory Forest is mapped on 34 hectares (84 acres) mostly in the Main Unit (Eastern Front), with two small stands at Fort Gregg and Five Forks Battlefield.

Classification Comments: Although Acidic Oak - Hickory Forest may have low to moderate cover of heath species in the shrub layer, it is distinguished from Coastal Plain Mixed Oak / Heath Forest by having greater species diversity in all layers. Typically, this forest has twice the species richness of Coastal Plain Mixed Oak / Heath Forest. It is distinguished by a greater herb diversity and by the relative importance of *Carya* (hickory) species in the canopy and subcanopy layers.

Other Comments: Information not available.

Local Description Authors: K. D. Patterson.

Plots: PETE.3, PETE.6.

Petersburg National Battlefield Inventory Notes: Information not available.

GLOBAL INFORMATION

NVC CLASSIFICATION

Physiognomic Class	Forest (I)
Physiognomic Subclass	Deciduous forest (I.B.)
Physiognomic Group	Cold-deciduous forest (I.B.2.)
Physiognomic Subgroup	Natural/Semi-natural cold-deciduous forest (I.B.2.N.)
Formation	Lowland or submontane cold-deciduous forest (I.B.2.N.a.)
Alliance	<i>Quercus alba</i> - (<i>Quercus rubra</i> , <i>Carya</i> spp.) Forest Alliance (A.239)
Alliance (English name)	White Oak - (Northern Red Oak, Hickory species) Forest Alliance
Association	<i>Quercus alba</i> - <i>Quercus rubra</i> - <i>Carya alba</i> / <i>Cornus florida</i> / <i>Vaccinium stamineum</i> / <i>Desmodium nudiflorum</i> Piedmont Forest

Association (English name) White Oak - Northern Red Oak - Mockernut Hickory / Flowering Dogwood / Deerberry / Naked-stem Tick-trefoil Piedmont Forest

Ecological System(s): Northern Atlantic Coastal Plain Hardwood Forest (CES203.475).
 Northeastern Interior Dry-Mesic Oak Forest (CES202.592).
 Southern Piedmont Dry Oak-(Pine) Forest (CES202.339).
 Piedmont Hardpan Woodland and Forest (CES202.268).

GLOBAL DESCRIPTION

Concept Summary: This forest is found on submesic to subxeric upland sites throughout the Piedmont of the Carolinas, Virginia, south-central Maryland, and possibly Georgia. It favors mid- to upper-slope positions with northerly or easterly aspects, or mid- to lower slopes with more southerly aspects. In drier landscapes, this type occupies habitats considered relatively mesic (e.g., concave slopes, lower slopes, shallow ravines). These sites are described as dry to intermediate in soil moisture. The soils are moderately to strongly acidic and nutrient-poor, being weathered primarily from felsic metamorphic, metasedimentary, and sedimentary rocks, or composed of unconsolidated sediments. At some sites, soils are weathered from interbedded metasedimentary and mafic rocks, resulting in soil chemistry that is intermediate or slightly basic. Stands of this forest are closed to somewhat open and are dominated by mixtures of oaks and hickories, with *Quercus alba* (white oak) being most prevalent, along with *Quercus rubra* (northern red oak), *Quercus coccinea* (scarlet oak), *Quercus velutina* (black oak), *Quercus falcata* (southern red oak), *Carya alba* (mockernut hickory), *Carya ovalis* (red hickory), and *Carya glabra* (pignut hickory). *Carya* spp. (hickories) are common in this type but often most abundant in the understory. In forests with a history of disturbance, such as selective logging or windstorms, early-successional species such as *Liriodendron tulipifera* (tuliptree) or *Pinus* sp. (a pine) may codominate. In Virginia examples, *Quercus prinus* (chestnut oak) is inconstant but sometimes important. In addition, *Pinus* spp. (pines), *Liriodendron tulipifera* (tuliptree), *Liquidambar styraciflua* (sweetgum), and *Acer rubrum* (red maple) may be common. Understory species include *Acer rubrum* (red maple), *Cornus florida* (flowering dogwood), *Oxydendrum arboreum* (sourwood), *Ilex opaca* var. *opaca* (American holly), and *Nyssa sylvatica* (blackgum). Shrubs include *Vaccinium stamineum* (deerberry), *Vaccinium pallidum* (Blue Ridge blueberry), *Viburnum acerifolium* (mapleleaf viburnum), *Viburnum rafinesquianum* (downy arrowwood), and *Euonymus americanus* (strawberry bush). The woody vines *Vitis rotundifolia* (muscadine) and *Toxicodendron radicans* (eastern poison ivy) often are present. Herbs vary from sparse to moderately dense, with dry-mesophytic, acid-tolerant species such as *Hexastylis* spp. (heartleafs), *Goodyera pubescens* (downy rattlesnake plantain), *Chimaphila maculata* (striped prince's pine), *Desmodium nudiflorum* (nakedflower ticktrefoil), *Maianthemum racemosum* (feathery false lily of the valley), *Polygonatum biflorum* (smooth Solomon's seal), *Viola hastata* (halberdleaf yellow violet), *Tipularia discolor* (crippled crane-fly), and *Hieracium venosum* (rattlesnakeweed) prevalent. This association occupies less nutrient-rich habitats than *Quercus rubra* - *Quercus alba* - *Carya glabra* / *Geranium maculatum* Forest (CEGL007237).

Environmental Description: The sites on which this vegetation is found are described as "intermediate" in soil moisture (Jones 1988a, 1988b). Soils are less nutrient-rich than *Quercus alba* - *Quercus rubra* - *Carya (ovata, carolinae-septentrionalis)* / *Cercis canadensis* Forest (CEGL007232). Virginia stands occur on submesic to subxeric uplands with acidic, moderately nutrient-poor soils weathered from felsic metamorphic, metasedimentary, and sedimentary rocks (especially Triassic siltstones), and unconsolidated sediments. However, Virginia soils supporting this type are demonstrably more fertile than those supporting very species-poor mixed oak forests with dense ericaceous shrub layers. At some sites, soils are weathered from

interbedded metasedimentary and mafic rocks, resulting in soil chemistry that is intermediate or slightly basic. This type frequently occupies somewhat mesic habitats (e.g., concave slopes, lower slopes, shallow ravines) in dry landscapes where mixed oak/heath types are prevalent. It is a large-patch or matrix type in some parts of Virginia but is not as abundant in the Piedmont as mixed oak/heath forests (G. Fleming pers. comm. 2001). In North Carolina, this is a matrix type, probably the most common forest type remaining in the Piedmont.

Vegetation Description: Stands of this forest are closed to somewhat open, and are dominated by mixtures of oaks and hickories, with *Quercus alba* (white oak) being most prevalent, along with *Quercus rubra* (northern red oak), *Quercus coccinea* (scarlet oak), *Quercus velutina* (black oak), *Carya alba* (mockernut hickory), *Carya ovalis* (red hickory), and *Carya glabra* (pignut hickory). *Carya* spp. (hickories) are common in this type but often most abundant in the understory. In Virginia examples, *Quercus prinus* (chestnut oak) and *Quercus falcata* (southern red oak) are inconstant but sometimes important. In addition, *Pinus* spp. (pines), *Liriodendron tulipifera* (tuliptree), *Liquidambar styraciflua* (sweetgum), and *Acer rubrum* (red maple) may be common, especially in disturbed stands. Understory species include *Acer rubrum* (red maple), *Cornus florida* (flowering dogwood), *Oxydendrum arboreum* (sourwood), *Ilex opaca* var. *opaca* (American holly), and *Nyssa sylvatica* (blackgum). Shrubs include *Vaccinium stamineum* (deerberry), *Vaccinium pallidum* (Blue Ridge blueberry), *Viburnum acerifolium* (mapleleaf viburnum), *Viburnum rafinesquianum* (downy arrowwood), and *Euonymus americanus* (strawberry bush). In Virginia, *Vaccinium pallidum* (Blue Ridge blueberry) and *Vaccinium stamineum* (deerberry) are the principal ericads of patchy low-shrub layers (G. Fleming pers. comm. 2004). The woody vines *Vitis rotundifolia* (muscadine) and *Toxicodendron radicans* (eastern poison ivy) often are present. Herbs vary from sparse to moderately dense, with dry-mesophytic species such as *Hexastylis* spp. (heartleafs), *Goodyera pubescens* (downy rattlesnake plantain), *Chimaphila maculata* (striped prince's pine), *Desmodium nudiflorum* (nakedflower ticktrefoil), *Maianthemum racemosum* (feathery false lily of the valley), *Polygonatum biflorum* (smooth Solomon's seal), *Viola hastata* (halberdleaf yellow violet), *Tipularia discolor* (crippled crane-fly), *Carex albicans* (whitening sedge), and *Hieracium venosum* (rattlesnakeweed) prevalent (Schafale and Weakley 1990). Although not lush, these forests can be impressively species-rich, with high woody diversity and many low-cover herbaceous species occurring. Species richness of 116 Virginia plots averages 53 taxa per 400 square meters, varying from a low of 17 to a high of 114. Low species richness in this type is most often the result of long-term overgrazing by large deer populations. At least some of the stands with high species richness are located on sites where deer populations are effectively controlled.

Most Abundant Species:

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Carya alba</i> (mockernut hickory), <i>Carya glabra</i> (pignut hickory), <i>Carya ovalis</i> (red hickory), <i>Quercus alba</i> (white oak), <i>Quercus coccinea</i> (scarlet oak), <i>Quercus rubra</i> (northern red oak), <i>Quercus velutina</i> (black oak)
Tree subcanopy	Broad-leaved deciduous tree	<i>Cornus florida</i> (flowering dogwood), <i>Nyssa sylvatica</i> (blackgum), <i>Oxydendrum arboreum</i> (sourwood)
Tree subcanopy	Broad-leaved evergreen tree	<i>Ilex opaca</i> var. <i>opaca</i> (American holly)

Characteristic Species: *Acer rubrum* (red maple), *Carya alba* (mockernut hickory), *Carya glabra* (pignut hickory), *Carya ovalis* (red hickory), *Chimaphila maculata* (striped prince's pine), *Cornus florida* (flowering dogwood), *Desmodium nudiflorum* (nakedflower ticktrefoil), *Euonymus americanus* (strawberry bush), *Goodyera pubescens* (downy rattlesnake plantain), *Hieracium venosum* (rattlesnakeweed), *Ilex opaca* var. *opaca* (American holly), *Liquidambar styraciflua* (sweetgum), *Liriodendron tulipifera* (tuliptree), *Maianthemum racemosum* (feathery false lily of the valley), *Nyssa sylvatica* (blackgum), *Oxydendrum arboreum* (sourwood), *Polygonatum biflorum* (smooth Solomon's seal), *Quercus alba* (white oak), *Quercus coccinea* (scarlet oak), *Quercus rubra* (northern red oak), *Quercus velutina* (black oak), *Tipularia discolor* (crippled crane fly), *Toxicodendron radicans* (eastern poison ivy), *Vaccinium pallidum* (Blue Ridge blueberry), *Vaccinium stamineum* (deerberry), *Viburnum acerifolium* (mapleleaf viburnum), *Viburnum rafinesquianum* (downy arrowwood), *Viola hastata* (halberdleaf yellow violet), *Vitis rotundifolia* (muscadine).

Other Noteworthy Species: Information not available.

USFWS Wetland System: Not applicable.

DISTRIBUTION

Range: This association occurs throughout the Piedmont of the Carolinas, Virginia, south-central Maryland, and possibly Georgia. In northern Virginia and Maryland, it also occurs occasionally in the Coastal Plain.

States/Provinces: GA?, MD, NC, SC, VA.

Federal Lands: DOD (Fort Pickett, Kerr Reservoir); NPS (Appomattox Court House, Booker T. Washington, C&O Canal, Colonial, Fredericksburg-Spotsylvania, George Washington Parkway, Guilford Courthouse, Kings Mountain, Manassas, Ninety Six, Petersburg, Prince William, Richmond, Rock Creek); USFS (Oconee?, Uwharrie).

CONSERVATION STATUS

Rank: G4G5 (15-Feb-2007).

Reasons: This is not a rare community type, although stands older than about 80 years old are probably rare. Most of the rolling upland landscape of the Piedmont and other regions where this occurs have been logged more than once since European settlement. This is a large-patch or matrix type in some regions of Virginia (G. Fleming pers. comm. 2001). In North Carolina, this is a matrix type, probably the most common forest type remaining in the Piedmont.

CLASSIFICATION INFORMATION

Status: Standard.

Confidence: 1 - Strong.

Comments: At the northern end of the range, the classification is supported by analysis of a 1,250-plot regional dataset assembled for the NCR and mid-Atlantic national parks vegetation mapping project. In that analysis, this association was represented by 116 Virginia plots and several from Montgomery County, Maryland.

Similar Associations:

- *Quercus (alba, rubra, velutina) / Cornus florida / Viburnum acerifolium* Forest (CEGL006336)--northern analogue from Maryland to New England.
- *Quercus alba - Carya alba / Euonymus americanus / Hexastylis arifolia* Forest (CEGL006227)--similar with a more southerly range.
- *Quercus alba - Carya alba / Vaccinium elliottii* Forest [Provisional] (CEGL007224)--of the Coastal Plain.
- *Quercus alba - Carya glabra / Mixed Herbs Coastal Plain* Forest (CEGL007226)--of the Coastal Plain.

- *Quercus alba* - *Quercus nigra* - *Quercus falcata* / *Ilex opaca* / *Clethra alnifolia* - *Arundinaria gigantea* ssp. *tecta* Forest (CEGL007862)--of the Coastal Plain.
- *Quercus alba* - *Quercus rubra* - *Carya (ovata, carolinae-septentrionalis)* / *Cercis canadensis* Forest (CEGL007232)--occurs in the same region but on basic soils weathered from mafic rocks.
- *Quercus falcata* - *Quercus alba* - *Carya alba* / *Oxydendrum arboreum* / *Vaccinium stamineum* Forest (CEGL007244)--is a drier community of similar substrates, with more *Quercus falcata* or *Quercus stellata* than *Quercus rubra* codominating with *Quercus alba*.
- *Quercus rubra* - *Quercus alba* - *Carya glabra* / *Geranium maculatum* Forest (CEGL007237).
- *Quercus rubra* / *Magnolia tripetala* - *Cercis canadensis* / *Actaea racemosa* - *Tiarella cordifolia* Forest (CEGL003949).

Related Concepts:

- *Quercus alba* - *Quercus rubra* - *Carya (alba, glabra)* / *Cornus florida* / *Vaccinium stamineum* Forest (VDNH 2003) =
- *Quercus alba* - *Quercus rubra* - *Carya (alba, glabra)* / *Cornus florida* / *Vaccinium stamineum* Forest (Fleming pers. comm.) ?
- IA6i. Interior Upland Dry-Mesic Oak - Hickory Forest (Allard 1990) B
- Oak - Chestnut - Hickory Forest (Ambrose 1990) B
- Piedmont Acidic Oak-Hickory Forest (Fleming et al. 2004) ?
- White oak - northern red oak - false Solomon's seal (*Quercus alba* - *Quercus rubra* - *Smilacina racemosa*) community type (Jones 1988a) ?
- White oak - northern red oak - false Solomon's seal (*Quercus alba* - *Quercus rubra* - *Smilacina racemosa*) community type (Jones 1988b) ?

SOURCES

Description Authors: M. P. Schafale and G. P. Fleming.

References: Allard 1990, Ambrose 1990, Fleming et al. 2001, Fleming et al. 2004, Fleming pers. comm., Harrison 2004, Jones 1988a, Jones 1988b, NRCS 2006, Nelson 1986, Patterson pers. comm., Schafale and Weakley 1990, Skeen et al. 1980, Southeastern Ecology Working Group n.d., VDNH 2003.



Figure I7. Acidic Oak - Hickory Forest (plot PETE.3) at Petersburg National Battlefield. August 2004. NAD 1983 / UTM easting 289607, northing 4122632.

COMMON NAME (PARK-SPECIFIC): COASTAL PLAIN MIXED OAK / HEATH FOREST

SYNONYMS

NVC English Name: White Oak - Southern Red Oak - (Sand Hickory) / Dangleberry Forest
NVC Scientific Name: *Quercus alba* - *Quercus falcata* - (*Carya pallida*) / *Gaylussacia frondosa* Forest
NVC Identifier: C EGL006269

LOCAL INFORMATION

Environmental Description: Coastal Plain Mixed Oak / Heath Forest occurs on xeric upland flats and gentle slopes over sandy, well-drained soils.

Vegetation Description: The canopy is typically dominated by *Quercus alba* (white oak) occurring with varying mixtures of *Quercus coccinea* (scarlet oak), *Quercus velutina* (black oak), *Quercus falcata* (southern red oak), and *Pinus taeda* (loblolly pine). Other canopy and subcanopy associates can include *Quercus prinus* (chestnut oak), *Acer rubrum* (red maple), *Nyssa sylvatica* (blackgum), *Oxydendrum arboreum* (sourwood), and *Sassafras albidum* (sassafras). Typical tall shrubs in this forest can include *Ilex opaca* var. *opaca* (American holly), *Carya pallida* (sand hickory), *Castanea pumila* (chinkapin), *Diospyros virginiana* (common persimmon), *Sassafras albidum* (sassafras), *Vaccinium stamineum* (deerberry), and *Cornus florida* (flowering dogwood). Herbs such as *Chasmanthium laxum* (slender woodoats), and *Chimaphila maculata* (striped prince's pine) are absent to very sparse, with short ericaceous shrubs or leaf litter dominating the ground layer; most commonly *Gaylussacia frondosa* (blue huckleberry), but other common shrub species include *Gaylussacia baccata* (black huckleberry), *Vaccinium pallidum* (Blue Ridge blueberry), and *Vitis rotundifolia* (muscadine).

Disturbed or fire-suppressed examples may have high cover of *Liquidambar styraciflua* (sweetgum) or *Liriodendron tulipifera* (tuliptree). Young stands of this forest are dense and shrubby with small-diameter trees. Some stands have a high proportion of *Pinus taeda* (loblolly pine) in the canopy and may appear on photography with a mixed evergreen-deciduous signature.

Most Abundant Species:

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus alba</i> (white oak)
Short shrub/sapling	Broad-leaved deciduous shrub	<i>Gaylussacia frondosa</i> (blue huckleberry)

Characteristic Species: *Carya pallida* (sand hickory), *Gaylussacia frondosa* (blue huckleberry), *Oxydendrum arboreum* (sourwood), *Pinus taeda* (loblolly pine), *Quercus alba* (white oak), *Quercus coccinea* (scarlet oak).

Other Noteworthy Species: Information not available.

Subnational Distribution with Crosswalk Data:

<u>State</u>	<u>SRank</u>	<u>Rel</u>	<u>Conf</u>	<u>SName</u>	<u>Reference</u>
VA	SNR*	B	1	Oak / Heath Forest	Fleming et al. 2006

Local Range: Coastal Plain Mixed Oak / Heath Forest is primarily at Five Forks Battlefield, with a few stands in the Main Unit (Eastern Front). It is mapped as 118 hectares (292 acres) in Petersburg National Battlefield.

Classification Comments: This type is distinguished from Acidic Oak - Hickory Forest by the presence of a dense, often continuous, ericaceous shrub layer, the absence or lower frequency of *Carya* (hickory) species, and the absence or very low cover of herbaceous species. Coastal Plain Mixed Oak / Heath Forest, on average, has about half the number of species as found in typical examples of Acidic Oak - Hickory Forest.

Other Comments: Polygons mapped as this type may contain small (less than 0.5 ha) inclusions of Coastal Plain / Piedmont Acidic Seepage Swamp where the polygons cross ravine bottoms.

Local Description Authors: K. D. Patterson.

Plots: PETE.1, PETE.5.

Petersburg National Battlefield Inventory Notes: Information not available.

GLOBAL INFORMATION

NVC CLASSIFICATION

Physiognomic Class	Forest (I)
Physiognomic Subclass	Deciduous forest (I.B.)
Physiognomic Group	Cold-deciduous forest (I.B.2.)
Physiognomic Subgroup	Natural/Semi-natural cold-deciduous forest (I.B.2.N.)
Formation	Lowland or submontane cold-deciduous forest (I.B.2.N.a.)
Alliance	<i>Quercus alba</i> - <i>Quercus (falcata, stellata)</i> Forest Alliance (A.241)
Alliance (English name)	White Oak - (Southern Red Oak, Post Oak) Forest Alliance
Association	<i>Quercus alba</i> - <i>Quercus falcata</i> - (<i>Carya pallida</i>) / <i>Gaylussacia frondosa</i> Forest
Association (English name)	White Oak - Southern Red Oak - (Sand Hickory) / Dangleberry Forest
Ecological System(s):	Northern Atlantic Coastal Plain Hardwood Forest (CES203.475).

GLOBAL DESCRIPTION

Concept Summary: This oak forest of the unglaciated northeastern Coastal Plain generally occurs on well-drained acidic soils, primarily loamy sands, sandy loams and silty/clay loams. Occasional stands occur on imperfectly drained, alternately wet and dry upland flats with hardpan subsoils. The canopy is dominated by a mixture of oaks, especially *Quercus alba* (white oak), *Quercus falcata* (southern red oak), and *Quercus velutina* (black oak). Associates include *Sassafras albidum* (sassafras), *Quercus coccinea* (scarlet oak), *Quercus stellata* (post oak), *Liquidambar styraciflua* (sweetgum), *Nyssa sylvatica* (blackgum), and *Pinus taeda* (loblolly pine), with *Acer rubrum* (red maple), *Ilex opaca* var. *opaca* (American holly), and *Cornus florida* (flowering dogwood) often forming a subcanopy. *Liriodendron tulipifera* (tuliptree) may be a canopy component in mature, fire-suppressed stands. *Carya pallida* (sand hickory) may also be present in the canopy. The shrub layer is well-developed and dominated by the deciduous ericads *Gaylussacia frondosa* (blue huckleberry), *Gaylussacia baccata* (black huckleberry), *Vaccinium pallidum* (Blue Ridge blueberry), *Vaccinium stamineum* (deerberry), and occasionally *Lyonia mariana* (piedmont staggerbush). The vines *Smilax rotundifolia* (roundleaf greenbrier) and *Vitis rotundifolia* (muscadine) may be important in some stands. The herbaceous layer is generally sparse and characterized by dry-site species such as *Pteridium aquilinum* (western brackenfern), *Cypripedium acaule* (moccasin flower), *Chimaphila maculata* (striped prince's pine), and *Gaultheria procumbens* (eastern teaberry).

Environmental Description: This community generally occurs on well-drained acidic soils, primarily loamy sands, sandy loams and silty/clay loams. Occasional stands occur on imperfectly drained, alternately wet and dry, upland flats with hardpan subsoils. Even on the latter, moisture potential of most sites supporting this vegetation can be characterized as subxeric to xeric. Soil

samples collected from plots of this vegetation type in Virginia are extremely acidic, with very low base cation levels and total base saturation.

Vegetation Description: Physiognomy is generally a closed to somewhat open forest. The overstory of mid- to late-successional stands is dominated by a mixture of oaks, especially *Quercus alba* (white oak), *Quercus falcata* (southern red oak), and *Quercus velutina* (black oak). Early-successional stands recovering from recent logging or agricultural conversion usually have a strong admixture of *Pinus taeda* (loblolly pine). Other canopy associates include *Sassafras albidum* (sassafras), *Quercus coccinea* (scarlet oak) (occasionally codominant), *Quercus stellata* (post oak), *Liquidambar styraciflua* (sweetgum), *Nyssa sylvatica* (blackgum), *Carya alba* (mockernut hickory), and *Carya pallida* (sand hickory) (occasionally codominant). *Acer rubrum* (red maple), *Ilex opaca* var. *opaca* (American holly), and *Cornus florida* (flowering dogwood) are the principal subcanopy trees. In the southern part of the range, *Oxydendrum arboreum* (sourwood) and scrambling vines of *Vitis rotundifolia* (muscadine) can be important in the understory. The shrub layer is well-developed and dominated by the deciduous ericads *Gaylussacia frondosa* (blue huckleberry), *Gaylussacia baccata* (black huckleberry), *Vaccinium pallidum* (Blue Ridge blueberry), *Vaccinium stamineum* (deerberry), and occasionally *Lyonia mariana* (piedmont staggerbush). The herbaceous layer is generally sparse and characterized by dry-site species such as *Pteridium aquilinum* (western brackenfern), *Cypripedium acaule* (moccasin flower), *Chimaphila maculata* (striped prince's pine), and *Gaultheria procumbens* (eastern teaberry).

Most Abundant Species:

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus alba</i> (white oak), <i>Quercus coccinea</i> (scarlet oak), <i>Quercus falcata</i> (southern red oak)
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Gaylussacia baccata</i> (black huckleberry), <i>Vaccinium pallidum</i> (Blue Ridge blueberry), <i>Vaccinium stamineum</i> (deerberry)
Shrub/sapling (tall & short)	Vine/Liana	<i>Smilax rotundifolia</i> (roundleaf greenbrier), <i>Vitis rotundifolia</i> (muscadine)

Characteristic Species: *Acer rubrum* (red maple), *Carya pallida* (sand hickory), *Chimaphila maculata* (striped prince's pine), *Cornus florida* (flowering dogwood), *Cypripedium acaule* (moccasin flower), *Gaultheria procumbens* (eastern teaberry), *Gaylussacia baccata* (black huckleberry), *Gaylussacia frondosa* (blue huckleberry), *Ilex opaca* var. *opaca* (American holly), *Nyssa sylvatica* (blackgum), *Pinus taeda* (loblolly pine), *Pteridium aquilinum* (western brackenfern), *Quercus alba* (white oak), *Quercus coccinea* (scarlet oak), *Quercus falcata* (southern red oak), *Quercus stellata* (post oak), *Quercus velutina* (black oak), *Vaccinium pallidum* (Blue Ridge blueberry), *Vaccinium stamineum* (deerberry).

Other Noteworthy Species: Information not available.

USFWS Wetland System: Not applicable.

DISTRIBUTION

Range: This association occurs on the Coastal Plain from New Jersey to Virginia and possibly northeastern North Carolina. In central and southeastern Virginia, it extends slightly into the eastern portion of the Piedmont.

States/Provinces: DE, MD, NC?, NJ:S3S4, VA:S4S5.

Federal Lands: DOD (Fort A.P. Hill, Yorktown); NPS (Fredericksburg-Spotsylvania, National Capital-East?, Petersburg, Richmond); USFWS (Blackwater, Chesapeake Marshlands, Prime Hook).

CONSERVATION STATUS

Rank: G4G5 (1-Dec-1997).

Reasons: The type is common and widespread on the Coastal Plain from New Jersey to Virginia. Mature examples are uncommon, and all stands are vulnerable to logging disturbances and fire suppression.

CLASSIFICATION INFORMATION

Status: Standard.

Confidence: 2 - Moderate.

Comments: Classification is supported by analysis of a 1,250-plot regional dataset assembled for the NCR and mid-Atlantic national parks vegetation mapping projects. In that classification, this association was represented by 18 plots. (*Pinus taeda*) - *Quercus falcata* / *Gaylussacia frondosa* Forest (CEGL006169) has been archived and incorporated into this type by Gary Fleming.

Similar Associations:

- *Pinus rigida* - *Quercus coccinea* - *Quercus falcata* / (*Quercus marilandica*) / *Gaylussacia frondosa* Woodland (CEGL006329).
- *Quercus alba* - *Quercus (coccinea, velutina, prinus)* / *Gaylussacia baccata* Forest (CEGL008521)--Piedmont analogue of CEGL006269; has more *Quercus prinus*, less *Quercus falcata*, and lacks *Gaylussacia frondosa* and other species more characteristic of the Coastal Plain.

Related Concepts:

- *Quercus alba* - *Quercus falcata* - (*Pinus taeda*) / *Gaylussacia frondosa* Forest (Fleming pers. comm.) =
- *Quercus alba* - *Quercus velutina* - *Quercus coccinea* / *Gaylussacia baccata* - *Vaccinium stamineum* Forest (VDNH 2003) =
- Dry Oak-Pine Forest, mixed oak-pine forest subtype (Breden 1989) ?
- Pine - oak association (Shreve et al. 1910) B

SOURCES

Description Authors: G. P. Fleming, mod. L. A. Sneddon.

References: Breden 1989, Breden et al. 2001, Eastern Ecology Working Group n.d., Fleming et al. 2001, Fleming pers. comm., Harrison 2004, Shreve et al. 1910, Sneddon et al. 1996, VDNH 2003.



Figure I8. Coastal Plain Mixed Oak / Heath Forest (plot PETE.1) at Petersburg National Battlefield. July 2004. NAD 1983 / UTM easting 290712, northing 4123087.



Figure I9. Coastal Plain Mixed Oak / Heath Forest (plot PETE.5) at Petersburg National Battlefield. September 2005. NAD 1983 / UTM easting 267343, northing 4113216.

**COMMON NAME (PARK-SPECIFIC): COASTAL PLAIN / PIEDMONT SMALL-
STREAM FLOODPLAIN FOREST**

SYNONYMS

NVC English Name: Sweetgum - Tuliptree / Northern Spicebush / Jack-in-the-Pulpit Forest

NVC Scientific Name: *Liquidambar styraciflua* - *Liriodendron tulipifera* / *Lindera benzoin* / *Arisaema triphyllum* Forest

NVC Identifier: CEG004418

LOCAL INFORMATION

Environmental Description: Coastal Plain / Piedmont Small-Stream Floodplain Forest is a deciduous forest found on small floodplains and floodplain terraces of Poor Creek, Harrison Creek, and Hatcher Run. Because of the increased runoff from the surrounding urbanized landscape, these streams are often deeply entrenched and have sediment deposits on the banks and stream channel.

Vegetation Description: The canopy is dominated by *Acer rubrum* (red maple), *Liriodendron tulipifera* (tuliptree), and/or *Liquidambar styraciflua* (sweetgum), occurring singly or in various combinations. Typical floodplain associates, such as *Betula nigra* (river birch), *Fraxinus pennsylvanica* (green ash), *Juglans nigra* (black walnut), *Platanus occidentalis* (American sycamore), and *Ulmus americana* (American elm), are also in the canopy and subcanopy. *Pinus taeda* (loblolly pine) and *Quercus phellos* (willow oak) may be present with low cover. Vines such as *Campsis radicans* (trumpet creeper), *Toxicodendron radicans* (eastern poison ivy), *Vitis vulpina* (frost grape), *Vitis labrusca* (fox grape), and the exotic *Lonicera japonica* (Japanese honeysuckle) are commonly found climbing into the canopy trees. Typical species of the shrub layer are *Carpinus caroliniana* (American hornbeam), *Ilex opaca* var. *opaca* (American holly), *Lindera benzoin* (northern spicebush), *Liquidambar styraciflua* (sweetgum), and *Ulmus americana* (American elm). The herb layer in the disturbed floodplain forests of Petersburg National Battlefield is often a carpet of the exotic grass *Microstegium vimineum* (Nepalese browntop) with a scattering of other native herbs typical of floodplain habitats. Forbs such as *Amphicarpaea bracteata* (American hogpeanut), *Arisaema triphyllum* (Jack in the pulpit), *Boehmeria cylindrica* (smallspike false nettle), *Geum virginianum* (cream avens), *Polygonum virginianum* (jumpseed), and *Verbesina alternifolia* (wingstem); grasses and sedges such as *Carex debilis* (white edge sedge), *Chasmanthium laxum* (slender woodoats), *Cinna arundinacea* (sweet woodreed), and *Dichantherium clandestinum* (deertongue); and ferns such as *Athyrium filix-femina* (common ladyfern), *Osmunda cinnamomea* (cinnamon fern), *Polystichum acrostichoides* (Christmas fern), *Thelypteris noveboracensis* (New York fern), *Woodwardia areolata* (netted chainfern) can be found in these floodplain forests.

Canopy dominants can vary from stand to stand but always include at least some of the typical floodplain species mentioned above. One area in the Main Unit of Petersburg National Battlefield that was formerly a pond, but is now drained and succeeding back into forest, is included in the Coastal Plain / Piedmont Small-Stream Floodplain Forest map class.

Most Abundant Species:

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Acer rubrum</i> (red maple), <i>Liquidambar styraciflua</i> (sweetgum)
Tree subcanopy	Broad-leaved deciduous tree	<i>Carpinus caroliniana</i> (American hornbeam)

Characteristic Species: *Acer rubrum* (red maple), *Boehmeria cylindrica* (smallspike false nettle), *Carpinus caroliniana* (American hornbeam), *Cinna arundinacea* (sweet woodreed), *Liquidambar styraciflua* (sweetgum), *Platanus occidentalis* (American sycamore), *Ulmus americana* (American elm).

Other Noteworthy Species:

<u>Species</u>	<u>GRank</u>	<u>Type</u>	<u>Note</u>
<i>Microstegium vimineum</i> (Nepalese browntop)	-	plant	invasive nonnative

Subnational Distribution with Crosswalk Data:

<u>State</u>	<u>SRank</u>	<u>Rel</u>	<u>Conf</u>	<u>SName</u>	<u>Reference</u>
VA	SNR*	B	I	Coastal Plain / Piedmont Floodplain Forest	.

Local Range: Coastal Plain / Piedmont Small-Stream Floodplain Forest is mapped as 30 hectares (74 acres) in the Eastern Front (Main Unit) and at Five Forks Battlefield. It is found along Poor Creek, Harrison Creek, and Hatcher Run.

Classification Comments: This community is distinguished by its temporarily flooded hydrology and by occurring on floodplains of small creeks and streams.

Other Comments: Information not available.

Local Description Authors: K. D. Patterson.

Plots: PETE.2.

Petersburg National Battlefield Inventory Notes: Information not available.

GLOBAL INFORMATION

NVC CLASSIFICATION

Physiognomic Class	Forest (I)
Physiognomic Subclass	Deciduous forest (I.B.)
Physiognomic Group	Cold-deciduous forest (I.B.2.)
Physiognomic Subgroup	Natural/Semi-natural cold-deciduous forest (I.B.2.N.)
Formation	Temporarily flooded cold-deciduous forest (I.B.2.N.d.)
Alliance	<i>Liquidambar styraciflua</i> - (<i>Liriodendron tulipifera</i> , <i>Acer rubrum</i>) Temporarily Flooded Forest Alliance (A.287)
Alliance (English name)	Sweetgum - (Tuliptree, Red Maple) Temporarily Flooded Forest Alliance
Association	<i>Liquidambar styraciflua</i> - <i>Liriodendron tulipifera</i> / <i>Lindera benzoin</i> / <i>Arisaema triphyllum</i> Forest
Association (English name)	Sweetgum - Tuliptree / Northern Spicebush / Jack-in-the-Pulpit Forest
Ecological System(s):	Northern Atlantic Coastal Plain Stream and River (CES203.070). Southern Piedmont Small Floodplain and Riparian Forest (CES202.323).

GLOBAL DESCRIPTION

Concept Summary: These low-elevation forests develop along relatively acidic soils on small streams in the Coastal Plain of Maryland and Virginia, extending west across the Virginia and North Carolina Piedmont to the Cumberland Plateau and Ridge and Valley. The topographic features of floodplains can heavily influence the individual makeup of examples of this association. The canopy, subcanopy, shrub, and herbaceous layers often are well-developed. Dominant canopy species always include *Liquidambar styraciflua* (sweetgum) and *Liriodendron tulipifera* (tuliptree), while *Acer barbatum* (southern sugar maple) and *Acer rubrum* var. *rubrum* (red maple) may also make up significant amounts of the canopy. This community type exists as

a continuum between two subtypes, i.e., the tuliptree subtype and the sweetgum subtype. In some examples, only one or the other dominates the canopy. However, in many examples, both are equally dominant. Common species in the canopy and understory include *Ilex opaca* var. *opaca* (American holly), *Aesculus sylvatica* (painted buckeye), *Carpinus caroliniana* ssp. *caroliniana* (American hornbeam), *Cornus florida* (flowering dogwood), *Fagus grandifolia* (American beech), *Juglans nigra* (black walnut), *Morus rubra* var. *rubra* (red mulberry), *Ostrya virginiana* var. *virginiana* (hophornbeam), *Oxydendrum arboreum* (sourwood), *Pinus echinata* (shortleaf pine), *Prunus serotina* var. *serotina* (black cherry), *Quercus alba* (white oak), *Quercus rubra* var. *rubra* (northern red oak), *Ulmus rubra* (slippery elm), *Ulmus americana* (American elm), *Ulmus alata* (winged elm), *Juniperus virginiana* var. *virginiana* (eastern redcedar), *Nyssa sylvatica* (blackgum), *Fraxinus americana* (white ash), *Halesia tetraptera* var. *tetraptera* (mountain silverbell), *Arundinaria gigantea* ssp. *gigantea* (giant cane), *Cornus florida* (flowering dogwood), *Platanus occidentalis* (American sycamore), *Betula nigra* (river birch), and *Fraxinus pennsylvanica* (green ash). *Euonymus americanus* (strawberry bush), *Lindera benzoin* var. *benzoin* (northern spicebush), and *Corylus americana* (American hazelnut) are common and dominant in the shrub layer. The herbaceous layer is species-rich and often has good sedge development. The exotics *Microstegium vimineum* (Nepalese browntop), *Ligustrum sinense* (Chinese privet), and *Lonicera japonica* (Japanese honeysuckle) are common in this community.

Environmental Description: These forests develop along small streams. Soils are relatively acidic and relatively well-drained. Topographic differences from one floodplain to another, such as gradient and height above the creek, as well as floodplain microtopography (i.e., depositional landforms such as natural levees and sloughs) may influence the variation of vegetation within this association. However, in most floodplains supporting this type, the distinct alluvial landforms are poorly developed or occur at very small scales.

Vegetation Description: The canopy, subcanopy, shrub, and herbaceous layers of stands of this association are often well-developed. Dominant canopy species always include *Liquidambar styraciflua* (sweetgum) and *Liriodendron tulipifera* (tuliptree), while *Acer barbatum* (southern sugar maple) (in the southern part of the range) and *Acer rubrum* var. *rubrum* (red maple) may also make up significant amounts of the canopy. This community type exists as a continuum between two subtypes, i.e., the tuliptree subtype and the sweetgum subtype. In some examples, only one or the other dominates the canopy. However, in many examples, both are equally dominant. Other common species in the canopy and understory include *Ilex opaca* var. *opaca* (American holly), *Aesculus sylvatica* (painted buckeye), *Carpinus caroliniana* ssp. *caroliniana* (American hornbeam), *Cornus florida* (flowering dogwood), *Fagus grandifolia* (American beech), *Juglans nigra* (black walnut), *Morus rubra* var. *rubra* (red mulberry), *Ostrya virginiana* var. *virginiana* (hophornbeam), *Oxydendrum arboreum* (sourwood), *Pinus echinata* (shortleaf pine), *Prunus serotina* var. *serotina* (black cherry), *Quercus alba* (white oak), *Quercus rubra* var. *rubra* (northern red oak), *Ulmus rubra* (slippery elm), *Ulmus americana* (American elm), *Ulmus alata* (winged elm), *Juniperus virginiana* var. *virginiana* (eastern redcedar), *Nyssa sylvatica* (blackgum), *Fraxinus americana* (white ash), *Halesia tetraptera* var. *tetraptera* (mountain silverbell), *Arundinaria gigantea* ssp. *gigantea* (giant cane), and *Fraxinus pennsylvanica* (green ash). Scattered individuals of *Platanus occidentalis* (American sycamore) and *Betula nigra* (river birch) may also occur in some stands. *Euonymus americanus* (strawberry bush), *Lindera benzoin* var. *benzoin* (northern spicebush), and *Corylus americana* (American hazelnut) are common and dominant in the shrub layer. Other shrub species that may be present

include *Viburnum acerifolium* (mapleleaf viburnum), *Viburnum nudum* var. *nudum* (possumhaw), *Viburnum prunifolium* (blackhaw), *Viburnum rufidulum* (rusty blackhaw), *Hamamelis virginiana* (American witchhazel), *Asimina triloba* (pawpaw), and *Ilex decidua* (possumhaw), among others. On the most acidic sites of the Maryland Coastal Plain, *Clethra alnifolia* (coastal sweetpepperbush), *Vaccinium corymbosum* (highbush blueberry), and *Magnolia virginiana* (sweetbay) may be present. Vines are prominent and include *Vitis rotundifolia* (muscadine), *Apios americana* (groundnut), *Campsis radicans* (trumpet creeper), *Aristolochia macrophylla* (pipevine), *Bignonia capreolata* (crossvine), *Dioscorea quaternata* (fourleaf yam), *Gelsemium sempervirens* (evening trumpetflower), *Parthenocissus quinquefolia* (Virginia creeper), *Campsis radicans* (trumpet creeper), *Passiflora lutea* (yellow passionflower), *Smilax bona-nox* (saw greenbrier), *Smilax glauca* (cat greenbrier), *Smilax hugeri* (Huger's carrionflower), *Smilax rotundifolia* (roundleaf greenbrier), and *Toxicodendron radicans* ssp. *radicans* (eastern poison ivy). The herbaceous layer is species-rich and often has good sedge development. Common species in this layer include *Thalictrum thalictroides* (rue anemone), *Trillium cuneatum* (little sweet Betsy), *Arisaema triphyllum* (Jack in the pulpit), *Asplenium platyneuron* var. *platyneuron* (ebony spleenwort), *Botrychium virginianum* (rattlesnake fern), *Carex* spp. (sedges), *Carex impressinervia* (ravine sedge), *Carex striatula* (lined sedge), *Cinna arundinacea* (sweet woodreed), *Elymus virginicus* (Virginia wildrye), *Galium circaezans* (licorice bedstraw), *Geum canadense* (white avens), *Medeola virginiana* (Indian cucumber), *Polystichum acrostichoides* (Christmas fern), and *Scutellaria integrifolia* (helmet flower), among many others. *Thelypteris noveboracensis* (New York fern) is a common patch-dominant in the northern part of the range and the Uwharrie Mountains of North Carolina. The exotics *Microstegium vimineum* (Nepalese browntop), *Ligustrum sinense* (Chinese privet), and *Lonicera japonica* (Japanese honeysuckle) are common in this community. Other exotics that colonize quickly in disturbed and fragmented versions of this association include *Wisteria sinensis* (Chinese wisteria), *Rosa multiflora* (multiflora rose), *Clematis terniflora* (sweet autumn virginsbower), *Hedera helix* (English ivy), and *Elaeagnus* sp. (an elaeagnus).

Most Abundant Species:

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Liquidambar styraciflua</i> (sweetgum), <i>Liriodendron tulipifera</i> (tuliptree)

Characteristic Species: *Arisaema triphyllum* (Jack in the pulpit), *Asplenium platyneuron* (ebony spleenwort), *Botrychium virginianum* (rattlesnake fern), *Campsis radicans* (trumpet creeper), *Carex striatula* (lined sedge), *Cinna arundinacea* (sweet woodreed), *Corylus americana* (American hazelnut), *Elymus virginicus* (Virginia wildrye), *Euonymus americanus* (strawberry bush), *Galium circaezans* (licorice bedstraw), *Geum canadense* (white avens), *Lindera benzoin* (northern spicebush), *Liquidambar styraciflua* (sweetgum), *Liriodendron tulipifera* (tuliptree), *Medeola virginiana* (Indian cucumber), *Polystichum acrostichoides* (Christmas fern), *Scutellaria integrifolia* (helmet flower), *Smilax rotundifolia* (roundleaf greenbrier), *Thalictrum thalictroides* (rue anemone), *Toxicodendron radicans* (eastern poison ivy), *Trillium cuneatum* (little sweet Betsy)

Other Noteworthy Species:

<u>Species</u>	<u>GRank</u>	<u>Type</u>	<u>Note</u>
<i>Carex impressinervia</i> (ravine sedge)	G1G2	plant	

USFWS Wetland System: Palustrine.

DISTRIBUTION

Range: This association is found in the Chesapeake Bay Lowlands, the Piedmont, and other low-elevation interior ecoregions (e.g., parts of the Cumberland Plateau and Ridge and Valley). It is defined as being absent from the Mid-Atlantic Coastal Plain of southeastern Virginia, the Carolinas, and Georgia. Its status in the Upper East Gulf Coastal Plain is unknown.

States/Provinces: GA, MD, NC, SC?, TN, VA.

Federal Lands: DOD (Fort Belvoir); NPS (Chickamauga-Chattanooga, Colonial, Cowpens, Fredericksburg-Spotsylvania, Guilford Courthouse, Kings Mountain, National Capital-East, Petersburg, Prince William, Richmond, Thomas Stone); USFS (Uwharrie).

CONSERVATION STATUS

Rank: G4 (15-Feb-2007).

Reasons: This community is widespread from the Coastal Plain of Maryland and Virginia through the Piedmont of Virginia and North Carolina to the Cumberland Plateau. Very few streams supporting this type have impoundments or diversions, and most are protected by wetland regulations. However, few, if any, pristine examples remain, and all are highly threatened by invasive exotic species that have colonized most of the remaining examples of this association.

CLASSIFICATION INFORMATION

Status: Standard.

Confidence: 3 - Weak.

Comments: At Chickamauga-Chattanooga National Military Park, this association was observed on Lookout Creek, but no plot data were taken. Low-quality occurrences of this type may look very similar to some occurrences of *Liquidambar styraciflua* - (*Liriodendron tulipifera*) Temporarily Flooded Forest (CEGL007330). The presence of higher quality patches of native herbs and stands of native shrubs such as *Lindera benzoin* (northern spicebush) is the best way to distinguish these two types. In addition, stands of CEGL007330 will generally be more even-aged and single species-dominated than this association (CEGL004418).

Similar Associations:

- *Liquidambar styraciflua* - (*Liriodendron tulipifera*) Temporarily Flooded Forest (CEGL007330)--occurs in the same habitat but is a highly impacted version of this forest that occurs on old farm fields and other second-growth areas.
- *Liquidambar styraciflua* Forest (CEGL007216).
- *Liriodendron tulipifera* - *Acer (rubrum, negundo)* - (*Platanus occidentalis*) / *Carpinus caroliniana* / *Polygonum virginianum* Forest (CEGL006492).

Related Concepts:

- *Liquidambar styraciflua* - *Quercus palustris* / *Carpinus caroliniana* / *Carex intumescens* Forest (Meininger and McCarthy 1998) ?
- Maple-Gum Association of the Western Shore District (Shreve et al. 1910) B

SOURCES

Description Authors: R. K. Peet, mod. R. White, M. Pyne, G. P. Fleming.

References: Fleming et al. 2001, Meininger and McCarthy 1998, Naczi et al. 2002, Peet et al. unpubl. data 2002, Schafale and Weakley 1990, Shreve et al. 1910, Southeastern Ecology Working Group n.d.



Figure I10. Coastal Plain / Piedmont Small-Stream Floodplain Forest (plot PETE.2) at Petersburg National Battlefield. August 2004. NAD 1983 / UTM easting 268009, northing 4114959.



Figure II 1. Coastal Plain / Piedmont Small-Stream Floodplain Forest (disturbed) at Petersburg National Battlefield. July 2004. NAD 1983 / UTM easting 290310, northing 4122667. Note dominance by Nepalese browntop (*Microstegium vimineum*).

COMMON NAME (PARK-SPECIFIC): COASTAL PLAIN / PIEDMONT FLOODPLAIN SWAMP FOREST (MIXED OAK - RED MAPLE TYPE)

SYNONYMS

NVC English Name: (Willow Oak, Pin Oak, Swamp Chestnut Oak) - Sweetgum / Sweet Woodreed Forest
NVC Scientific Name: *Quercus (phellos, palustris, michauxii)* - *Liquidambar styraciflua* / *Cinna arundinacea* Forest
NVC Identifier: C EGL006605

LOCAL INFORMATION

Environmental Description: Coastal Plain / Piedmont Floodplain Swamp Forest (Mixed Oak - Red Maple Type) is a mainly deciduous forest occurring on broad, seasonally flooded flats. In Petersburg National Battlefield, these areas may have formerly been portions of the active floodplain, but are now isolated due to urban development and are never inundated by alluvial floodwaters. Some areas have evidence of historic ditching with remnants of human-made berms.

Vegetation Description: Coastal Plain / Piedmont Floodplain Swamp Forest (Mixed Oak - Red Maple Type) is dominated by mixtures of *Quercus phellos* (willow oak), *Acer rubrum* (red maple), *Liquidambar styraciflua* (sweetgum), and *Pinus taeda* (loblolly pine). Other trees that may be found in the canopy and subcanopy are *Ulmus americana* (American elm) and *Nyssa sylvatica* (blackgum). The shrub layers tend to be very open, but *Smilax rotundifolia* (roundleaf greenbrier) may form thickets locally and *Toxicodendron radicans* (eastern poison ivy) often climbs into the canopy. The topography is flat overall but may have wet depressions with standing water. The ground may be mostly bare, covered with matted leaf litter and mud, with scattered patches of wetland grasses and sedges. *Carex debilis* var. *debilis* (white edge sedge), *Chasmanthium laxum* (slender woodoats), *Juncus effusus* (common rush), and the exotic grass *Microstegium vimineum* (Nepalese browntop) are the most common herbaceous species, although many others may occur. Typical herbaceous species include *Carex crinita* (fringed sedge), *Carex festucacea* (fescue sedge), *Carex lurida* (shallow sedge), *Carex seorsa* (weak stellate sedge), *Carex stipata* (owlfruit sedge), *Carex tribuloides* (blunt broom sedge), *Cinna arundinacea* (sweet woodreed), *Glyceria striata* (fowl mannagrass), *Leersia virginica* (whitegrass), and *Symphotrichum lateriflorum* var. *lateriflorum* (calico aster). *Sphagnum* sp. (a sphagnum moss) may have cover in wet depressions, and mosses cover lower tree trunks and fallen logs.

Relative dominance of the canopy species may vary from stand to stand. Some stands are dominated by large *Quercus phellos* (willow oak), while others have more stems of *Acer rubrum* (red maple) or *Liquidambar styraciflua* (sweetgum). *Pinus taeda* (loblolly pine) may have high cover locally within a polygon mapped as this forest.

Most Abundant Species:

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Needle-leaved tree	<i>Pinus taeda</i> (loblolly pine)
Tree canopy	Broad-leaved deciduous tree	<i>Quercus phellos</i> (willow oak)
Shrub/sapling (tall & short)	Vine/Liana	<i>Smilax rotundifolia</i> (roundleaf greenbrier)

Characteristic Species: *Carex debilis* var. *debilis* (white edge sedge), *Quercus phellos* (willow oak), *Smilax rotundifolia* (roundleaf greenbrier).

Other Noteworthy Species:

<u>Species</u>	<u>GRank</u>	<u>Type</u>	<u>Note</u>
<i>Microstegium vimineum</i> (Nepalese browntop)	-	plant	invasive nonnative

Subnational Distribution with Crosswalk Data:

<u>State</u>	<u>SRank</u>	<u>Rel</u>	<u>Conf</u>	<u>SName</u>	<u>Reference</u>
VA	SNR*	B	1	Coastal Plain / Piedmont Swamp Forest	.

Local Range: Coastal Plain / Piedmont Floodplain Swamp Forest (Mixed Oak - Red Maple Type) is mapped as two isolated polygons in the Eastern Front (Main Unit) of Petersburg National Battlefield. It covers 22 hectares (54 acres).

Classification Comments: This forest is distinguished by its seasonally flooded hydrology and its occurrence on broad flats with seasonally flooded to saturated soils. Most stands are dominated by *Quercus phellos* (willow oak) or have *Quercus phellos* (willow oak) as a component. Unlike Coastal Plain / Piedmont Small-Stream Floodplain Forest, this forest is not associated with active floodplains and is located well away from the main stream channel.

Other Comments: The forests mapped as Coastal Plain / Piedmont Floodplain Swamp Forest (Mixed Oak Red Maple Type) in Petersburg National Battlefield may have been influenced by past land use that altered the natural hydrology of the site. The site shows evidence of historic ditching and has artificial berms. The stands are currently seasonally flooded and isolated from any fluvial activity. It is unclear what the historical hydrology was, but the forest may have once been part of the Appomattox River floodplain.

Local Description Authors: K. D. Patterson.

Plots: PETE.9.

Petersburg National Battlefield Inventory Notes: Information not available.

GLOBAL INFORMATION

NVC CLASSIFICATION

Physiognomic Class	Forest (I)
Physiognomic Subclass	Deciduous forest (I.B.)
Physiognomic Group	Cold-deciduous forest (I.B.2.)
Physiognomic Subgroup	Natural/Semi-natural cold-deciduous forest (I.B.2.N.)
Formation	Seasonally flooded cold-deciduous forest (I.B.2.N.e.)
Alliance	<i>Quercus (phellos, laurifolia)</i> Seasonally Flooded Forest Alliance (A.327)
Alliance (English name)	(Willow Oak, Diamondleaf Oak) Seasonally Flooded Forest Alliance
Association	<i>Quercus (phellos, palustris, michauxii)</i> - <i>Liquidambar styraciflua</i> / <i>Cinna arundinacea</i> Forest
Association (English name)	(Willow Oak, Pin Oak, Swamp Chestnut Oak) - Sweetgum / Sweet Woodreed Forest
Ecological System(s):	Central Appalachian Stream and Riparian (CES202.609). Central Appalachian River Floodplain (CES202.608). Atlantic Coastal Plain Small Brownwater River Floodplain Forest (CES203.250). Atlantic Coastal Plain Brownwater Stream Floodplain Forest (CES203.248). Northern Atlantic Coastal Plain Stream and River (CES203.070).

GLOBAL DESCRIPTION

Concept Summary: This floodplain swamp forest occurs in backswamps and topographic depressions within alluvial floodplains of large streams and small rivers. Along smaller headwater streams, it may occur in low, poorly drained floodplains with braided channels and depressions. Standing water is present for much of the year on loam or clay loam soils. The

overstory is dominated by variable mixtures of *Quercus phellos* (willow oak), *Quercus palustris* (pin oak), *Quercus michauxii* (swamp chestnut oak), *Liquidambar styraciflua* (sweetgum), and *Acer rubrum* (red maple). The proportion of the latter two species typically increases with disturbance. The understory is commonly quite open and contains young *Acer rubrum* (red maple), several climbing vines, *Carpinus caroliniana* (American hornbeam), *Ilex opaca* var. *opaca* (American holly), *Asimina triloba* (pawpaw), *Viburnum dentatum* (southern arrowwood), *Ilex verticillata* (common winterberry), and other species. The herb layer is usually well-developed, with a prominent graminoid component. Common herbaceous patch-dominants include *Cinna arundinacea* (sweet woodreed), *Carex debilis* var. *debilis* (white edge sedge), *Carex intumescens* (greater bladder sedge), *Glyceria striata* (fowl mannagrass), and *Carex tribuloides* (blunt broom sedge).

Environmental Description: This floodplain swamp forest occurs in backswamps and topographic depressions within alluvial floodplains of large streams and small rivers. Along smaller headwater streams, it may occur in low, poorly drained floodplains with braided channels and depressions. Sites are probably overflowed annually, and depressions retain standing water well into the growing season. Soils are somewhat to very poorly drained loams or clay loams that are strongly to extremely acidic and infertile.

Vegetation Description: The overstory is dominated by variable mixtures of *Quercus phellos* (willow oak), *Quercus palustris* (pin oak), *Quercus michauxii* (swamp chestnut oak), *Liquidambar styraciflua* (sweetgum), and *Acer rubrum* (red maple). The proportion of the latter two species typically increases with disturbance. Other canopy associates include *Fraxinus pennsylvanica* (green ash), *Nyssa sylvatica* (blackgum), *Ulmus americana* (American elm), *Quercus pagoda* (cherrybark oak), *Quercus lyrata* (overcup oak), and *Betula nigra* (river birch). Climbing vines of *Smilax rotundifolia* (roundleaf greenbrier), *Parthenocissus quinquefolia* (Virginia creeper), *Toxicodendron radicans* (eastern poison ivy), and *Campsis radicans* (trumpet creeper) are common and characteristic. The subcanopy and shrub layers tend to be open and composed of young recruitment of *Acer rubrum* (red maple), along with *Carpinus caroliniana* (American hornbeam) (usually dominant), *Ilex opaca* var. *opaca* (American holly), *Asimina triloba* (pawpaw), *Euonymus americanus* (strawberry bush), *Viburnum dentatum* (southern arrowwood), *Ilex verticillata* (common winterberry), and *Lindera benzoin* (northern spicebush). The herb layer is usually well-developed, with a prominent graminoid component. Common herbaceous patch-dominants include *Cinna arundinacea* (sweet woodreed), *Carex debilis* var. *debilis* (white edge sedge), *Carex intumescens* (greater bladder sedge), *Glyceria striata* (fowl mannagrass), and *Carex tribuloides* (blunt broom sedge). Additional characteristic herbs include *Boehmeria cylindrica* (smallspike false nettle), *Arisaema triphyllum* (Jack in the pulpit), *Lycopus virginicus* (Virginia water horehound), *Athyrium filix-femina* ssp. *asplenioides* (asplenium ladyfern), *Impatiens capensis* (jewelweed), *Leersia virginica* (whitegrass), *Onoclea sensibilis* (sensitive fern), *Symphyotrichum lateriflorum* (calico aster), and *Rubus hispidus* (bristly dewberry). Many other species occur at low constancy and cover. Mean species richness of 47 Maryland and Virginia plot samples was 38 taxa per 400 square meters.

Most Abundant Species:

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Acer rubrum</i> (red maple), <i>Liquidambar styraciflua</i> (sweetgum), <i>Quercus michauxii</i> (swamp chestnut oak), <i>Quercus palustris</i> (pin oak), <i>Quercus phellos</i> (willow oak)

Tree subcanopy	Broad-leaved deciduous tree	<i>Acer rubrum</i> (red maple), <i>Carpinus caroliniana</i> (American hornbeam)
Shrub/sapling (tall & short)	Vine/Liana	<i>Campsis radicans</i> (trumpet creeper), <i>Parthenocissus quinquefolia</i> (Virginia creeper), <i>Smilax rotundifolia</i> (roundleaf greenbrier), <i>Toxicodendron radicans</i> (eastern poison ivy)
Herb (field)	Graminoid	<i>Carex debilis</i> var. <i>debilis</i> (white edge sedge), <i>Carex intumescens</i> (greater bladder sedge), <i>Carex tribuloides</i> (blunt broom sedge), <i>Cinna arundinacea</i> (sweet woodreed), <i>Glyceria striata</i> (fowl mannagrass)

Characteristic Species: *Acer rubrum* (red maple), *Campsis radicans* (trumpet creeper), *Carex debilis* var. *debilis* (white edge sedge), *Carex intumescens* (greater bladder sedge), *Carex tribuloides* (blunt broom sedge), *Carpinus caroliniana* (American hornbeam), *Cinna arundinacea* (sweet woodreed), *Glyceria striata* (fowl mannagrass), *Liquidambar styraciflua* (sweetgum), *Parthenocissus quinquefolia* (Virginia creeper), *Quercus michauxii* (swamp chestnut oak), *Quercus palustris* (pin oak), *Quercus phellos* (willow oak), *Smilax rotundifolia* (roundleaf greenbrier), *Toxicodendron radicans* (eastern poison ivy).

Other Noteworthy Species: Information not available.

USFWS Wetland System: Palustrine.

DISTRIBUTION

Range: This community is found in the Chesapeake Bay region. It is most characteristic of the Coastal Plain but also extends into the extreme eastern part of the Piedmont.

States/Provinces: DE?, MD, NJ, PA, VA.

Federal Lands: DOD (Fort Belvoir); NPS (Fredericksburg-Spotsylvania, National Capital-East, Petersburg, Prince William).

CONSERVATION STATUS

Rank: G3G4 (23-Feb-2007).

Reasons: This is a moderately-well-distributed forest type. Some examples are at least partly protected in national parks. More information on threats is needed.

CLASSIFICATION INFORMATION

Status: Standard.

Confidence: 2 - Moderate.

Comments: This association is supported by analysis of a 1,250-plot regional dataset assembled for the NCR and mid-Atlantic national parks vegetation mapping project. In that analysis, this type was represented by a group of 37 Maryland and 10 northern Virginia plots.

Similar Associations:

- *Quercus phellos* - *Quercus (palustris, lyrata)* / *Ilex decidua* / *Carex typhina* - (*Carex grayi*) Forest (CEGL006498).

Related Concepts:

- *Acer rubrum* - *Liquidambar styraciflua* - *Quercus (palustris, phellos)* Seasonally Flooded Forest (Patterson pers. comm.) ?

SOURCES

Description Authors: D. Thompson and L. A. Sneddon, mod. G. P. Fleming.

References: Eastern Ecology Working Group n.d., Fleming et al. 2001, Harrison 2004, Harrison and Stango 2003, Patterson pers. comm., Thomson et al. 1999.



Figure I12. Coastal Plain / Piedmont Floodplain Swamp Forest (Mixed Oak - Red Maple Type) (plot PETE.9) at Petersburg National Battlefield. May 2006. NAD 1983 / UTM easting 290622, northing 4124309.

**COMMON NAME (PARK-SPECIFIC): COASTAL PLAIN / PIEDMONT ACIDIC
SEEPAGE SWAMP**

SYNONYMS

NVC English Name: Red Maple - Blackgum - Sweetbay / Southern Wild Raisin /
Cinnamon Fern - Netted Chainfern Forest

NVC Scientific Name: *Acer rubrum* - *Nyssa sylvatica* - *Magnolia virginiana* / *Viburnum
nudum* var. *nudum* / *Osmunda cinnamomea* - *Woodwardia
areolata* Forest

NVC Identifier: C EGL006238

LOCAL INFORMATION

Environmental Description: Coastal Plain / Piedmont Acidic Seepage Swamp occurs as narrow features in small headwaters, stream bottoms and draws. It is found at the base of seeping toeslopes where seepage discharged at the ground surface is drained away as streamflow. These saturated, deciduous forests have acidic, nutrient-poor soils and are characterized by diffuse drainage with braided channels and *Sphagnum* (sphagnum)-covered hummocks in a sandy or peaty substrate. These habitats are generally wet and somewhat protected from fire. Late in the growing season and during periods of drought, these seepage wetlands can appear quite dry.

Vegetation Description: Dominant overstory species can include *Acer rubrum* (red maple), *Nyssa sylvatica* (blackgum), *Liquidambar styraciflua* (sweetgum), and occasionally, *Fraxinus pennsylvanica* (green ash). Other species that occur in the canopy in lesser amounts include *Liriodendron tulipifera* (tuliptree), and *Quercus phellos* (willow oak). *Magnolia virginiana* (sweetbay) is common to dominant in the subcanopy and tall-shrub layers. *Clethra alnifolia* (coastal sweetpepperbush) dominates the short-shrub layer and is often very dense. Other common and characteristic shrubs include *Ilex opaca* var. *opaca* (American holly), *Ilex verticillata* (common winterberry), *Leucothoe racemosa* (swamp doghobble), *Lindera benzoin* (northern spicebush), *Rhododendron viscosum* (swamp azalea), *Rubus flagellaris* (northern dewberry), *Smilax rotundifolia* (roundleaf greenbrier), *Vaccinium corymbosum* (highbush blueberry), *Vaccinium formosum* (southern blueberry), *Vaccinium fuscatum* (black highbush blueberry), *Viburnum dentatum* var. *dentatum* (southern arrowwood), and *Viburnum nudum* (possumhaw). The herb stratum is a dense mixture of graminoids, ferns, and forbs. Many examples are very rich in *Carex* (sedge) species. Characteristic sedges include *Carex abscondita* (thicket sedge), *Carex albolutescens* (greenwhite sedge), *Carex atlantica* ssp. *atlantica* (prickly bog sedge), *Carex crinita* (fringed sedge), *Carex debilis* var. *debilis* (white edge sedge), *Carex festucacea* (fescue sedge), *Carex intumescens* (greater bladder sedge), *Carex leptalea* (bristlystalked sedge), *Carex lonchocarpa* (southern long sedge), *Carex seorsa* (weak stellate sedge), and *Carex styloflexa* (bent sedge). Other graminoid species include *Chasmanthium laxum* (slender woodoats), *Cinna arundinacea* (sweet woodreed), *Glyceria striata* (fowl mannagrass), *Leersia virginica* (whitegrass), and *Juncus effusus* (common rush). Common ferns are *Osmunda cinnamomea* (cinnamon fern), *Osmunda regalis* var. *spectabilis* (royal fern), and *Woodwardia areolata* (netted chainfern). Typical forbs include *Chelone glabra* (white turtlehead), *Gratiola virginiana* (roundfruit hedgehyssop), *Lobelia cardinalis* (cardinalflower), *Lycopus virginicus* (Virginia water horehound), *Medeola virginiana* (Indian cucumber), *Mitchella repens* (partridgeberry), *Oxypolis rigidior* (stiff cowbane), *Sambucus canadensis* (= *Sambucus nigra* ssp. *canadensis*, common elderberry), *Symphytotrichum lateriflorum* var. *lateriflorum* (calico

aster), *Viola cucullata* (marsh blue violet), and *Viola X primulifolia* (primroseleaf violet). Disturbed examples or examples with very dense shrub cover may lack herbaceous diversity. In some stands, *Pinus taeda* (loblolly pine) can occur as an open, emergent canopy.

Most Abundant Species:

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Acer rubrum</i> (red maple), <i>Nyssa sylvatica</i> (blackgum)

Characteristic Species: *Acer rubrum* (red maple), *Carex intumescens* (greater bladder sedge), *Lobelia cardinalis* (cardinalflower), *Magnolia virginiana* (sweetbay), *Nyssa sylvatica* (blackgum), *Viburnum nudum* (possumhaw).

Other Noteworthy Species: Information not available.

Subnational Distribution with Crosswalk Data:

<u>State</u>	<u>SRank</u>	<u>Rel</u>	<u>Conf</u>	<u>SName</u>	<u>Reference</u>
VA	S3?	=	I	Coastal Plain / Piedmont Acidic Seepage Swamp	Fleming et al. 2006

Local Range: Coastal Plain / Piedmont Acidic Seepage Swamp is mapped as 19 hectares (47 acres) in Five Forks Battlefield. Small areas of this type below minimum mapping unit may occur in the Eastern Front (Main Unit) where otherwise upland forest polygons cross small drainages.

Classification Comments: This community is distinguished from other wetlands in Petersburg National Battlefield by its distinctive species composition, its occurrence in narrow ravine and stream bottoms, and by a saturated hydrology. Other forested wetlands in Petersburg National Battlefield are associated with active, temporarily flooded small stream floodplains or large, saturated to seasonally flooded flats. In areas where Coastal Plain / Piedmont Acidic Seepage Swamp occurs adjacent to Coastal Plain / Piedmont Small-Stream Floodplain Forest, vegetation may be transitional between the two concepts.

Other Comments: High-quality examples of Coastal Plain / Piedmont Acidic Seepage Swamp are uncommon throughout the range of the association. Several uncommon odonates (dragonflies and damselflies) depend on forested seeps for breeding habitat. Throughout the range of the type, Coastal Plain / Piedmont Acidic Seepage Swamp is threatened by beaver activities, agricultural pollutants, hydrologic disturbances, and logging.

Local Description Authors: K. D. Patterson.

Plots: PETE.4, PETE.8.

Petersburg National Battlefield Inventory Notes: Information not available.

GLOBAL INFORMATION

NVC CLASSIFICATION

Physiognomic Class	Forest (I)
Physiognomic Subclass	Deciduous forest (I.B.)
Physiognomic Group	Cold-deciduous forest (I.B.2.)
Physiognomic Subgroup	Natural/Semi-natural cold-deciduous forest (I.B.2.N.)
Formation	Saturated cold-deciduous forest (I.B.2.N.g.)
Alliance	<i>Acer rubrum</i> - <i>Nyssa sylvatica</i> Saturated Forest Alliance (A.348)
Alliance (English name)	Red Maple - Blackgum Saturated Forest Alliance
Association	<i>Acer rubrum</i> - <i>Nyssa sylvatica</i> - <i>Magnolia virginiana</i> / <i>Viburnum nudum</i> var. <i>nudum</i> / <i>Osmunda cinnamomea</i> - Woodwardia areolata Forest
Association (English name)	Red Maple - Blackgum - Sweetbay / Southern Wild Raisin / Cinnamon Fern - Netted Chainfern Forest

Ecological System(s): Northern Atlantic Coastal Plain Basin Peat Swamp (CES203.522).
Northern Atlantic Coastal Plain Pitch Pine Lowland (CES203.374).
Northern Atlantic Coastal Plain Stream and River (CES203.070).

GLOBAL DESCRIPTION

Concept Summary: This acidic swamp forest of the eastern middle-latitude states is a nutrient-poor wetland forest occurring in groundwater-saturated stream bottoms and poorly drained depressions. Soils are typically moderately deep to deep muck over mineral soil, with pools of standing water at the surface. Acidic waters originate from groundwater seepage, with little to no overland seasonal flooding. Most sites can be characterized as "groundwater slope wetlands" (*sensu* Golet et al. 1993) with a flow-through hydrology. This community is characterized by *Acer rubrum* (red maple) and *Nyssa sylvatica* (blackgum) in the canopy, which may be quite open in some examples. Canopy associates include *Magnolia virginiana* (sweetbay), *Liquidambar styraciflua* (sweetgum), and *Persea palustris* (swamp bay), plus occasional incidental *Liriodendron tulipifera* (tuliptree) or *Pinus taeda* (loblolly pine). Upland trees may occur on drier hummocks. The shrub layer is characterized by *Vaccinium corymbosum* (highbush blueberry), as well as *Clethra alnifolia* (coastal sweetpepperbush), *Ilex verticillata* (common winterberry), *Ilex opaca* var. *opaca* (American holly), *Viburnum nudum* var. *nudum* (possumhaw), *Lindera benzoin* (northern spicebush), and *Rhododendron viscosum* (swamp azalea). The herbaceous layer varies from dense to sparse and may include *Symplocarpus foetidus* (skunk cabbage), *Triadenum virginicum* (Virginia marsh St. Johnswort), *Osmunda regalis* var. *spectabilis* (royal fern), *Woodwardia areolata* (netted chainfern), *Carex folliculata* (northern long sedge), *Carex lonchocarpa* (southern long sedge), *Carex collinsii* (Collins' sedge), *Carex atlantica* (prickly bog sedge), *Bartonia paniculata* (twining screwstem), *Parnassia asarifolia* (kidneyleaf grass of Parnassus), *Helonias bullata* (swamppink), *Chelone glabra* (white turtlehead), *Oxypolis rigidior* (stiff cowbane), and *Osmunda cinnamomea* (cinnamon fern). *Sphagnum* spp. (sphagnum mosses) and other mosses are common.

Environmental Description: This association is generally restricted to groundwater-saturated stream bottoms, seeping toeslopes, and poorly drained depressions with seepage inputs. Most sites can be characterized as "groundwater slope wetlands" (*sensu* Golet et al. 1993) with a flow-through hydrology. Sites typically have hummock-and-hollow microtopography with braided channels, *Sphagnum* (sphagnum)-covered hummocks, mucky depressions, and areas of exposed sand and gravel. Soils are extremely acidic and low in base status.

Vegetation Description: Canopy closure ranges from closed to quite open. Plot data from 38 Virginia and Maryland stands indicate that *Acer rubrum* (red maple) and *Nyssa sylvatica* (blackgum) are consistently dominant overstory species. *Liriodendron tulipifera* (tuliptree) is a frequent but minor overstory associate, and *Pinus taeda* or *Liquidambar styraciflua* is occasional in the canopy. *Magnolia virginiana* (sweetbay) is a frequent overstory associate and usually dominant in a subcanopy layer or codominant with *Ilex opaca* var. *opaca* (American holly). Trees tend to be slow-growing and of less than optimal stature in the wet, unstable habitats. Shrub layers tend to be dense and diverse, characteristically containing *Viburnum nudum* var. *nudum* (possumhaw), *Vaccinium corymbosum* (highbush blueberry), *Smilax rotundifolia* (roundleaf greenbrier), *Ilex verticillata* (common winterberry), and *Lindera benzoin* (northern spicebush). In parts of the range, *Clethra alnifolia* (coastal sweetpepperbush) is a dominant shrub, while in New Jersey, *Chamaedaphne calyculata* (leatherleaf) and *Gaylussacia frondosa* (blue huckleberry) are present. Additional, less constant shrub associates are *Rhododendron viscosum* (swamp azalea), *Leucothoe racemosa* (swamp doghobble), *Chionanthus virginicus* (white fringetree), *Viburnum dentatum* (southern arrowwood), *Toxicodendron vernix* (poison sumac), and *Carpinus*

caroliniana (American hornbeam). The herb layer varies from dense to sparse. *Osmunda cinnamomea* (cinnamon fern) and *Woodwardia areolata* (netted chainfern) are generally the most constant and abundant herbs, but *Symplocarpus foetidus* (skunk cabbage) is a patch-dominant in approximately two-thirds of the Virginia and Maryland stands. Additional characteristic herbs occurring at low cover include *Arisaema triphyllum* ssp. *pusillum* (Jack in the pulpit), *Carex atlantica* (prickly bog sedge), *Carex debilis* var. *debilis* (white edge sedge), *Carex folliculata* (northern long sedge), *Carex intumescens* (greater bladder sedge), *Carex lonchocarpa* (southern long sedge), *Carex seorsa* (weak stellate sedge), *Carex styloflexa* (bent sedge), *Chelone glabra* (white turtlehead), *Impatiens capensis* (jewelweed), *Lycopus virginicus* (Virginia water horehound), *Mitchella repens* (partridgeberry), *Osmunda regalis* var. *spectabilis* (royal fern), *Platanthera clavellata* (small green wood orchid), *Viola cucullata* (marsh blue violet), and *Viola X primulifolia* (primroseleaf violet). Regionally uncommon or rare species that may be locally abundant in this type include *Helonias bullata* (swamppink), *Parnassia asarifolia* (kidneyleaf grass of Parnassus), *Carex collinsii* (Collins' sedge), and *Bartonia paniculata* (twining screwstem).

Most Abundant Species:

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Acer rubrum</i> (red maple), <i>Liquidambar styraciflua</i> (sweetgum), <i>Nyssa sylvatica</i> (blackgum)
Tall shrub/sapling	Broad-leaved deciduous shrub	<i>Clethra alnifolia</i> (coastal sweetpepperbush), <i>Vaccinium corymbosum</i> (highbush blueberry)
Herb (field)	Fern or fern ally	<i>Osmunda cinnamomea</i> (cinnamon fern), <i>Osmunda regalis</i> (royal fern), <i>Woodwardia areolata</i> (netted chainfern)

Characteristic Species: *Acer rubrum* (red maple), *Magnolia virginiana* (sweetbay), *Nyssa sylvatica* (blackgum), *Osmunda cinnamomea* (cinnamon fern).

Other Noteworthy Species:

<u>Species</u>	<u>GRank</u>	<u>Type</u>	<u>Note</u>
<i>Helonias bullata</i> (swamppink)	G3	plant	

USFWS Wetland System: Palustrine.

DISTRIBUTION

Range: This community ranges from southeastern New York and New Jersey to southeastern Virginia on the Coastal Plain. In Virginia, it extends into the extreme eastern portion of the Piedmont.

States/Provinces: DC, DE, MD, NJ:S4S5, PA, VA:S3?

Federal Lands: DOD (Fort A.P. Hill, Fort Belvoir); NPS (Assateague Island, Fredericksburg-Spotsylvania, George Washington Birthplace, National Capital-East, Petersburg, Prince William, Richmond, Thomas Stone).

CONSERVATION STATUS

Rank: G3? (30-Mar-2004).

Reasons: The type is restricted to an uncommon wetland habitat in a limited region. It is vulnerable to alteration or destruction by beavers and various anthropogenic activities, including hydrologic modifications.

CLASSIFICATION INFORMATION

Status: Standard.

Confidence: 2 - Moderate.

Comments: Information not available.

Similar Associations:

- *Acer rubrum* - *Nyssa sylvatica* - *Betula alleghaniensis* / *Sphagnum* spp. Forest (CEGL006014).
- *Acer rubrum* - *Nyssa sylvatica* / *Ilex verticillata* - *Vaccinium fuscatum* / *Osmunda cinnamomea* Forest (CEGL007853).
- *Pinus taeda* / *Morella cerifera* / *Osmunda regalis* var. *spectabilis* Forest (CEGL006137).

Related Concepts:

- *Acer rubrum* - *Nyssa sylvatica* - *Magnolia virginiana* / *Viburnum nudum* var. *nudum* / *Osmunda cinnamomea* - *Woodwardia areolata* Forest (Fleming pers. comm.) =
- *Acer rubrum* - *Nyssa sylvatica* / *Magnolia virginiana* / *Woodwardia areolata* - *Symplocarpus foetidus* Saturated Forest (Patterson pers. comm.) ?
- *Acer rubrum* - *Quercus nigra* - *Nyssa sylvatica* swamp (Harvill 1967) ?
- Broadleaf swamp forest (Heckscher 1994) ?
- Cape May lowland swamp (Breden 1989) B
- Inland red maple swamp (Breden 1989) ?
- Pine barrens hardwood swamp (Breden 1989) B
- Woodland fresh marsh community (Hill 1986) ?

SOURCES

Description Authors: G. Fleming.

References: Breden 1989, Breden et al. 2001, Eastern Ecology Working Group n.d., Ehrenfeld and Gulick 1981, Fike 1999, Fleming et al. 2001, Fleming pers. comm., Golet et al. 1993, Harrison 2004, Harrison and Stango 2003, Harvill 1967, Heckscher 1994, Hill 1986, McCormick 1979, Patterson pers. comm., Robichaud and Buell 1973, Sipple and Klockner 1984, VDNH 2003, Windisch 1995.



Figure I13. Coastal Plain / Piedmont Acidic Seepage Swamp (plot PETE. 4) at Petersburg National Battlefield. June 2005. NAD 1983 / UTM easting, 267829, northing 4113423.



Figure I14. Coastal Plain / Piedmont Acidic Seepage Swamp (plot PETE. 8) at Petersburg National Battlefield. May 2006. NAD 1983 / UTM easting, 266615, northing 4114564.

COMMON NAME (PARK-SPECIFIC): BEAVER WETLAND COMPLEX

SYNONYMS

NVC English Name: Smooth Alder Swamp Shrubland
NVC Scientific Name: *Alnus serrulata* Swamp Shrubland
NVC Identifier: C EGL005082

LOCAL INFORMATION

Environmental Description: Beaver Wetland Complex includes disturbed vegetation associated with beaver activities along stream channels and usually has open standing water due to hydrologic alterations. Areas without open water have saturated soil conditions.

Vegetation Description: Beaver Wetland Complex includes a physiognomic complex of saturated deciduous forest, saturated shrubland, saturated herbaceous vegetation and open water. Forested areas are dominated by *Acer rubrum* (red maple). The shrubland areas are typically dominated by *Alnus serrulata* (hazel alder), although other species, such as *Salix nigra* (black willow) and *Cephalanthus occidentalis* (common buttonbush), may occur. Typical herbaceous species include *Boehmeria cylindrica* (smallspike false nettle), *Carex* spp. (sedges), *Dulichium arundinaceum* (threeway sedge), *Impatiens capensis* (jewelweed), *Juncus effusus* (common rush), *Leersia virginica* (whitegrass), *Murdannia keisak* (wartremoving herb), *Nuphar lutea* ssp. *advena* (yellow pond-lily), *Polygonum sagittatum* (arrowleaf tearthumb), and *Sparganium americanum* (American bur-reed).

Most Abundant Species:

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Alnus serrulata</i> (hazel alder)
Floating aquatic	Aquatic herb (floating & submergent)	<i>Nuphar lutea</i> ssp. <i>advena</i> (yellow pond-lily)

Characteristic Species: *Alnus serrulata* (hazel alder), *Nuphar lutea* ssp. *advena* (yellow pond-lily), *Sparganium americanum* (American bur-reed).

Other Noteworthy Species:

<u>Species</u>	<u>GRank</u>	<u>Type</u>	<u>Note</u>
<i>Murdannia keisak</i> (wartremoving herb)	-	plant	invasive nonnative

Subnational Distribution with Crosswalk Data:

<u>State</u>	<u>SRank</u>	<u>Rel</u>	<u>Conf</u>	<u>SName</u>	<u>Reference</u>
VA	SNR	.	.	[not crosswalked]	.

Local Range: Beaver Wetland Complex is mapped as one polygon at Five Forks Battlefield. It covers 7 hectares (17 acres).

Classification Comments: Beaver Wetland Complex is associated with beaver activities along a stream channel and usually has open water. It has distinct species composition that differentiates it from other wetland vegetation in Petersburg National Battlefield.

Other Comments: Information not available.

Local Description Authors: K. D. Patterson.

Plots: None.

Petersburg National Battlefield Inventory Notes: Information not available.

GLOBAL INFORMATION

NVC CLASSIFICATION

Physiognomic Class	Shrubland (III)
Physiognomic Subclass	Deciduous shrubland (III.B.)
Physiognomic Group	Cold-deciduous shrubland (III.B.2.)
Physiognomic Subgroup	Natural/Semi-natural cold-deciduous shrubland (III.B.2.N.)
Formation	Seasonally flooded cold-deciduous shrubland (III.B.2.N.e.)
Alliance	<i>Alnus serrulata</i> Seasonally Flooded Shrubland Alliance (A.994)
Alliance (English name)	Smooth Alder Seasonally Flooded Shrubland Alliance
Association	<i>Alnus serrulata</i> Swamp Shrubland
Association (English name)	Smooth Alder Swamp Shrubland
Ecological System(s):	Central Appalachian River Floodplain (CES202.608). Laurentian-Acadian Wet Meadow-Shrub Swamp (CES201.582).

GLOBAL DESCRIPTION

Concept Summary: This alder swamp is found widely throughout the northeastern United States south of near-boreal regions. These shrublands are found on muck overlying mineral soils (peat deposits are not typical) of upland marsh borders, at the edges of red maple swamps, or in acidic colluvium at bases of slopes. The pH of these systems is broadly circumneutral to somewhat calcareous. The vegetation is dominated by tall shrubs, characterized and usually dominated by *Alnus serrulata* (hazel alder), sometimes in a mixture with (or rarely replaced by) *Alnus incana* (gray alder). Associate shrubs vary somewhat with geography and include *Cornus sericea* (redosier dogwood), *Rosa palustris* (swamp rose), *Physocarpus opulifolius* (common ninebark), *Viburnum recognitum* (southern arrowwood), and *Salix* spp. (willows) Saplings of *Acer rubrum* (red maple) are typical. Short shrubs include *Spiraea alba* var. *latifolia* (white meadowsweet) and *Lindera benzoin* (northern spicebush). Less frequent shrubs include *Cephalanthus occidentalis* (common buttonbush), *Decodon verticillatus* (swamp loosestrife), *Ilex verticillata* (common winterberry), *Rhododendron viscosum* (swamp azalea), and *Sambucus canadensis* (= *Sambucus nigra* ssp. *canadensis*, common elderberry). Herbaceous associates include *Calamagrostis canadensis* (bluejoint), *Osmunda regalis* (royal fern), *Glyceria striata* (fowl mannagrass), *Thelypteris palustris* (eastern marsh fern), *Galium* spp. (bedstraws), *Typha latifolia* (broadleaf cattail), *Polygonum hydropiper* (marshpepper knotweed), *Bidens cernua* (nodding beggartick), *Galium tinctorium* (stiff marsh bedstraw), *Cicuta maculata* (spotted water hemlock), *Peltandra virginica* (green arrow arum), and *Carex stricta* (upright sedge).

Environmental Description: These shrublands are found on muck overlying mineral soils (peat deposits are not typical) of upland marsh borders, small upland depressions, at the edges of red maple swamps or other ponded drainages, or in colluvium at bases of slopes. The pH of these systems is broadly circumneutral to somewhat calcareous (Fike 1999).

Vegetation Description: The vegetation is dominated by tall shrubs and characterized by *Alnus serrulata* (hazel alder), *Alnus incana* (gray alder), *Physocarpus opulifolius* (common ninebark), *Viburnum recognitum* (southern arrowwood), *Cornus amomum* (silky dogwood), and *Salix* spp. (willows) Saplings of *Acer rubrum* (red maple) are typical. Short shrubs include *Spiraea alba* var. *latifolia* (white meadowsweet) and *Lindera benzoin* (northern spicebush). Other shrubs present include *Cephalanthus occidentalis* (common buttonbush), *Decodon verticillatus* (swamp loosestrife), *Ilex verticillata* (common winterberry), *Rhododendron viscosum* (swamp azalea), and *Sambucus canadensis* (= *Sambucus nigra* ssp. *canadensis*, common elderberry) (Anderson 1996, Fike 1999). Herbaceous associates include *Calamagrostis canadensis* (bluejoint), *Osmunda regalis* (royal fern), *Glyceria striata* (fowl mannagrass), *Thelypteris palustris* (eastern

marsh fern), *Galium* spp. (bedstraws), *Typha latifolia* (broadleaf cattail), *Polygonum hydropiper* (marshpepper knotweed), *Bidens cernua* (nodding beggartick), *Galium tinctorium* (stiff marsh bedstraw), *Cicuta maculata* (spotted water hemlock), *Peltandra virginica* (green arrow arum), and *Carex stricta* (upright sedge).

Most Abundant Species:

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Alnus incana</i> (gray alder)
Tall shrub/sapling	Broad-leaved deciduous shrub	<i>Alnus serrulata</i> (hazel alder), <i>Physocarpus opulifolius</i> (common ninebark), <i>Viburnum recognitum</i> (southern arrowwood)
Herb (field)	Forb	<i>Peltandra virginica</i> (green arrow arum)
Herb (field)	Graminoid	<i>Calamagrostis Canadensis</i> (bluejoint)
Herb (field)	Fern or fern ally	<i>Osmunda regalis</i> (royal fern)

Characteristic Species: *Alnus serrulata* (hazel alder), *Cornus amomum* (silky dogwood), *Physocarpus opulifolius* (common ninebark), *Viburnum recognitum* (southern arrowwood).

Other Noteworthy Species: Information not available.

USFWS Wetland System: Palustrine.

DISTRIBUTION

Range: This alder swamp is found widely throughout the northeastern United States, ranging from central New England south to New Jersey, and west to Ohio and Pennsylvania.

States/Provinces: CT, DE?, MA, MD?, ME, NH, NJ, NY, OH, PA, QC?, RI, VA, VT.

Federal Lands: NPS (Appomattox Court House, Delaware Water Gap, Fredericksburg-Spotsylvania, Minute Man, Petersburg, Richmond).

CONSERVATION STATUS

Rank: G4G5 (22-Mar-1999).

Reasons: Information not available.

CLASSIFICATION INFORMATION

Status: Standard.

Confidence: 3 - Weak.

Comments: This type overlaps with *Alnus incana* Swamp Shrubland (CEGL002381) where the ranges abut in Ohio, Pennsylvania, southern New England, and southern New York. Where both alder species are present, this type is distinguished from the *Alnus incana* (gray alder) nominal type by the presence of species with a somewhat more Central Appalachian / Alleghenian affinity such as *Physocarpus opulifolius* (common ninebark), *Rhododendron viscosum* (swamp azalea), *Peltandra virginica* (green arrow arum), compared to CEGL002381 which is characterized by somewhat more northern species such as *Nemopanthus mucronatus* (catberry) and *Myrica gale* (sweetgale). Where they overlap, the relative dominance of the two alder species should be expected to vary. If *Alnus serrulata* (hazel alder) is present in more than token amounts, consider this type as opposed to CEGL002381.

Similar Associations:

- *Alnus incana* Swamp Shrubland (CEGL002381).
- *Alnus serrulata* Southeastern Seasonally Flooded Shrubland (CEGL008474).

Related Concepts:

- Smooth alder shrub thicket (CAP pers. comm. 1998) ?

SOURCES

Description Authors: L. A. Sneddon, mod. D. Faber-Langendoen and S. C. Gawler.

References: Anderson 1996, CAP pers. comm. 1998, Eastern Ecology Working Group n.d., Fike 1999, Swain and Kearsley 2001



Figure I15. Beaver Wetland Complex at Richmond National Battlefield Park. June 2004.

COMMON NAME (PARK-SPECIFIC): CULTURAL MEADOW

SYNONYMS

NVC English Name: Orchard Grass - Timothy - Fescue species - Goldenrod species
Herbaceous Vegetation
NVC Scientific Name: *Dactylis glomerata* - *Phleum pratense* - *Festuca* spp. - *Solidago*
spp. Herbaceous Vegetation
NVC Identifier: C EGL006107

LOCAL INFORMATION

Environmental Description: Cultural Meadow includes herbaceous-dominated vegetation that is maintained as open fields or agricultural leases. Historic battlefields in Petersburg National Battlefield are maintained to keep an open landscape similar to conditions during the mid-19th century.

Vegetation Description: These areas are vegetated by a mix of native and European grasses and forbs or by planted agricultural crops. Fields tend to be dense stands of sod-forming grasses such as *Lolium pratense* (meadow ryegrass), *Andropogon virginicus* (broomsedge bluestem), *Dactylis glomerata* (orchardgrass), and *Tridens flavus* (purpletop tridens). In areas that are mowed more closely typical species may include *Cynodon dactylon* (Bermudagrass), *Digitaria sanguinalis* (hairy crabgrass), and *Echinochloa crus-galli* (barnyardgrass).

Areas mapped as Cultural Meadow may have below minimum mapping unit (<0.5 ha) inclusions of tree-dominated patches, windrows, shrub-dominated ditches or small wetland inclusions. These areas may also have cultural features such as walkways and monuments.

Most Abundant Species: Information not available.

Characteristic Species: Information not available.

Other Noteworthy Species: Information not available.

Subnational Distribution with Crosswalk Data:

<u>State</u>	<u>SRank</u>	<u>Rel</u>	<u>Conf</u>	<u>SName</u>	<u>Reference</u>
VA	SNA	.	.	[not crosswalked]	.

Local Range: Cultural Meadow is mapped at the Eastern Front (Main Unit), Five Forks Battlefield, and in the Western Front at Fort Wadsworth and Fort Gregg. It is mapped as 23 polygons covering 96 hectares (237 acres).

Classification Comments: Cultural Meadow is a herbaceous-dominated mapping class. It is distinguished from other map classes by its physiognomy and by lacking associated buildings, earthworks, and by not occurring as a linear strip along roadways or utility corridors. Lawns around buildings are mapped with the building and included in the map class Other Urban or Built-up Land. Mowed roadsides occurring as linear strips along roadways are included in the map class Transportation, Communications, and Utilities. Earthworks that are vegetated with herbaceous species are included in the map class Open Earthworks.

Other Comments: Information not available.

Local Description Authors: K. D. Patterson.

Plots: None.

Petersburg National Battlefield Inventory Notes: Information not available.

GLOBAL INFORMATION

NVC CLASSIFICATION

Physiognomic Class	Herbaceous Vegetation (V)
Physiognomic Subclass	Perennial graminoid vegetation (V.A.)
Physiognomic Group	Temperate or subpolar grassland (V.A.5.)
Physiognomic Subgroup	Natural/Semi-natural temperate or subpolar grassland (V.A.5.N.)
Formation	Medium-tall sod temperate or subpolar grassland (V.A.5.N.c.)
Alliance	<i>Dactylis glomerata</i> - <i>Rumex acetosella</i> Herbaceous Alliance (A.1190)
Alliance (English name)	Orchard Grass - Common Sheep Sorrel Herbaceous Alliance
Association	<i>Dactylis glomerata</i> - <i>Phleum pratense</i> - <i>Festuca</i> spp. - <i>Solidago</i> spp. Herbaceous Vegetation
Association (English name)	Orchard Grass - Timothy - Fescue species - Goldenrod species Herbaceous Vegetation
Ecological System(s):	Information not available.

GLOBAL DESCRIPTION

Concept Summary: This broadly defined vegetation type includes pastures and post-agricultural fields and is largely composed of nonnative cool-season grasses and herbs (generally of European origin) in the early stages of succession. The fields are typically mowed at least annually. Physiognomically, these grasslands are generally comprised of mid-height (1–3 feet tall) grasses and forbs, with occasional scattered shrubs. Species composition varies from site to site, depending on land-use history and perhaps soil type, but in general this vegetation is quite wide-ranging in northeastern and midwestern states and at higher elevations (610–1220 m [2000–4000 feet]) in the southeastern states. Dominant grasses vary from site to site but generally feature the nominal species. Other graminoid associates may include *Agrostis stolonifera* (creeping bentgrass), *Agrostis hyemalis* (winter bentgrass), *Elymus repens* (quackgrass), *Bromus inermis* (smooth brome), *Bromus tectorum* (cheatgrass), *Lolium perenne* (perennial ryegrass), *Poa pratensis* (Kentucky bluegrass), *Poa compressa* (Canada bluegrass), *Schizachyrium scoparium* (little bluestem) (not in abundance), and *Anthoxanthum odoratum* (sweet vernalgrass). Forbs scattered among the grasses are varied but include *Hieracium* spp. (hawkweeds), *Oxalis stricta* (common yellow oxalis), *Achillea millefolium* (common yarrow), *Asclepias syriaca* (common milkweed), *Solidago rugosa* (wrinkleleaf goldenrod), *Solidago nemoralis* (gray goldenrod), *Solidago juncea* (early goldenrod), *Solidago canadensis* (Canada goldenrod), *Solidago altissima* (tall goldenrod), *Euthamia graminifolia* (flat-top goldentop), *Cerastium arvense* (field chickweed), *Oenothera biennis* (common evening-primrose), *Potentilla simplex* (common cinquefoil), *Symphyotrichum lateriflorum* (calico aster), *Symphyotrichum novae-angliae* (New England aster), *Symphyotrichum lanceolatum* (white panicle aster), *Daucus carota* (Queen Anne's lace), *Ambrosia artemisiifolia* (annual ragweed), *Vicia cracca* (bird vetch), *Trifolium* spp. (clovers), and many others.

Environmental Description: This association occurs on pastures and land that has been tilled. Generally the fields are mowed at least annually.

Vegetation Description: In addition to *Dactylis glomerata* (orchardgrass) and *Phleum pratense* (timothy), these grassy fields are characterized by graminoids including *Agrostis stolonifera* (creeping bentgrass), *Agrostis hyemalis* (winter bentgrass), *Elymus repens* (quackgrass), *Bromus inermis* (smooth brome), *Bromus tectorum* (cheatgrass), *Lolium perenne* (perennial ryegrass), *Poa pratensis* (Kentucky bluegrass), *Poa compressa* (Canada bluegrass), *Schizachyrium scoparium* (little bluestem) (not in abundance), and *Anthoxanthum odoratum* (sweet vernalgrass). Forbs scattered among the grasses are varied but include *Hieracium* spp. (hawkweeds), *Oxalis*

stricta (common yellow oxalis), *Achillea millefolium* (common yarrow), *Asclepias syriaca* (common milkweed), *Solidago rugosa* (wrinkleleaf goldenrod), *Solidago nemoralis* (gray goldenrod), *Solidago juncea* (early goldenrod), *Solidago canadensis* (Canada goldenrod), *Solidago altissima* (tall goldenrod), *Euthamia graminifolia* (flat-top goldentop), *Cerastium arvense* (field chickweed), *Oenothera biennis* (common evening-primrose), *Potentilla simplex* (common cinquefoil), *Symphotrichum lateriflorum* (calico aster), *Symphotrichum novae-angliae* (New England aster), *Symphotrichum lanceolatum* (white panicle aster), *Daucus carota* (Queen Anne's lace), *Ambrosia artemisiifolia* (annual ragweed), *Vicia cracca* (bird vetch), *Trifolium* spp. (clovers), and many others.

Most Abundant Species:

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Herb (field)	Forb	<i>Rumex acetosella</i> (common sheep sorrel)
Herb (field)	Graminoid	<i>Dactylis glomerata</i> (orchardgrass), <i>Festuca rubra</i> (red fescue), <i>Phleum pratense</i> (timothy)

Characteristic Species: *Achillea millefolium* (common yarrow), *Anthoxanthum odoratum* (sweet vernalgrass), *Dactylis glomerata* (orchardgrass), *Euthamia graminifolia* (flat-top goldentop), *Phleum pratense* (timothy), *Rumex acetosella* (common sheep sorrel), *Solidago altissima* (tall goldenrod), *Solidago canadensis* (Canada goldenrod), *Solidago rugosa* (wrinkleleaf goldenrod).

Other Noteworthy Species: Information not available.

USFWS Wetland System: Not applicable.

DISTRIBUTION

Range: This vegetation is quite wide-ranging in northeastern and midwestern states and possibly occurs at higher elevations in the southeastern states.

States/Provinces: CT, DE, KY, MA, MD, ME, NB?, NH, NJ, NS?, NY, PA, QC?, RI, TN, VA, VT, WV.

Federal Lands: NPS (Allegheny Portage Railroad, Appomattox Court House, Booker T. Washington, Boston Harbor Islands, Cape Cod, Colonial, Delaware Water Gap, Fire Island, Fort Necessity, Fredericksburg-Spotsylvania, Friendship Hill, Gateway, George Washington Birthplace, Gettysburg, Johnstown Flood, Marsh-Billings-Rockefeller, Minute Man, Morristown, Petersburg, Richmond, Saint-Gaudens, Saratoga, Upper Delaware, Valley Forge, Weir Farm); USFWS (Aroostook, Assabet River, Carlton Pond, Erie, Great Meadows, Moosehorn, Nulhegan Basin, Oxbow, Parker River).

CONSERVATION STATUS

Rank: GNA (modified/managed) (8-Dec-2005).

Reasons: This vegetation type includes pasture and post-agricultural fields and is largely composed of nonnative grasses and herbs (generally of European origin).

CLASSIFICATION INFORMATION

Status: Standard.

Confidence: 3 - Weak.

Comments: *Schizachyrium scoparium* - (*Andropogon virginicus*) - *Solidago* spp. Herbaceous Vegetation (CEGL006333) is similar to this type but is dominated by warm-season grasses.

Similar Associations:

- *Lolium (arundinaceum, pratense)* Herbaceous Vegetation (CEGL004048)
- *Phleum pratense - Bromus pubescens - Helinium autumnale* Herbaceous Vegetation (CEGL004018)
- *Schizachyrium scoparium - (Andropogon virginicus) - Solidago* spp. Herbaceous Vegetation (CEGL006333)-- has a greater component of native species and occurs on drier soils.

Related Concepts: Information not available.

SOURCES

Description Authors: S. C. Gawler.

References: Clark 1986, Dowhan and Rozsa 1989, Eastern Ecology Working Group n.d., Edinger et al. 2002, Ehrenfeld 1977, Elliman 2003, Keever 1979, NRCS 2004, Newbold et al. 1988, Perles et al. 2006a, Perles et al. 2006b, Perles et al. 2006c, Perles et al. 2007, Sneddon et al. 1995, TDNH unpubl. data.



Figure I16. Cultural Meadow at Richmond National Battlefield Park. May 2007.

COMMON NAME (PARK-SPECIFIC): DISTURBED CALCAREOUS FOREST

SYNONYMS

NVC English Name: Not applicable
NVC Scientific Name: Not applicable
NVC Identifier: Nonstandard

LOCAL INFORMATION

Environmental Description: Disturbed Calcareous Forest occurs on steep slopes over well-drained soils above the Appomattox River. Bluffs along the lower Appomattox and James Rivers frequently cut into Tertiary shell material or limesands that contribute abundant calcium to the soils.

Vegetation Description: Disturbed Calcareous Forest is a forested bluff with a very open canopy of large *Celtis occidentalis* (common hackberry), *Liriodendron tulipifera* (tuliptree), *Juglans nigra* (black walnut), and *Ulmus americana* (American elm). Other canopy trees include *Platanus occidentalis* (American sycamore) and *Populus deltoides* (eastern cottonwood) and the exotic trees *Morus alba* (white mulberry), *Broussonetia papyrifera* (paper mulberry), and *Ailanthus altissima* (tree of heaven), the latter two sometimes dominating the canopy. The understory and herb layer is a dense tangle of shrubs and vines dominated by the exotic species *Lonicera japonica* (Japanese honeysuckle), *Ligustrum sinense* (Chinese privet), *Morus alba* (white mulberry), *Vinca major* (bigleaf periwinkle), and *Hedera helix* (English ivy). Other typical understory species include *Morus alba* (white mulberry), *Robinia pseudoacacia* (black locust), *Vitis vulpina* (frost grape), and species from the canopy. Typical herbaceous species include the exotic *Vicia grandiflora* (large yellow vetch) and *Phytolacca americana* (American pokeweed). *Broussonetia papyrifera* (paper mulberry) or *Ailanthus altissima* (tree of heaven) may be locally dominant in this forest.

Most Abundant Species:

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Celtis occidentalis</i> (common hackberry)
Tree subcanopy	Broad-leaved deciduous tree	<i>Broussonetia papyrifera</i> (paper mulberry)
Tall shrub/sapling	Vine/Liana	<i>Lonicera japonica</i> (Japanese honeysuckle), <i>Vitis vulpina</i> (frost grape)

Characteristic Species: *Celtis occidentalis* (common hackberry), *Juglans nigra* (black walnut).

Other Noteworthy Species:

<u>Species</u>	<u>GRank</u>	<u>Type</u>	<u>Note</u>
<i>Ailanthus altissima</i> (tree of heaven)	-	plant	invasive nonnative
<i>Broussonetia papyrifera</i> (paper mulberry)	-	plant	nonnative
<i>Hedera helix</i> (English ivy)	-	plant	invasive nonnative
<i>Ligustrum sinense</i> (Chinese privet)	-	plant	invasive nonnative
<i>Lonicera japonica</i> (Japanese honeysuckle)	-	plant	invasive nonnative
<i>Morus alba</i> (white mulberry)	-	plant	invasive nonnative
<i>Vicia grandiflora</i> (large yellow vetch)	-	plant	invasive nonnative
<i>Vinca major</i> (bigleaf periwinkle)	-	plant	invasive nonnative

Subnational Distribution with Crosswalk Data:

<u>State</u>	<u>SRank</u>	<u>Rel</u>	<u>Conf</u>	<u>SName</u>	<u>Reference</u>
VA	NA	.	.	[not crosswalked, not ranked]	.

Local Range: Disturbed Calcareous Forest is mapped as a single polygon at City Point (Grant's Headquarters) 1.8 hectares (4.5 acres) in size.

Classification Comments: Disturbed Calcareous Forest is distinguished from other vegetation in Petersburg National Battlefield by its occurrence on steep river bluffs and by its unique species composition. Some polygons of Successional Mixed Shrublands may have similar composition but are distinguished by their shorter shrubland structure, lacking the large canopy trees found in Disturbed Calcareous Forest.

Other Comments: Information not available.

Local Description Authors: K. D. Patterson.

Plots: None.

Petersburg National Battlefield Inventory Notes: Information not available.

GLOBAL INFORMATION

Disturbed Calcareous Forest is a park-specific, nonstandard type and has no global information.

COMMON NAME (PARK-SPECIFIC): FORESTED EARTHWORKS

SYNONYMS

NVC English Name: Not applicable
NVC Scientific Name: Not applicable
NVC Identifier: Nonstandard

LOCAL INFORMATION

Environmental Description: Information not available.

Vegetation Description: Information not available.

Most Abundant Species: Information not available.

Characteristic Species: Information not available.

Other Noteworthy Species: Information not available.

Subnational Distribution with Crosswalk Data:

<u>State</u>	<u>SRank</u>	<u>Rel</u>	<u>Conf</u>	<u>SName</u>	<u>Reference</u>
VA	NA	.	.	[not crosswalked, not ranked]	.

Local Range: Forested Earthworks are mapped in the Eastern Front (Main Unit) and in the Western Front at Long Plank and Fort Wheaton. They cover 11.2 hectares (27.7 acres) on the vegetation map.

Classification Comments: Forested Earthworks is a map class used to indicate areas where Civil War era earthworks have become forested. Species growing on the earthworks vary from site to site. The dominant leaf phenology of the vegetation is indicated in the attribute table of the map (i.e., deciduous forest or mixed evergreen-deciduous forest).

Other Comments: In some areas, earthworks that were forested when the base map photography was acquired (Feb. 2002) have been cleared. The vegetation map reflects acreage of forested earthworks in February 2002.

Local Description Authors: K. D. Patterson.

Plots: None.

Petersburg National Battlefield Inventory Notes: Information not available.

GLOBAL INFORMATION

Forested Earthworks is a park-specific, nonstandard type and has no global information.

COMMON NAME (PARK-SPECIFIC): OPEN EARTHWORKS

SYNONYMS

NVC English Name: Not applicable
NVC Scientific Name: Not applicable
NVC Identifier: Nonstandard

LOCAL INFORMATION

Environmental Description: Information not available.

Vegetation Description: Information not available.

Most Abundant Species: Information not available.

Characteristic Species: Information not available.

Other Noteworthy Species: Information not available.

Subnational Distribution with Crosswalk Data:

<u>State</u>	<u>SRank</u>	<u>Rel</u>	<u>Conf</u>	<u>SName</u>	<u>Reference</u>
VA	NA	.	.	[not crosswalked, not ranked]	.

Local Range: Open Earthworks are mapped in the Eastern Front (Main Unit) and in the Western Front at Long Plank, Fort Wadsworth, and Fort Gregg. They cover 6.2 hectares (15.4 acres) in these areas.

Classification Comments: Open Earthworks is a map class used to indicate Civil War era earthworks that are maintained in a non-forested condition. Species growing on the earthworks vary from site to site and some have been planted in Fescue grass.

Other Comments: In the Western Front at Long Plank, earthworks that were forested when the base map photography was acquired (Feb. 2002) are no longer forested. The vegetation map reflects acreage of open earthworks as of February 2002.

Local Description Authors: K. D. Patterson.

Plots: None.

Petersburg National Battlefield Inventory Notes: Information not available.

GLOBAL INFORMATION

Open Earthworks is a park-specific, nonstandard type and has no global information.

COMMON NAME (PARK-SPECIFIC): SEMIPERMANENT IMPOUNDMENT

SYNONYMS

NVC English Name: Not applicable
NVC Scientific Name: Not applicable
NVC Identifier: Nonstandard

LOCAL INFORMATION

Environmental Description: Information not available.

Vegetation Description: Information not available.

Most Abundant Species: Information not available.

Characteristic Species: Information not available.

Other Noteworthy Species: Information not available.

Subnational Distribution with Crosswalk Data:

<u>State</u>	<u>SRank</u>	<u>Rel</u>	<u>Conf</u>	<u>SName</u>	<u>Reference</u>
VA	NA	.	.	[not crosswalked, not ranked]	.

Local Range: Semipermanent Impoundments are mapped at Five Forks Battlefield and at the Eastern Front (Main Unit).

Classification Comments: Semipermanent Impoundments are wetlands associated with persistent man-made impoundments and ditching. Semipermanent Impoundments at Petersburg National Battlefield include two anthropogenic ponds created by construction of earthen dams. These ponds may have floating aquatic vegetation or rooted aquatic plants on the pond margins.

Other Comments: Information not available.

Local Description Authors: K. D. Patterson.

Plots: None.

Petersburg National Battlefield Inventory Notes: Information not available.

GLOBAL INFORMATION

Semipermanent Impoundment is a park-specific, nonstandard type and has no global information.

COMMON NAME (PARK-SPECIFIC): **SUCCESSIONAL MIXED SCRUB**

SYNONYMS

NVC English Name: **Not applicable**
NVC Scientific Name: **Not applicable**
NVC Identifier: **Nonstandard**

LOCAL INFORMATION

Environmental Description: Successional Mixed Scrub includes low-statured, woody vegetation composed mainly of exotic species and occurring along edges of roadways and Cultural Meadow.

Vegetation Description: Dominant species may vary from stand to stand, but composition usually includes the exotic species *Ailanthus altissima* (tree of heaven). Other common to dominant shrubs can include the exotic species *Morus alba* (white mulberry) and *Broussonetia papyrifera* (paper mulberry), along with the native species *Juniperus virginiana* var. *virginiana* (eastern redcedar), *Ulmus alata* (winged elm), *Rhus copallinum* (flameleaf sumac), and *Celtis* sp. (a hackberry). Vines can have high cover in the low-shrub and herb layer, particularly *Toxicodendron radicans* (eastern poison ivy), *Lonicera japonica* (Japanese honeysuckle), *Vitis vulpina* (frost grape), and *Rubus* sp. (a blackberry). Typical herbs in these successional shrublands include *Phytolacca americana* (American pokeweed) and *Vicia grandiflora* (large yellow vetch). Dominant species may vary within a polygon and from stand to stand.

Most Abundant Species: Information not available.

Characteristic Species: Information not available.

Other Noteworthy Species: Information not available.

Subnational Distribution with Crosswalk Data:

<u>State</u>	<u>SRank</u>	<u>Rel</u>	<u>Conf</u>	<u>SName</u>	<u>Reference</u>
VA	NA	.	.	[not crosswalked, not ranked]	.

Local Range: Successional Mixed Scrub is mapped at Grant's Headquarters (City Point) and in the Western Front at Fort Gregg. It occurs as three polygons, covering a total of 2.7 hectare (6.6 acres).

Classification Comments: This vegetation is distinguished by its low shrubland stature, by being composed of mainly exotic species, and by its occurrence in disturbed areas.

Other Comments: Information not available.

Local Description Authors: K. D. Patterson.

Plots: None.

Petersburg National Battlefield Inventory Notes: Information not available.

GLOBAL INFORMATION

Successional Mixed Scrub is a park-specific, nonstandard type and has no global information.



Figure I17. Successional Mixed Scrub at Petersburg National Battlefield. May 2006. NAD 1983 / UTM easting 298433, northing 4132432.



Figure I18. Successional Mixed Scrub at Petersburg National Battlefield. May 2006. NAD 1983 / UTM easting 298231, northing 4132518.

COMMON NAME (PARK-SPECIFIC): BARREN LAND

SYNONYMS

NVC English Name: Not applicable

NVC Scientific Name: Not applicable

NVC Identifier: Not applicable

LOCAL INFORMATION

Local Range: Barren Land is mapped as a single polygon in Five Forks Battlefield.

Classification Comments: This map class includes areas that are dominated by thin soil, sand, or rocks and have less than one-third vegetation cover. This map class is equal to the Anderson et al. (1976) Level II unit 7, Barren Land.

Other Comments: The area mapped as barren land is below minimum mapping unit, but was mapped because of its distinct photographic signature.

Local Description Authors: K. D. Patterson.

Plots: None.

Inventory Notes: Information not available.

Citation: Anderson et al. 1976.

COMMON NAME (PARK-SPECIFIC): OTHER URBAN OR BUILT-UP LAND

SYNONYMS

NVC English Name: Not applicable

NVC Scientific Name: Not applicable

NVC Identifier: Not applicable

LOCAL INFORMATION

Local Range: Other Urban or Built-up Land is mapped at the Eastern Front (Main unit), Five Forks Battlefield, Grant's Headquarters (City Point), and in the Western Front at Poplar Grove and Long Plank.

Classification Comments: This map class includes areas with buildings associated with park maintenance and historic interpretation or residences. This map class includes all buildings, walkways, minor roads, and their associated lawns and vegetation. This map class is equal to the Anderson et al. (1976) Level II unit 17, Other Urban or Built-up Land.

Other Comments: Lawns and other mowed areas greater than 0.5 hectare are mapped as Cultural Meadow. Mowed areas along roads are included in the map class Transportation, Communications, and Utilities.

Local Description Authors: K. D. Patterson.

Plots: None.

Inventory Notes: Information not available.

Citation: Anderson et al. 1976.

COMMON NAME (PARK-SPECIFIC): **TRANSPORTATION, COMMUNICATIONS, AND UTILITIES**

SYNONYMS

NVC English Name: **Not applicable**

NVC Scientific Name: **Not applicable**

NVC Identifier: **Not applicable**

LOCAL INFORMATION

Local Range: Areas mapped as Transportation, Communications, and Utilities occur in the Eastern Front (Main Unit), Western Front, and Five Forks Battlefield units of Petersburg National Battlefield.

Classification Comments: This map class includes major paved roads and parking areas and utility line corridors. This map class is equal to the Anderson (1976) Level II unit 14, Transportation, Communications, and Utilities

Other Comments: Mowed roadsides are included in this map class. The comment field in the map attribute table indicates if a polygon represents transportation, utilities, or a mowed area.

Local Description Authors: K. D. Patterson.

Plots: None.

Inventory Notes: Information not available.

Citation: Anderson et al. 1976.

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Appendix J. Field definitions for local and global descriptions of vegetation associations and other vegetation-map classes.

Local descriptions describe vegetation associations and other vegetation-map classes as they occur at specific national parks. Data from field observation points and quantitative plots were used to write the local, park-specific descriptions. These descriptions were entered into NatureServe Central Databases and reports with local and global descriptions for each association were generated for each park. The following document lists the content of those reports with definitions of each field in the report.

COMMON NAME (PARK-SPECIFIC): A common or colloquial name for the Association or map class. These names follow the Natural Communities of Virginia (Fleming et al 2006) or, if no appropriate name exists in Fleming et al (2006), the Association common name from the U.S. National Vegetation Classification (USNVC) was used, or a park-specific common name was assigned. Names for map classes not representing natural or semi-natural vegetation follow the Anderson Level II land use and land cover classification scheme (Anderson et al. 1976).

SYNONYMS

USNVC English Name: The standard Association name from USNVC databases, but with a translation of the scientific names using standard NatureServe Central Ecology-accepted common names for the plant taxa used in the name (see below).

USNVC Scientific Name: The standard Association name from USNVC databases, based on Latin names of dominant and diagnostic plant species. The Association is the finest level of the USNVC. Species occurring in the same stratum are separated by a hyphen (-), and those occurring in different strata are separated by a slash (/). Species occurring in the uppermost strata are listed first, followed successively by those in lower strata. Within the same stratum, the order of species names generally reflects decreasing levels of dominance, constancy, or indicator value. In physiognomic types where there is a dominant herbaceous layer with a scattered woody layer, Association names can be based on species found in either the herbaceous layer or the woody layer, whichever is more diagnostic of the type. If both layers are used, then the uppermost layer is always listed first, regardless of which may be more diagnostic.

Species less consistently found in all occurrences of the Association are placed in parentheses (). In cases where a particular genus is dominant or diagnostic but individual species of the genus may vary among occurrences, only the specific epithets are placed in parentheses. Association names conclude with the Class Name in which they are classified.

In cases where diagnostic species are unknown or in question, a more general term may be used as a species placeholder (e.g., *Sphagnum* spp., Mixed Herbs, Mesic Graminoids). An environmental or geographic term, or one that is descriptive of the height of the vegetation (e.g., Dwarf Forest, Northern Shrubland), can also be used as a modifier when such a term is necessary to adequately characterize the Association. For reasons of standardization and brevity, however,

this is kept to a minimum. For Provisional Associations, [Provisional] is added at the end of the name (ex. *Salix wolfii* Shrubland [Provisional]).

Vascular plant species nomenclature for Association and Alliance names follows the nationally standardized list of Kartesz (1999), with very few exceptions. Nomenclature for nonvascular plants follows Anderson (1990) and Anderson et al. (1990) for mosses, Egan (1987, 1989, 1990, 1991) and Esslinger and Egan (1995) for lichens, and Stotler and Crandall-Stotler (1977) for liverworts/hornworts.

USNVC Identifier: A unique identifier code for the Association from USNVC databases. Associations have a code that begins with the string “CEGL” (Community Element Global) followed by a unique 6-digit number. Units that are not defined in the USNVC are listed as “nonstandard” in this field.

LOCAL INFORMATION

Environmental Description: A summary of available information on the environmental conditions associated with the Association and any other important aspects of the environment which affect this particular type within the park, including elevation ranges and, where relevant, information on large landscape context, geology, and soils.

Vegetation Description: A summary of available information on the vegetation, species composition (including dominant and diagnostic taxa, as well as problematic exotic species), structure (defining strata and their heights and percent cover), and variability of the vegetation of this Association as it occurs in the park.

Most Abundant Species: Component plant species that are dominant (i.e., most abundant in terms of percent cover) for the Association as it occurs in the park.

Stratum: For each component plant species, the stratum (or strata) in which it occurs in the Association within the park. Values for Stratum are:

Tree (canopy & subcanopy)	Short shrub/sapling
Tree canopy	Herb (field)
Tree subcanopy	Nonvascular
Shrub/sapling (tall & short)	Floating aquatic
Tall shrub/sapling	Submerged aquatic

Lifeform: The lifeform of each component plant species that is present within each designated stratum of the community as it occurs within the park. Lifeform definitions are from Table 3.1, page 37, of Whittaker, R. H. 1975. *Communities and ecosystems*. Second edition. Macmillan Publishing Co. New York. 387 pp. Values for Lifeform are:

Needle-leaved tree	Palm shrub
Broad-leaved deciduous tree	Dwarf-shrub
Broad-leaved evergreen tree	Semi-shrub
Thorn tree	Succulent shrub
Evergreen sclerophyllous tree	Ephiphyte

Succulent tree	Vine/Liana
Palm tree	Forb
Tree fern	Graminoid
Bamboo	Succulent forb
Needle-leaved shrub	Aquatic herb (floating & submergent)
Broad-leaved deciduous shrub	Moss
Broad-leaved evergreen shrub	Alga
Thorn shrub	Lichen
Evergreen sclerophyllous shrub	Fern or fern ally
Other/unknown	Other herbaceous
Other shrub	Liverwort/hornwort

Species: Global scientific name (and common name) for each floristic component species of the Association as it occurs within the park.

Characteristic Species: Component plant species that are characteristic for the Association as it occurs within the park.

Other Noteworthy Species: Other noteworthy species (i.e., species that are not necessarily diagnostic of the Association, but that are worth noting for some other reasons, such as those that are rare species or nonnative invasives) that are found within the Association in the park.

Subnational Distribution with Crosswalk Data

State: The two-letter postal code of the for U.S. state(s) in which the park occurs.

State Rank (SRank): The Heritage Conservation Subnational Rank that best characterizes the relative rarity or endangerment of the Association within the specified state. Values for State Rank are listed in Appendix D. An asterisk (*) indicates that the Subnational Rank is for the Natural Heritage Program (NHP) Element (nonstandard), not the USNVC Association (standard) (see below).

Relationship (Rel): The State Name (see below) is the name that the state NHP applies to their community Element. The Relationship to Standard is a value that indicates the relationship between the NHP (Nonstandard) Element and the related Standard Association (USNVC). Values for Relationship to Standard are:

- = – Equivalent: NHP community is equivalent to the standard Association
- B – Broader: the NHP community is more broadly classified than the standard Association
- F – Finer: the NHP community is more finely classified than the standard Association
- I – Intersecting: the NHP community is not clearly broader or finer than this standard Association; the standard and NHP communities are related in a way that is more complex than a simple broader/finer relationship
- ? – Undetermined: the relationship between the NHP community and this standard Association is unknown

Confidence (Conf): Values for Confidence are: C - Certain; S - Somewhat certain; N - Not certain (null) - Not assessed or unknown.

State Name (SName): If the USNVC Association has been crosswalked to a state classification type and it is equivalent to the USNVC type, the State Name is the name that the Natural Heritage Program applies to the same community. A value of [gname] indicates that the State Name is the same as the Global Name. A value of [not crosswalked] indicates that no state type representing the concept of the USNVC Association has been identified. If a state type has been identified that is NOT equivalent to the USNVC Association (Standard), then the subnational type is considered a Nonstandard community. In this case, the State Name is the name of the nonstandard community.

Reference: This is the primary reference for the Natural Heritage Program classification that contains the State Name and confirms the presence of the Association in the state.

Local Range: A description of the total range (including present and historic, if known) of the Association within the park.

Classification Comments: Comments about classification criteria used to define the Association or description of any remaining issues associated with its classification in the park.

Other Comments: Additional comments about the Association within the park.

Local Description Authors: Name(s) of the person(s) primarily responsible for authorship of the current description of this Association in the park.

Plots: List of plot codes for plots used in the identification and classification of the Association in the park.

Inventory Notes: Information regarding the sampling of the Association in the park.

GLOBAL INFORMATION

USNVC Classification

Physiognomic Class: The second level of the USNVC which is a vegetation structural classification adapted from UNESCO 1973 and Driscoll et al. 1984. This level is based on the structure of the vegetation. This is determined by the height and relative percentage of cover of the dominant life-forms: tree, shrub, dwarf-shrub, herbaceous, and nonvascular.

Physiognomic Subclass: The third level of the USNVC. This level is determined by the predominant leaf phenology of classes defined by a tree, shrub, or dwarf-shrub stratum, the persistence and growth form of herbaceous and nonvascular vegetation, and particle size of the substrate for sparse vegetation (e.g., consolidated rocks, gravel/cobble).

Physiognomic Group: The fourth level of the USNVC. The group generally represents a grouping of vegetation units based on leaf characters, such as broad-leaf, needle-leaf,

microphyllous, and xeromorphic. These units are identified and named with broadly defined macroclimatic types to provide a structural-geographic orientation, but the ecological climate terms do not define the groups per se.

Physiognomic Subgroup: The fifth level of the USNVC represents a distinction between natural vegetation, including natural, semi-natural and some modified vegetation, and cultural vegetation (planted/cultivated).

Formation: The sixth level of the USNVC; represents a grouping of community types that share a definite physiognomy or structure and broadly defined environmental factors, such as elevation and hydrologic regime.

Classification Code (parenthetical following each of the above levels): The U. S. National Vegetation Classification (USNVC) Standard Classification code for the respective level of the hierarchy. Classification codes for the different levels are comprised of the following:

Class: Roman numerals (I-VII)

Subclass: Class code plus an uppercase letter (A-Z)

Group: Subclass code plus an Arabic number

Subgroup: Group code plus either the uppercase letter N (Natural/Semi-natural) or the uppercase letter C (Planted/Cultivated)

Formation: Subgroup code plus a lowercase letter (a-z)

Alliance: Level of USNVC reflecting a physiognomically uniform group of plant Associations sharing one or more diagnostic species (dominant, differential, indicator, or character), which (generally) are found in the uppermost stratum of the vegetation. The names of dominant and diagnostic species are the foundation of the Alliance Name. At least one species from the dominant and/or uppermost stratum is included. In rare cases, where the combination of species in the upper and lower strata is strongly diagnostic, species from other strata are included in the name. Species occurring in the same stratum are separated by a hyphen (-), and those occurring in a different strata are separated by a slash (/). Species occurring in the uppermost stratum are listed first, followed successively by those in lower strata. In physiognomic types where there is a dominant herbaceous layer with a scattered woody layer, alliance names can be based on species found in the herbaceous layer and/or the woody layer, whichever is more diagnostic of the type.

Species less consistently found in all associations of the alliance may be placed in parentheses, and these parenthetical names are generally listed alphabetically. In cases where a particular genus is dominant or diagnostic but the presence of individual species of the genus may vary among associations, only the specific epithets are placed in parentheses.

Nomenclature for vascular plant species follows a nationally standardized list (Kartesz 1999), with very few exceptions. Nomenclature for nonvascular plants follows Anderson (1990), Anderson et al. (1990), Egan (1987, 1989, 1990), Esslinger and Egan (1995), and Stotler and Crandall-Stotler (1977).

Alliance Key (parenthetical following Alliance): A unique identifier from the USNVC central database for each Alliance that begins with the string "A." followed by a unique 3- or 4-digit number.

Alliance (English name): A repeat of the Alliance name with a translation of the scientific names using standard NatureServe Central Ecology-accepted common names for the plant taxa in the name.

Association: The Association name includes the scientific names of dominant and diagnostic species. Species occurring in the same stratum are separated by a hyphen (-), and those occurring in different strata are separated by a slash (/). Species occurring in the uppermost strata are listed first, followed successively by those in lower strata. Within the same stratum, the order of species names generally reflects decreasing levels of dominance, constancy, or diagnostic value. In physiognomic types where there is a dominant herbaceous layer with a scattered woody layer, Association names can be based on species found in either the herbaceous layer or the woody layer, whichever is more diagnostic of the type. If both layers are used, then the uppermost layer is always listed first, regardless of which may be more diagnostic.

Species less consistently found in all occurrences of the Association are placed in parentheses (). In cases where a particular genus is dominant or diagnostic but individual species of the genus may vary among occurrences, only the specific epithets are placed in parentheses. Association names conclude with the Class Name in which they are classified.

In cases where diagnostic species are unknown or in question, a more general term may be used as a species placeholder (e.g., *Sphagnum* spp., Mixed Herbs, Mesic Graminoids). An environmental or geographic term, or one that is descriptive of the height of the vegetation (e.g., Dwarf Forest, Northern Shrubland), can also be used as a modifier when such a term is necessary to adequately characterize the Association. For reasons of standardization and brevity, however, this is kept to a minimum. For Provisional Associations, [Provisional] is added at the end of the name (ex. *Salix wolfii* Shrubland [Provisional]).

Vascular plant species nomenclature for Association and Alliance names follows the nationally standardized list of Kartesz (1999), with very few exceptions. Nomenclature for nonvascular plants follows Anderson (1990) and Anderson et al. (1990) for mosses, Egan (1987, 1989, 1990, 1991) and Esslinger and Egan (1995) for lichens, and Stotler and Crandall-Stotler (1977) for liverworts/hornworts.

Association (English name): A repeat of the Association Name, but with a translation of the scientific names using standard Central Ecology-accepted common names for the plant taxa used in the name.

Ecological System(s): A list of the Ecological Systems of which the Association is a member (NatureServe 2003). Ecological Systems are groups of plant associations unified by similar ecological conditions and processes (e.g., fire, riverine flooding), underlying environmental features (e.g., shallow soils, serpentine geology), and/or environmental gradients (e.g., elevation, hydrology in coastal zones). They should form relatively robust, cohesive, and distinguishable units on the ground. In most landscapes, the Ecological System will manifest itself on the

ground as a spatial aggregation at an intermediate scale (e.g., between the USNVC Alliance and Formation scales).

GLOBAL DESCRIPTION

Concept Summary: A description of the range, structure, composition, environmental setting, and dynamics associated with the community. Information includes a general understanding of the type, often with some concept of its distribution; environmental setting in which the type occurs, and a summary of the important disturbance regimes, successional status, and temporal dynamics for this community rangewide; community structure/physiognomy; species by strata (dominant and diagnostic taxa); and key diagnostic characteristics that distinguish it from similar types.

Environmental Description: A summary of available information on the environmental conditions of the Association rangewide and any other important aspects of the environment which affect this particular type, including elevation ranges and, where relevant, information on large landscape context, geology, and soils.

Vegetation Description: A summary of available information on the leaf type and phenology, species composition (including dominant and diagnostic taxa, as well as problematic exotic species), structure (defining strata and their heights and percent cover), and variability of the vegetation of this Association rangewide, and any additional comments relating to the vegetation.

Most Abundant Species: Component plant species that are dominant (i.e., most abundant in terms of percent cover) for the Association as it occurs rangewide.

Stratum: For each component plant species, the stratum (or strata) in which it occurs in the Association rangewide. Values for Stratum are:

Tree (canopy & subcanopy)	Short shrub/sapling
Tree canopy	Herb (field)
Tree subcanopy	Nonvascular
Shrub/sapling (tall & short)	Floating aquatic
Tall shrub/sapling	Submerged aquatic

Lifeform: The lifeform of each component plant species that is present within each designated stratum of the community as it occurs rangewide. Lifeform definitions are from Table 3.1, page 37, of Whittaker, R. H. 1975. *Communities and ecosystems*. Second edition. Macmillan Publishing Co. New York. 387 pp. Values for Lifeform are:

Needle-leaved tree	Palm shrub
Broad-leaved deciduous tree	Dwarf-shrub
Broad-leaved evergreen tree	Semi-shrub
Thorn tree	Succulent shrub
Evergreen sclerophyllous tree	Ephiphyte
Succulent tree	Vine/Liana

Palm tree	Forb
Tree fern	Graminoid
Bamboo	Succulent forb
Needle-leaved shrub	Aquatic herb (floating & submergent)
Broad-leaved deciduous shrub	Moss
Broad-leaved evergreen shrub	Alga
Thorn shrub	Lichen
Evergreen sclerophyllous shrub	Fern or fern ally
Other/unknown	Other herbaceous
Other shrub	Liverwort/hornwort

Species: Global scientific name (and common name) for each floristic component species of the Association as it occurs rangewide.

Characteristic Species: Component plant species that are characteristic for the Association as it occurs rangewide.

Other Noteworthy Species: Other noteworthy species (i.e., species that are not necessarily diagnostic of the Association, but that are worth noting for some other reasons, such as those that are rare species or nonnative invasives) that are found within the Association rangewide.

USFWS Wetland System: Systems developed for the classification of wetlands by the U.S. Fish and Wildlife Service. System refers to a complex of wetlands and deepwater habitats that share the influence of similar hydrologic, geomorphic, chemical, or biological factors. As defined in Cowardin et al. (1979), the values are:

Marine - consists of open ocean overlying the continental shelf and its associated high-energy coastline.

Estuarine - consists of deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land.

Riverine - includes all wetlands and deepwater habitats contained with a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts in excess of 0.5%.

Lacustrine - includes wetlands and deepwater habitats with all of the following characteristics: (1) situated in a topographic depression or a dammed river channel; (2) lacking trees, shrubs, persistent emergents, emergent mosses, or lichens with greater than 30% areal coverage; and (3) total area exceeds 8 ha (20 ac).

Palustrine - includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5%.

DISTRIBUTION

Range: A description of the total range (present and historic, if known) of the Association worldwide, using names of nations, subnations or states, ecoregions, etc.

States/Provinces: The two-letter postal codes for U.S. states and Canadian provinces in which the Association occurs. Mexican two-letter state abbreviations are preceded by “MX”. When the occurrence of the Association in a state/province is uncertain, a ? is appended. The state code may be followed by the State Rank when known.

Federal Lands: List of federal lands where the Association occurs or is believed to occur. Names used are shortened versions of the official name of the Federal land unit with “National Park, National Forest,” etc., dropped from the name. A ? indicates that presence is uncertain.

Federal Agency Abbreviations are:

BIA = Bureau of Indian Affairs
BLM = Bureau of Land Management
COE = U.S. Army Corps of Engineers
DOD = Department of Defense
DOE = Department of Energy
NPS = National Park Service
PC = Parks Canada
TVA = Tennessee Valley Authority
USFS = U.S. Forest Service
USFWS = U.S. Fish and Wildlife Service

CONSERVATION STATUS

Rank: The Heritage Conservation Status Global Rank which best characterizes the relative rarity or endangerment of the Association worldwide and the date the Global Rank was last reviewed (regardless of whether the rank was changed); values for Global Rank are listed in Appendix D.

For non-natural types, a Global Rank of GNA = Rank not applicable is assigned. They are further identified as one from the following:

Cultural - indicates that the Association is cultivated. Planted/cultivated areas are defined as being dominated by vegetation that has been planted in its current location by humans and/or is treated with annual tillage, a modified conservation tillage, or other intensive management or manipulation. The majority of these areas are planted and/or maintained for the production of food, feed, fiber, or seed.

Ruderal - indicates that the Association is considered ruderal. Ruderal communities are vegetation resulting from succession following anthropogenic disturbance of an area. They are generally characterized by unnatural combinations of species (primarily native species, though they often contain slight to substantial numbers and amounts of species alien to the region as well). In many landscapes, ruderal communities occupy

large areas - sometimes more than any other category of communities - and can provide important biodiversity functions.

Modified/Managed - indicates that the Association is modified or managed.

Modified/managed communities are vegetation resulting from the 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, time, or restoration of ecological processes. It is not yet clear how to deal with these communities in the USNVC.

Invasive - indicates that the Association is weedy and invasive. Invasive communities are dominated by invasive alien species. Although these communities are often casually considered as “planted/cultivated,” they are spontaneous, self-perpetuating, and not the (immediate) result of planting, cultivation, or human maintenance. Land occupied by invasive communities is generally permanently altered (converted) unless restoration efforts are undertaken. It is also important to recognize that these communities are novel; they are not merely a community “transplanted” from the native range of the dominant species. *Melaleuca* in south Florida, kudzu in the southeastern United States, tamarisk in the western United States, and red mangrove in Hawaii all form communities which have no equivalent in the native range of the dominant species (associated species, processes, landscape context, fauna, etc., are all significantly different).

Reasons: Reasons that the Heritage Conservation Status Global Rank for the Association was assigned, including key ranking variables and other considerations used.

CLASSIFICATION INFORMATION

Status: The status of the Association in relation to the standard USNVC. Values for Classification Status are:

Standard - the Association has been formally recognized, described, and accepted by NatureServe Central Ecology as a standard Association in the USNVC.

Nonstandard - the Association has not been accepted by NatureServe Central Ecology as a standard Association (i.e., it does not follow the standard classification).

Provisional* - the Association is a candidate for acceptance into the standard classification but has not yet been comprehensively reviewed by NatureServe Central Ecology.

Confidence: The degree of confidence associated with the classification of the Association. This confidence is based on the quality and type of data used in the analysis, as well as the extent to which the entire (or potential) range of the Association was considered. Values for Circumscription Confidence are:

1 – Strong: Classification is based on quantitative analysis of verifiable, high-quality field data (species lists and associated environmental information) from plots that are published in full or are archived in a publicly accessible database. A sufficient

number of high-quality plots covering the expected geographic distribution and habitat variability of the vegetation type, as well as plots from related types across the region, have been used in the analysis.

- 2 – Moderate: Classification is based either on quantitative analysis of a limited data set of high-quality, published/accessible plots, and/or plots from only part of the geographic range, or on a more qualitative assessment of published/accessible field data of sufficient quantity and quality.
- 3 – Weak: Classification is based on limited, or unpublished/inaccessible plot data or insufficient analysis, anecdotal information, or community descriptions that are not accompanied by plot data. These types have often been identified by local experts. Although there is a high level of confidence that these types represent recognized vegetation entities, it is not known whether they would meet national standards for floristic types in concept or in classification approach if sufficient data were available.

Comments: Comments about classification criteria used to define the Association, or to describe any remaining issues associated with the classification. Any potentially confusing relationships with other existing Associations should be indicated if there is a potential that further scrutiny may result in a change in the classification of the Association. Discussion of any atypical occurrences and why they are included in this Association concept may also be addressed. In addition, rationale for choosing nominal species that are not dominant and other comments about nominal species pertaining to the classification of the Association should be included. Comments may explain confusion about the similarity between types that may not be distinguishable.

Similar Associations: The Global Name and Elcode of any closely related or apparently similar USNVC association(s) which may be mistaken for this Association. They may be in the same or different Formation or Alliance. This includes only types whose classification is not at issue (e.g., two types have similar sounding names but are differentiated by the degree of canopy closure and lower frequency of associated light-requiring species). Notes regarding the relationship and/or distinction of each particular Similar Association may follow.

Related Concepts: Name used by agencies or other published or unpublished classification systems to describe Associations that may be related to this Association. These might include Society of American Foresters (SAF) cover types, Kuchler PNV types, U.S. Fish and Wildlife Service (USFWS) wetland types, or other local or regional vegetation classifications. The Other Community Name is followed by the associated Reference and Relationship. The Related Concept Reference is the source reference for the Related Concept. Relationship indicates whether the type designated in Other Community Name is more, less, or equally inclusive of the USNVC Association concept. Values for Relationship are:

- B – Broader: the concept of the Other Community is broader than the Association concept
- F – Finer: the concept of the Other Community is finer (more narrow) than the Association concept

- I – Intersects: the concepts of the Other Community and the Association overlap (i.e., neither fully includes the other) and are related in a way that is more complex than a simple “broader/finer” relationship
- = – Equivalent: concept designated in Other Community Name is equivalent to the Association concept
- ? – Unknown: the relationship of the Other Community to the Association has not been determined

Note: Names used by the NHPs are listed in the section entitled Subnational Distribution with Crosswalk data.

SOURCES

Description Authors: Name(s) of the person(s) primarily responsible for authorship of the current version of the Association’s *description* and *characterization* including descriptions in Environment, Vegetation, and Dynamics. The abbreviation mod. before a name indicates that modifications were subsequently made to the original description by the person(s) listed.

References: Short citations of all references used in documenting the classification/concept and characterization of this Association.

Appendix K. Key to the vegetation classes at Petersburg National Battlefield.

1a	Vegetation of uplands: vegetation not influenced by flooding or groundwater.	2
1b	Vegetation of wetlands: vegetation of swamps, floodplains, or groundwater seepage.	12
2a	Forested vegetation: vegetation dominated by trees (tall, single-stemmed woody plants) with canopy coverage of at least 25%.	3
2b	Non-forested vegetation: dominated by shrubs (shrublands or scrubby vegetation, short trees or multi-trunked woody plants) or herbaceous plants.	10
3a	Mostly deciduous forest: loblolly pine (<i>Pinus taeda</i>) makes up less than 30% of overall polygon (canopy).	4
3b	Evergreen or mixed evergreen-deciduous forest: loblolly pine (<i>Pinus taeda</i>) makes up greater than 30% of the overall polygon (canopy).	9

UPLAND DECIDUOUS FORESTS

4a	Deciduous forests on rolling uplands with small stream drainages.	5
4b	Deciduous forests on eroding, steep river bluffs with an open canopy of common hackberry (<i>Celtis occidentalis</i>), tuliptree (<i>Liriodendron tulipifera</i>), black walnut (<i>Juglans nigra</i>), and American elm (<i>Ulmus americana</i>).	Disturbed Calcareous Forest
5a	Vegetation dominated by early successional or ruderal species such as tuliptree (<i>Liriodendron tulipifera</i>), sweetgum (<i>Liquidambar styraciflua</i>), red maple (<i>Acer rubrum</i>); oaks (<i>Quercus</i> spp.) rare to absent; forest often even-aged.	6
5b	Middle to late successional deciduous forests with higher species diversity; mixed age classes; canopies of oaks (<i>Quercus</i> spp.), hickories (<i>Carya</i> spp.), American beech (<i>Fagus grandifolia</i>), and/or tuliptree (<i>Liriodendron tulipifera</i>).	7
6a	Sweetgum (<i>Liquidambar styraciflua</i>) dominated vegetation occurring as young even-aged, scrubby forest.	Successional Sweetgum Forest
6b	Tree canopy with low species diversity, mostly even-aged, characterized by dominance of tuliptree (<i>Liriodendron tulipifera</i>), sometimes with co-dominance by sweetgum (<i>Liquidambar styraciflua</i>) and/or red maple (<i>Acer rubrum</i>); oaks (<i>Quercus</i> sp.) and American beech (<i>Fagus grandifolia</i>) absent or of low cover; herb layer often characterized by sparse cover of herbs and vines or a carpet of Nepalese browntop (<i>Microstegium vimineum</i>).	Successional Tuliptree Forest

- 7a Xeric forests with canopies dominated by oaks (*Quercus* spp.) and with ericaceous shrubs like huckleberries (*Gaylussacia* spp.) and blueberries (*Vaccinium* spp.) or leaf litter dominating the ground layer with little to no herbaceous species present. **Coastal Plain Mixed Oak / Heath Forest**
- 7b Mesic to submesic forests with canopies dominated by oaks (*Quercus* spp.), American beech (*Fagus grandifolia*), and/or tuliptree (*Liriodendron tulipifera*) and with hickories (*Carya* spp.) often prominent. 8
- 8a Forests of mesic slopes and ravines dominated by various mixtures of American beech (*Fagus grandifolia*), tuliptree (*Liriodendron tulipifera*), white oak (*Quercus alba*), and northern red oak (*Quercus rubra*); characteristic associates are white ash (*Fraxinus americana*), American holly (*Ilex opaca* var. *opaca*); ground layer may be bare or with only sparse herbs. **Mesic Mixed Hardwood Forest**
- 8b Mature, submesic forests of rolling uplands and lower slopes dominated by mixtures of oaks (*Quercus* spp.) and hickories (*Carya* spp.); low shrub / herb layer sparse in cover, but diverse in species with mixtures of woody seedlings, sedges, grasses, and forbs. **Acidic Oak - Hickory Forest**

UPLAND EVERGREEN OR MIXED EVERGREEN-DECIDUOUS FORESTS

- 9a Early-successional or planted evergreen forests of young loblolly pine; successional hardwoods may occur as shrubs or in the subcanopy, but rarely break into the canopy; subcanopy, if present, is of young (small - medium diameter) trees; signature is fine textured, with small tree crowns. **Loblolly Pine Plantation / Early-Successional Loblolly Pine Forest**
- 9b Larger-statured, older forests ranging from mostly evergreen to mixed evergreen-deciduous with tree canopies of mature loblolly pine (*Pinus taeda*) mixing with tuliptree (*Liriodendron tulipifera*) and/or sweetgum (*Liquidambar styraciflua*); loblolly pine (*Pinus taeda*) can also occur as an older, emergent canopy over the hardwood species; the ground cover is pine litter, but can have high cover of vines, stilt grass, or scattered herbs. **Loblolly Pine - Hardwood Forest**

NON-FORESTED VEGETATION

- 10a Vegetation dominated by herbs; trees and shrubs, if present, occur at less than 25% cover; open fields dominated by a dense mix of native and European grasses and forbs or planted with an agricultural crop. **Cultural Meadow**
- 10b Vegetation woody; shrubs, vines and scattered trees characteristic. 11
- 11a Sweetgum (*Liquidambar styraciflua*) dominated vegetation occurring as young even-aged shrublands. **Successional Sweetgum Forest**
- 11b Dense thicket of tall shrubs or vines, or combination of both; bordering roads and meadows; typical species can include both nonnative species: tree of heaven (*Ailanthus altissima*), white mulberry (*Morus alba*), paper mulberry (*Broussonetia papyrifera*), Japanese honeysuckle (*Lonicera japonica*), and native species: Eastern redcedar (*Juniperus virginiana* var. *virginiana*), eastern poison ivy (*Toxicodendron radicans*), frost grape (*Vitis vulpina*), and blackberries (*Rubus* spp.). **Successional Mixed Scrub**

WETLAND VEGETATION

- 12a Wetland vegetation dominated by trees with a forest canopy. 13
- 12b Wetland vegetation dominated by shrubs and small trees, with herbaceous openings; typical species include hazel alder (*Alnus serrulata*), smallspike false nettle (*Boehmeria cylindrica*), threeway sedge (*Dulichium arundinaceum*), wartremoving herb (*Murdannia keisak*), arrowleaf tearthumb (*Polygonum sagittatum*), American bur-reed (*Sparganium americanum*). **Beaver Wetland Complex**
- 13a Forested wetlands of narrow ravine bottoms or associated with small stream floodplains; typically narrow features associated with stream banks, sandy stream terraces, or ravine bottoms; hydric oaks, if present, are not common or dominant. 14
- 13b Forests on broad flats with seasonally flooded hydrology; not associated with the main stream channel and never inundated by stream waters, although water table is at or near the surface during most of the growing season; canopy characterized by mixtures of red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), and loblolly pine (*Pinus taeda*) with willow oak (*Quercus phellos*) usually present either in the canopy, subcanopy, or shrub layers; the ground may be mostly bare, covered with matted leaf the ground may be mostly bare, covered with matted leaf litter and mud, with scattered patches of wetland grasses and sedges. **Coastal Plain / Piedmont Floodplain Swamp Forest (Mixed Oak - Red Maple Type)**
- 14a Forests associated with banks or channels of small streams, receiving at least occasional stream flooding; canopy is dominated by red maple (*Acer rubrum*), tuliptree (*Liriodendron tulipifera*), and / or sweetgum (*Liquidambar styraciflua*), with various mixtures of river birch (*Betula nigra*), green ash (*Fraxinus pennsylvanica*), black walnut (*Juglans nigra*), American sycamore (*Platanus occidentalis*), and American elm (*Ulmus americana*). **Coastal Plain / Piedmont Small-Stream Floodplain Forest)**
- 14b Forests of narrow ravine bottoms with a saturated hydrology; substrate mucky, with hummock and hollow microtopography and patches of peat mosses (*Sphagnum* spp.); canopy characterized by red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), and black gum (*Nyssa sylvatica*); shrub layer often includes possumhaw (*Viburnum nudum*), sweetbay magnolia (*Magnolia virginiana*), and coastal sweet- pepperbush (*Clethra alnifolia*); herb layer is a dense mixture of graminoids, ferns, and forbs. **Coastal Plain / Piedmont Acidic Seepage Swamp**

As the nation's primary conservation agency, the Department of the Interior has responsibility for most of our nationally owned public land and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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