

**VASCULAR PLANT INVENTORY AND PLANT  
COMMUNITY CLASSIFICATION FOR CHICKAMAUGA AND  
CHATTANOOGA NATIONAL MILITARY PARK**



Report for the Vertebrate and Vascular Plant Inventories:  
Appalachian Highlands and Cumberland/Piedmont Network

Prepared by NatureServe for the National Park Service  
**Southeast Regional Office**  
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This report consists of the main report along with a series of appendices with information about the plants and plant communities found at the site. Electronic files have been provided to the National Park Service in addition to hard copies. Current information on all communities described here can be found on NatureServe Explorer at [www.natureserve.org/explorer](http://www.natureserve.org/explorer).

**Cover photo:** Cedar glades, a significant biological component of Chickamauga and Chattanooga National Military Park. Photo by Tom Govus.

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**Vascular Plant Inventory and Plant Community Classification for  
Chickamauga and Chattanooga National Military Park**

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## Summary

The first step in any effort to monitor the “vital signs” or ecological health of a tract of land is to develop a baseline from which to measure and gauge trends. We established a baseline for Chickamauga and Chattanooga National Military Park in three ways:

- 1) Ecologists from NatureServe established 35 permanently marked one-hectare circular plots within the park in a grid system and another 14 plots in unique ecological areas that were not covered by the initial grid-based plot layout. The permanently marked plots are available to be used by researchers on studies ranging from bird point counts to individual plant monitoring. Five additional quickplots (non-permanent) were established to further document unusual or ecologically significant associations.
- 2) Ecologists collected data on all unique vegetation communities within the park and identified 25 natural and eight human-modified or successional vegetation associations (unique ecological assemblages of plants) within the park boundary. Other ecological communities may occur within the park, but we are confident that we have documented at least 90% of the communities from our field work. The most globally rare community in the park appears to be the Central Limestone Glade. This dry, exposed limestone community warrants special attention due to its relatively high global rank/rarity (G2G3) and abundance of globally rare and state ranked rare species. Other highly ranked communities include the Interior Low Plateau Chinquapin Oak - Mixed Oak Forest, Interior Plateau Chinquapin Oak - Shumard Oak Forest, Cumberland Plateau Willow Oak Pond, Southern Ridge and Valley Annual Grass Glade and the Limestone Seep Glade.
- 3) Ecologists collected and vouchered 237 specimens, all of which were new to the park. These species were added to an existing list that included vouchers from projects done by earlier researchers. We now count 902 documented species, varieties, or subspecies of vascular plants in the park (880 species). We estimate that between 93% and 100% of the vascular flora of the park is now documented. In the park, many of the most highly ranked species in terms of global or local rarity are associated with the limestone glades. These include glade quillwort (*Isoetes butleri*), flat-stemmed spikerush (*Eleocharis compressa*), Great Plains ladies-tresses (*Spiranthes magnicamporum*), glade St. Johnswort (*Hypericum dolabrifforme*), Gattinger prairie clover (*Dalea gattingeri*), gladecress (*Leavenworthia exigua* var. *exigua*) and cutleaf meadow-parsnip (*Thaspium pinnatifidum*). One federally listed plant is also found in the park. Large-flowered skullcap (*Scutellaria montana*) occurs as a part of the hardwood forest habitats at Lookout Mountain. This species is listed as Threatened by the US Fish and Wildlife Service.

## Introduction

Effective management of natural resources in our national parks relies upon ready access to comprehensive and scientifically credible information on species and habitats found within park boundaries. National Park Service units are currently compiling the information needed to begin to assess the current state of natural resources at specific parks. A few have begun to track and assess trends over time. With the passage of the National Parks Omnibus Management Act of 1998 by Congress, the National Park Service was given the mandate to “undertake a program of inventory and monitoring of National Park System resources to establish baseline information and to provide information on the long-term trends and the condition of National Park system resources.” Funding for this initiative was appropriated in fiscal year 2000. In August 2002, NatureServe began work on the vascular plant inventory portion of the project at Chickamauga and Chattanooga National Military Park.

Although Chickamauga and Chattanooga National Military Park is better known for its historic importance in the Civil War, the park contains significant natural resources, especially in its limestone based cedar glade complex. After assessing the past and current state of research in the park, we began to work on accomplishing three primary objectives:

- 1) Establish a minimum of 42 permanent plots throughout the park for present and future monitoring purposes.
- 2) Document all ecological communities on the site as defined by the United States National Vegetation Classification (Grossman et al. 1998, Anderson et al. 1998).
- 3) Collect any species of vascular plants found in plots that were not already documented by previous studies including Van Horn (1981), Dickson and Nixon (1989), Sutter et al. (1994) and Rogers (2000)

The ultimate goal of the project is to deliver the information described in this report to all interested parties, to inform land management, conservation priorities, and future research at the park, and to ensure that future generations of visitors will visit a park that is both ecologically and historically intact.

## Study Area

Chickamauga and Chattanooga National Military Park currently consists of four major land parcels totaling more than 8,900 acres straddling the Georgia – Tennessee border. Chickamauga Battlefield is located in Catoosa and Walker County, Georgia and forms the largest management unit of the park, consisting of 5,283 acres within Chickamauga Valley. Elevations vary from 680 to 950 feet. In addition to its significance as the site of a major civil war battle, this area has numerous exposures of Ordovician dolomite and limestones of the Knox and Chickamauga Groups (Jim Renner, pers. com.). This provides the substrate for the ecologically important cedar glade system within the park. It is located in the Southern Limestone/Dolomite Valley and Low Rolling Hills subsection of the Southern Ridge and Valley Ecoregion (Griffith et al. 2001).

The second largest management unit is Lookout Mountain Battlefield and Point Park (2,689 acres), which is located in Hamilton County, Tennessee and Walker County, Georgia. This area is a part of the Southern Table Plateaus subsection of the Southwestern Appalachian Ecoregion. It is closely related and similar to the Cumberland Plateau and consists of Pennsylvanian-age sandstone cap rock with associated shale and limestone layers below (Griffith et al. 2001). Elevations vary from 620 feet at Lookout Creek to

nearly 2000 feet at Point Park. This area has spectacular sandstone cliffs on top and heavily forested habitat on the mid to lower slopes of Lookout Mountain

There are several small holdings outside of the core area of the park. One of the larger areas is the Sherman Reservation, located on Missionary Ridge adjacent to the city of Chattanooga. We established two plots within this unit and they document heavily disturbed urban forest habitat.

A new management unit was added during the course of this study and was included in the sampling design. This area is called Moccasin Bend and is located on a bend in the Tennessee River due west of Chattanooga and consists of about 740 acres. This area is an important archaeological site for Native Americans. It consists of sandstone bluffs along the east side of the peninsula of land that creates the bend in the river, and low lying ground on the west side of the tract. This area has been highly disturbed by deposition of spoil dirt to build up the low lying ground (Jeff Duncan, pers. comm.) and is largely in an early successional stage with many non-native species. Elevations range from 650 – 800 feet.

The park has a diversity of soils ranging from sandy loams to cherty clays that have resulted from the erosion of the various geologic substrates found here including sandstones, chert, shale and several types of limestone. For the Southern Limestone/Dolomite Valley and Low Rolling Hills portion of the park at Chickamauga Battlefield, the major soil series include the Fullerton, Shack, Bodine groups on uplands and the Chewacla group on floodplains. For the Lookout Mountain area, the major soil series associated with the Southern Table Plateaus subsection includes the Hartsells, Townley, Gorgas and Enders groups.

The climate in northwestern Georgia and southeastern Tennessee consists of mild winters and warm/hot summers. Climate records from the National Weather Service show that the average daily minimum winter temperature is 30 degrees F whereas the average daily maximum summer temperature is 88.7 degrees F. The average rainfall is about 54.5 inches annually, the length of frost-free growing season is about 185 days, and the snow cover averages about 4.8 inches annually (National Weather Service 2006).

## ***Land History***

Chickamauga and Chattanooga National Military Park was created by an act of Congress in 1890 to preserve an important Civil War battlefield. It represents the first National Military Park established within the United States. Before the time of the war and the establishment of the park, the area served as pastureland, cropland, sites for homes, and homesteading for a fairly substantial population of early settlers. Before this period, the land was used by native Americans for a period of many hundred years. Anthropogenic disturbance has had a serious impact on the vegetation of this site for at least two hundred years. It is generally recognized that the native Americans, in presettlement times, used fire frequently to keep habitats open and to drive game. The land upon which the park is located was sparsely settled at the time of battle and consisted of woodland, field, and forest prior to the Civil War (Hanson and Blythe, 1999). Since the time of battle much of the land upon which the park now sits was more heavily settled, logged, grazed, and used to raise crops. These settlers also employed fire as a land management technique. Since the establishment of the park, a major effort has been made to retain the historic setting of the park and keep the relationship of woodlands and cleared pasture land as they were at the time of the battle. The use of fire has been largely excluded from this site with a few exceptions since it was acquired as a National Military Park in 1890. Experimentation with prescribed burning was conducted during the 1970's, but difficulties with this effort have put further fire management activities on hold (Jim Szykowski, pers. comm.).

## Methods

The inventory and monitoring project covers two main areas: permanent plot establishment for future research in the park; and a vegetation classification of all the vegetation associations within the park according to the National Vegetation Classification (Grossman et al. 1998). In addition, our team collected any observed vascular plants that were not already documented on the existing list for this park.

### ***Permanent plot establishment***

In order to set up a gridded system of one-hectare circular plots within the park boundary as mandated by the *Study Plan for Vertebrate and Vascular Plant Inventories* (Nichols 2000), Brigitte O'Donoghue from NatureServe used GIS layers supplied by the National Park Service's Cumberland Piedmont Network. She manipulated the GIS layers supplied to us with the program ArcView (ArcView 1992). We chose a 56-meter buffer around the current park boundary since each point represents the center of a one-hectare circular plot and we did not wish to sample any private holdings outside of the park. With this buffer in place, Brigitte established an evenly spaced grid system (we chose the approximate grid size of 960 meters by 960 meters *a priori* based on observations made by a team of park service personnel in 2000 (Nichols 2000)). At each north-south and east-west line intersection, we recorded the coordinates for one grid point (Figure 1 and Table 1).

Once we had fully laid out the grid using ArcView and recorded all of the GPS coordinates for use onsite, we identified areas of the park that were most likely to hold unique associations not represented by the gridded points. We added points in various places, including the sandstone cliffs of Lookout Mountain, floodplain associations on Lookout Creek and unusual successional habitats. We flagged these areas for visits and established plots there and in other suitable habitat that was not represented by the gridded plots. A map of all plot numbers and locations is shown in Figure 1.

Once at the park, we met with park personnel and local researchers, described the project's goals, and asked for their collaboration in the project. Through this process, we identified priority areas of the park for additional plot establishment and species inventory. During the field seasons of 2002, 2003, 2005 and 2006 we established 30 plots on the grid system and an additional 19 full plots and 5 "quickplots" off of the grid in habitats not covered by any of the pre-established points (Figure 1). Three of the gridded plots were established on the newly acquired property at Moccasin Bend in the Fall of 2005, along with five additional off-grid plots. Several discretionary plots were targeted at the limestone glade plant associations. For gridded plots, using the GPS units (Garmin Corp. 1999), we attempted to position ourselves within at least five meters of the "real" map location (the hypothetical location that we created in the lab prior to visiting the site). Once we were within five meters, we monumented each plot with a one foot piece of aluminum conduit and a small blue anodized aluminum tag with a distinctive number attached to an adjacent distinctive tree. General written directions to each permanent plot exist on the vegetation plot sheets filled out during the course of fieldwork and can also be found in the Access database archive of plot information held by the National Park Service. Due to variation in signal strength, accuracy may be more than five meters in some cases. In 2003 and 2005, we recorded additional data at each point regarding spring ephemerals or other plants not recorded during the initial visit.

### ***Vegetation classification***

After the establishment of each permanent one-hectare plot, we visually surveyed the area. We chose a representative and relatively homogenous 20 by 50-meter section of the hectare in which to place our standardized vegetation monitoring plot. Within the plot, we measured environmental characteristics and identified every vascular plant within the plot (see Appendix I for a blank version of the data sheets used). We assigned each species a cover value by strata and an overall cover value for the plot based on a modified Braun Blanquet cover class scale. In addition, we searched for and identified any species within the full hectare that were not represented in the 20 by 50-meter sample. Finally, we returned in the Fall of 2002 and Summer of 2003 to resample the plots to attempt to document any species that we had missed the previous summer. Detailed location information for each plot was recorded on the data sheets and is archived to assist with relocation of plots.

We proofed the plot sheets, entered the data into the NatureServe's PLOTS database, and assigned each plot to an association based on floristic composition and environmental factors using the National Vegetation Classification (Anderson et al. 1998, Grossman et al. 1998). We compared the plots with similar plots in other parks in the Southern Cumberland and Ridge and Valley as well as the Interior Low Plateau and with written descriptions of each related classification unit. These comparisons, combined with a thorough review of all classification possibilities and a review of the literature for some of these association types, allowed us to produce the current park vegetation classification.

### ***Vascular plant inventory***

While gathering plot data, we occasionally discovered plant species within the plots that had not already been documented. We collected any new specimens encountered within the plots and recorded the GPS coordinates using a Garmin GPS unit. We pressed and thoroughly dried all specimens, identified any unknowns that could be identified, and then vouchered all new species according to National Park Service standards using the Integrated Taxonomic Information System (ITIS) as the naming standard.

To assess the success of past inventories, we used the program PC-ORD (McCune and Grace 2002, McCune and Mefford 1999) to create a species area curve using the data gathered at each one-hectare plot. In addition, we used a jackknife method within PC-ORD to estimate the total number of species found in the park (Palmer 1990). This method used the formula  $JACK1 = SO + r1[n-1]/n$  where  $SO$  is the number of species observed in  $n$  quadrats,  $r1$  is the number of species present in only one quadrat, and  $n$  is the number of plots sampled.

## Results

During the species inventory work, we encountered and collected 238 specimens (Tables 2,3). We created 237 vouchers for the herbarium of the University of Tennessee Chattanooga (Table 3) from the plants we collected and photographed. These specimens supplement other plants collected at this site by Van Horn (1981), Dickson and Nixon (1989), Sutter et al. (1994) and Rogers (2000).

In addition to collecting all new plants encountered within the plots, we estimated what percentage of the flora in the park is now documented. Eliminating all varieties, subspecies, and questionable identifications and including previously collected specimens, we believe that researchers have documented 880 species for the park. The estimates of the number of total species in the park that we generated using PC-ORD based on the plot data taken throughout the park were between 845 and 944 species using all 49 full plots and between 704 and 807 species using just the 30 gridded full plots (Table 4). In addition, we calculated alpha (average species richness per plot), beta (measure of the heterogeneity of the data (alpha/gamma)), and gamma (total species overall plots) diversity values for the park based on information gathered from the plot data (Table 4). The alpha value for all plots combined was 61.4, the beta value was 10.3, and the gamma value was 512.

Using the information gathered in each plot, we discerned 33 distinct vegetation associations within nine distinct ecological systems (not including human modified or exotic community types), as defined by the United States National Vegetation Classification (Table 5) and another six communities that are likely in the park but that weren't found in our search effort. However, only 25 of the communities identified during this effort are considered "natural" as opposed to "semi-natural", "human modified/successional" or "exotic species dominated". The common names of all of the communities are as follows (\* = human modified/successional; *italics* = not documented in park, but probably present):

- \*White Pine Plantation
- \*Virginia Pine Plantation
- \*Mid- to Late-Successional Loblolly Pine - Sweetgum Forest
- \*Interior Mid- to Late-Successional Loblolly Forest
- \*Red-cedar Successional Forest
- \*Successional Black Walnut Forest
- \*Successional Sweetgum Forest
- \*Successional Tuliptree Bottomland Forest
- \*Successional Tuliptree Forest (Circumneutral Type)
- Cumberland Plateau Dry-Mesic White Oak Forest
- Rich Low-Elevation Appalachian Oak Forest
- Highland Rim White Oak - Tuliptree Mesic Lower Slope Forest*
- Ridge-and-Valley Dry-Mesic White Oak - Hickory Forest
- White Oak - Post Oak Subcalcareous Forest
- Southeastern Interior Southern Red Oak - Scarlet Oak Forest
- Appalachian Sugar Maple - Chinquapin Oak Limestone Forest
- Interior Low Plateau Chinquapin Oak - Mixed Oak Forest
- Interior Plateau Chinquapin Oak - Shumard Oak Forest
- Xeric Ridgetop Chestnut Oak Forest
- Interior Low Plateau Chestnut Oak - Mixed Oak Forest
- Dry-Mesic Southern Appalachian White Oak - Hickory Forest
- Box-elder Floodplain Forest
- Sycamore - Silver Maple Calcareous Floodplain Forest

Rich Levee Mixed Hardwood Bottomland Forest  
Southern Interior Oak Bottomland Forest  
\*Black Willow Riparian Forest  
Cumberland Plateau Willow Oak Pond  
\*Highland Rim Semi-natural Red-cedar - Oak Forest  
Southern Blue Ridge Escarpment Shortleaf Pine - Oak Forest  
\*Chinese Privet Shrubland  
*Black Willow Riverbank Shrubland*  
Central Basin Limestone Glade Margin Shrubland  
*Cultivated Meadow*  
Piedmont/Mountain Semi permanent Impoundment (Montane Boggy Type)  
Limestone Seep Glade  
Central Limestone Glade  
Smartweed - Cutgrass Beaver Pond  
Southern Ridge and Valley Annual Grass Glade  
Cumberland Plateau Sandstone Cliff (Dry Type)  
Appalachian Talus Slope

While working in the park, we also captured digital images of plots and plants. These images are indexed (Table 6) and a selection of them can be seen in Appendix III.

Finally, we have included the key to associations (Appendix IV). This tool helps those with a basic understanding of vegetation to classify community types within the park based on vegetation composition.

## Discussion/Conclusions

### Species Inventory

The field work from this project added 237 new specimens to the documented plants at the park and brought the total list of species in documented in the park to 880. One goal of the Inventory and Monitoring program of the National Park Service is to document at least 90% of the vascular flora of the park. Using various estimates and assumptions, the estimate for total number of species in the park ranged from 704 to 944. First-order jackknife estimates often underestimate number of species as evidenced by the lowest estimate in our first-order jackknife, whereas second-order jackknife estimates often overestimate the number of species (McCune and Grace 2002). Using all of the plot data (Figure 2), according to the jackknife estimates we have documented between 93% and 100% of the species in the park. Based on our own knowledge of the park and our belief that we have supplemented the work of previous researchers [Van Horn (1981), Dickson and Nixon (1989), Sutter et al. (1994) and Rogers (2000)], we feel that 90% of the vascular flora of the park is documented. The species area curve numbers we generated should only be used as an estimate, since tests of these indices have shown even the best ones to routinely underestimate the number of species in a park. Since we did sample systematically and without bias, we most likely have a more accurate number than if we had sampled only in areas that were of similar vegetation or only focused on particular parts of the park (Palmer 1990, McCune and Grace 2002).

For a park set aside principally for historic preservation, Chickamauga and Chattanooga National Military Park has a high diversity of ecologically significant community types ranging from temporarily flooded bottomlands to rich forested slopes to very dry/xeric calcareous glades. Although a significant amount of acreage within the park is moderately early successional or mowed or maintained grassland, the majority of the park contains forests of at least 70 years of age. The most globally rare community in the park without question is the Central Limestone Glade. This unique dry limestone community with seepage areas warrants special attention due to its high global rank/rarity (G2G3) and abundance of species of special concern. The surrounding landscape appears to show evidence of fire suppression and woody plants appear to be encroaching upon this association. Other highly ranked communities that are notable here include the Interior Low Plateau Chinquapin Oak - Mixed Oak Forest (G3), Interior Plateau Chinquapin Oak - Shumard Oak Forest (G3), Cumberland Plateau Willow Oak Pond (G3), Southern Ridge and Valley Annual Grass Glade (G2,G3) and the Limestone Seep Glade (G2?). Each of these forests takes up a relatively small percentage of the land area but holds a relatively large percentage of the overall biodiversity of the park.

There is one federally listed plant species that occurs in the park in association with the forested ecosystems of Lookout Mountain in Tennessee (*Scutellaria montana* – large-flowered skullcap – federally listed as threatened). However, a large number of species occur as an integral part of the limestone glade complex that are listed as special concern by the Georgia Natural Heritage Program (Patrick et al., 1995). Many of these species are either endemic to glade environments or disjunct from prairie ecosystems. A short list of these species along with their global rank would include:

<b>Scientific name</b>	<b>Common name</b>	<b>GA S-rank</b>	<b>G-rank</b>
<i>Bouteloua curtipendula</i>	side-oats grama grass	S2	G5
<i>Dalea candida</i>	white-tassles	S1	G5
<i>Dalea gattingeri</i>	Gattinger prairie clover	S2S3	G3G4

<i>Eleocharis compressa</i>	flat-stemmed spikerush	S2S3	G4
<i>Hypericum dolabriforme</i>	glade St. Johnswort	S3	G4
<i>Isoetes butleri</i>	glade quillwort	S1	G4
<i>Leavenworthia exigua</i> var. <i>exigua</i>	gladecress	S2	G4T3
<i>Pediomelum subacaule</i>	Nashville breadroot	S2	G4
<i>Spiranthes magnicamporum</i>	Great Plains ladies-tresses	S1	G4
<i>Sporobolus heterolepis</i>	prairie dropseed	S1	G5
<i>Thaspium pinnatifidum</i>	cutleaf meadow-parsnip	S1	G3?

This brief list illustrates the unique composition of these glade systems and gives a rough idea of the ecological significance that these limestone communities possess.

A few additional rare species or species of special concern were located during this effort. They included narrow-leaf horse gentian (*Triosteum angustifolium* – Georgia S1?, Tennessee SNR, G5), barrens milkweed (*Asclepias hirtella* – Georgia S2, Tennessee S1, G5) and tuberous stoneroot (*Collinsonia tuberosa* – Georgia S3, Tennessee SNR, G3G4).

At least 15% (135 species) of the plant species in the park are not native to the region or continent. Most of these species were plantings or are harmless present day components of the flora that found their way into natural areas from plantings or errant seed mixes. However, at least 31 of the 135 exotic species found within the park are considered aggressive invasive species that are severe or significant threats and are actively out competing and replacing native species in other parts of the Southeast (Miller 2000). These species are probably the biggest single threat to the overall ecological health of the park at this point in time. In the interior woods and forests, shrubs and vines such as Japanese honeysuckle (*Lonicera japonica*), and privet (*Ligustrum sinense/vulgare*) all have begun to colonize areas of the understory. Chinese privet is becoming a problem in several of the limestone glades. Much of the floodplain for the creeks that run through the park is heavily dominated by a combination of exotics, but especially Japanese stilt grass (*Microstegium vimineum*) and Chinese privet. On the clifftops of Lookout Mountain, multiple species of non-native shrubby honeysuckle (*Lonicera spp.*) are displacing native shrubs and herbs through aggressive invasion. Other species that may need monitoring and attention to assure that they are not spreading include kudzu (*Pueraria montana*) and English ivy (*Hedera helix*), but the ones mentioned above seem to be the most likely candidates for control in the future. Garlic mustard (*Alliaria petiolata*) was identified for the park by Rogers (2000) but not observed during this study. This is a seriously invasive species, new to the southeast, and efforts should be made to identify locations and destroy incipient populations if they indeed exist. In areas where exotics have become a monoculture, removal should occur in conjunction with planting and seeding of natives to help prevent quick recolonization by the same or new invasive exotic species.

### **Vegetation community analysis**

The association is the finest level of the vegetation classification and is defined as “a plant community type of definite floristic composition, uniform habitat conditions, and uniform physiognomy” (Grossman et al. 1998). Ecological community information such as that gathered for this project and described in Appendix II can be very useful as a management and monitoring tool for the parks. Once identified to the association level, it is possible for land managers on a local scale to use the ecological community information gathered by researchers throughout the association’s range to make more informed decisions about how to manage locally. In addition to the information contained in Appendix II, we have included the “system” or broad ecological unit to which each association belongs, a global and local description for each association, specific information on the status of each association both globally and within the park,

possible threats to the association in the park, plants of concern found in the park, and management concerns where they apply:

### **White Pine Plantation**

Identifier: CEG007178

Like the association described above, this is a cultivated forest that was located only once along the floodplain of the Tennessee River at Moccasin Bend. This particular example has been heavily impacted by disease and windstorms, and as a result has an open canopy that is mixed with successional species. In addition to white pine (*Pinus strobus*), the canopy also includes a substantial mix of loblolly pine (*Pinus taeda*) and tulip poplar (*Liriodendron tulipifera*) and sweet gum (*Liquidambar styraciflua*). The invasive Chinese privet (*Ligustrum sinense*) was dominant in a thicket type shrub layer. Another invasive, Nepalese browntop (*Microstegium vimineum*) dominated the herb layer. Vine species such as Virginia creeper (*Parthenocissus quinquefolius*), Japanese honeysuckle (*Lonicera japonica*) and cross vine (*Bignonia capreolata*) were also prominent.

Again, this human influenced plant association lacks natural ecological value and should not be of concern from a management point of view.

### **Virginia Pine Plantation**

Identifier: CEG004730

This is a heavily disturbed, human created association and was only located once in the new management area of Moccasin Bend. This small stand was dominated almost entirely by Virginia pine (*Pinus virginiana*). A sparse shrub layer occurred under the canopy and included Eastern red-cedar (*Juniperus virginiana*), black cherry (*Prunus serotina*) and box-elder (*Acer negundo*) as well as the non-native shrubs Amur honeysuckle (*Lonicera maackii*) and privet (*Ligustrum sinense*). The herb layer was sparse and also largely made up of non-native species such as Japanese honeysuckle (*Lonicera japonica*) and Japanese stiltgrass (*Microstegium vimineum*).

As a human modified forest type, this vegetation has little to no value as natural habitat and is of little concern from a management standpoint. Consideration could be given to converting this to a natural forest type.

### **Mid- to Late-Successional Loblolly Pine - Sweetgum Forest**

Identifier: CEG008462

This successional community was also infrequent within the park and restricted to the newly acquired tract at Moccasin Bend. Stands have a canopy largely dominated by loblolly pine (*Pinus taeda*) and sweet gum (*Liquidambar styraciflua*). Some other trees that can occur in the canopy and subcanopy include Virginia pine (*Pinus virginiana*), willow oak (*Quercus phellos*), water oak (*Quercus nigra*), black oak (*Quercus velutina*) and tulip poplar (*Liriodendron tulipifera*). Black willow (*Salix nigra*) occurs in bottomland examples while hackberry (*Celtis occidentalis*) occurs in upland types. The exotic shrub, privet (*Ligustrum sinense*), is present in both situations. The herb layer is largely dominated by Nepalese browntop (*Microstegium vimineum*) with abundant vines including Japanese honeysuckle (*Lonicera japonica*), poison ivy (*Toxicodendron radicans*), muscadine (*Vitis rotundifolia*) and wisteria (*Wisteria sinense*).

This association may eventually become a semi-natural type oak forest dominated by willow oak. The abundance of invasive non-native species makes it unlikely to provide habitat for native plants and of concern from a management point of view.

### **Interior Mid- to Late-Successional Loblolly Forest**

Identifier: CEGLO07105

This is yet another example of a human modified/successional forest type, and it was located only once at Chickamauga Battlefield. The composition of the forest here showed the influence of the limestone that is prevalent in this portion of the park. The canopy was strongly dominated by loblolly (*Pinus taeda*) but it also included white ash (*Fraxinus americana*), southern shagbark hickory (*Carya carolinae-septentrionalis*), shortleaf pine (*Pinus echinata*) and post oak (*Quercus stellata*). Sugarberry (*Celtis laevigata*) dominated the understory along with southern sugar maple (*Acer barbatum*), red mulberry (*Morus rubra*) and slippery elm (*Ulmus rubra*). The shrub layer was dominated by the privet (*Ligustrum sinense*) but also included redbud (*Cercis canadensis*). The herb layer was moderately well developed with mist flower (*Conoclinium coelestinum*) and Cherokee sedge (*Carex cherokeensis*) most prominent. Vine species in this example included supple-jack (*Berchemia scandens*) and trumpet vine (*Campsis radicans*).

This association should, in time, mature into one of the limestone oak – hickory type forests that are a part of the woodland/glade complex for this site. Fire may enhance and help promote the maturation and conversion of this successional forest into one of the natural forest types that occur in the park. This is a late successional type and probably resulted from land clearing activities from early settlers here.

### **Red-cedar Successional Forest**

Identifier: CEGLO07124

This forest type may be more widespread than our sampling indicates, but it was only located once during this study in the central portion of Chickamauga Battlefield. The example studied was strongly dominated by Eastern red-cedar (*Juniperus virginiana*), occurring in nearly all strata. A large number of widely scattered dead pine trees were also present (loblolly, shortleaf and Virginia pine). Other important canopy and subcanopy species were southern shagbark hickory (*Carya carolinae-septentrionalis*), post oak (*Quercus stellata*), red bud (*Cercis canadensis*) and white ash (*Fraxinus americana*). The shrub layer was sparse and made up of transgressive species from the canopy along with Carolina buckthorn (*Frangula caroliniana*) and Georgia hackberry (*Celtis tenuifolia*). The herbaceous layer was sparse but diverse and included nettle-leaved sage (*Salvia urticifolia*), little bluestem grass (*Schizachyrium scoparium*), lyre-leaved sage (*Salvia lyrata*), prickly pear cactus (*Opuntia humifusa*) and poverty grass (*Danthonia spicata*).

Like the association described previously, this forest type, should in time mature into a natural limestone oak – hickory association. Fire would also be of benefit in speeding up the conversion of this successional forest into a more natural forest type.

**Successional Black Walnut Forest**

Identifier: CEGLO07879

This successional forest is generally a small patch occurrence type that is located typically in the vicinity of old homesteads. The example discovered during this study made up only a portion of the standard plot. The canopy was strongly dominated by black walnut (*Juglans nigra*) with a moderately well developed shrub layer including coral berry (*Symphoricarpos orbiculatus*) and redbud (*Cercis canadensis*). The herbaceous layer was moderately well developed and dominated by Cherokee sedge (*Carex cherokeensis*) and lyre-leaved sedge (*Salvia lyrata*).

Black walnut is a fairly long lived tree and this association may persist for quite a while after the initial circumstances that led to its establishment. Eventually it should mature into one of the basic oak-hickory forests that are a part of the glade complex.

**Successional Tuliptree Forest (Circumneutral Type)**

Identifier: CEGLO07220

This is another infrequently occurring successional forest type for the park. It was located only once during the study at the Sherman Reservation. This was not a typical example from a vegetation composition point of view, but it fits the concept of a calcareous successional association very well. Due to the location of this stand within an urban environment, an abundance of non-native species was present. The canopy here was dominated by black cherry (*Prunus serotina*) and willow oak (*Quercus phellos*) with an understory of red mulberry (*Morus rubra*). The shrub layer was strongly dominated by the exotic shrub Amur honeysuckle (*Lonicera maackii*). Other shrubs included Chinese privet (*Ligustrum sinense*), winged elm (*Ulmus alata*), Carolina buckthorn (*Frangula caroliniensis*) and redbud (*Cercis canadensis*). The groundcover was made up of equal amounts of Japanese honeysuckle (*Lonicera japonica*) and poison ivy (*Toxicodendron radicans*).

This atypical example is quite mature and composed of very large specimens in the canopy. It will likely remain stable for a long period of time until the canopy layer undergoes senescence.

**Cumberland Plateau Dry-Mesic White Oak Forest**

Identifier: CEGLO08430

This association occurs on midslopes of Lookout Mountain over a mixture of dolomitic limestone and sandstone. The slope aspect is typically northwestern and sites are regarded as dry-mesic to slightly mesic. Elevations range of 1200 – 1400 feet. It has only rarely been documented and, at the present time, the full extent of this association and its distribution within the park is not known. The canopy includes a mixture of white oak (*Quercus alba*) and chestnut oak (*Quercus prinus*) with lesser amounts of black oak (*Quercus velutina*). The subcanopy and understory includes sourwood (*Oxydendrum arboreum*), black gum (*Nyssa sylvatica*), black cherry (*Prunus serotina*), red maple (*Acer rubrum*), flowering dogwood (*Cornus florida*) and pignut hickory (*Carya glabra*). Occurrences here lack the bigleaf magnolia (*Magnolia macrophylla*) found in Alabama examples of this association. The shrub layer is sparse to moderately developed with maple-leaved viburnum (*Viburnum acerifolium*), sassafras (*Sassafras albidum*) and sweetshrub (*Calycanthus floridus*). The herbaceous layer is moderately well developed and more diverse than examples of this type in other geographic areas. A sparse cover of black snakeroot (*Cimicifuga racemosa*), horsebalm (*Collinsonia canadensis*), lopseed (*Phryma leptostachya*), false Solomon's seal (*Maianthemum racemosum*), and wild geranium (*Geranium maculatum*) typified the

examples at Lookout Mountain. Vine species were also prominent including Virginia creeper (*Parthenocissus quinquefolia*), supple-jack (*Berchemia scandens*) and muscadine (*Vitis rotundifolia*).

Globally, this is a poorly documented plant association and occurrences at Chickamauga and Chattanooga National Military Park will provide important additional geographic and compositional information for this forest type.

### **Rich Low-Elevation Appalachian Oak Forest**

Identifier: CEG007233

This association occurs on north aspect gentle slopes over sandstone in the western portion of Chickamauga Battlefield. These are mesic sites with deep soils at elevations of about 820 feet. It is believed that this association is somewhat infrequent and limited to rich substrates in protected situations (coves or lower slopes).

The canopy is strongly dominated by white oak (*Quercus alba*) with lesser amounts of northern red oak (*Quercus rubra*) and mockernut hickory (*Carya alba*). Subcanopy and understory species include sugar maple (*Acer saccharum*), sourwood (*Oxydendrum arboreum*), flowering dogwood (*Cornus florida*) and sassafras (*Sassafras albidum*). The shrub layer is sparse with mostly transgressive species from the canopy. The herbaceous layer is moderately well developed and diverse with naked tick-trefoil (*Desmodium nudiflorum*), Christmas fern (*Polystichum acrostichoides*), horsebalm (*Collinsonia canadensis*), round-lobed liverleaf (*Hepatica nobilis* var. *obtusata*), Solomon's seal (*Polygonatum biflorum*), Bosc's panic grass (*Dichanthelium boscii*) and false Solomon's seal (*Maianthemum racemosum*).

This association could potentially provide habitat for large-flowered skullcap (*Scutellaria montana*).

### **Highland Rim White Oak - Tuliptree Mesic Lower Slope Forest**

Identifier: CEG007709

Sites for this forest type occur on lower slopes and small stream terraces where it may be infrequently flooded (very briefly). So far this community has only been documented once at Chickamauga Battlefield. These are mesic habitats and examples at Chickamauga and Chattanooga National Military Park appear to be acidic in nature and restricted to sandstone. It is likely to be widespread along the small perennial streams in the northwestern portion of Chickamauga Battlefield.

The canopy of the examples studied was dominated by white oak (*Quercus alba*) with lesser amounts of sweet gum (*Liquidambar styraciflua*), pignut hickory (*Carya glabra*), red maple (*Acer rubrum*), black gum (*Nyssa sylvatica*), willow oak (*Quercus phellos*), chestnut oak (*Quercus prinus*) and shortleaf pine (*Pinus echinata*). These later species occur in the canopy and subcanopy layers. The shrub layer tends to be sparse and primarily made up of transgressive hardwood species from the upper strata. Piedmont azalea (*Rhododendron canescens*), strawberry bush (*Euonymus americanus*), sparkleberry (*Vaccinium arboreum*), lowbush blueberry (*Vaccinium pallidum*) and Carolina buckthorn (*Frangula caroliniana*) were additional shrub species that can be a part of this community. The herbaceous layer tends to also be sparse to moderately well developed and made up of species associated with acidic and slightly flooded environments. slender spikegrass (*Chasmanthium laxum*), manna grass (*Glyceria striata*), calico aster (*Symphyotrichum lateriflorum*), Christmas fern (*Polystichum acrostichoides*), ironweed (*Vernonia flaccida*), Solomon's seal (*Polygonatum biflorum*), wild yam (*Dioscorea quaternata*) and yellow star

grass (*Hypoxis hirsuta*) are some of the more frequently occurring species. The edges of the stream were characterized by abundant sphagnum. The exotic Nepalese browntop (*Microstegium vimineum*) is also present in moderate amounts.

### **White Oak - Post Oak Subcalcareous Forest**

Identifier: CEGLO08443

This association occurs on the tops of low ridges at Chickamauga Battlefield on well drained soils associated with limestones of the Chickamauga Group at elevations of around 720 feet. Examples studied had a fairly strong component of loblolly pine that had been killed by southern pine beetle, indicating these areas are recovered from past clearing. It has only been documented at this site by one plot.

The canopy of the example studied was strongly dominated by a mixture of white oak (*Quercus alba*) and post oak (*Quercus stellata*). The subcanopy and understory was fairly well developed including winged elm (*Ulmus alata*), southern sugar maple (*Acer barbatum*), Eastern red-cedar (*Juniperus virginiana* var. *virginiana*), southern shagbark hickory (*Carya carolinae-septentrionalis*) and white ash (*Fraxinus americana*). The shrub layer was sparse with mostly hardwood species from the canopy but also including redbud (*Cercis canadensis*) and coral berry (*Symphoricarpos orbiculatus*). The herb layer also tends to be sparse and leaf litter generally comprises most of the groundcover. Some of the herbaceous species that did occur included slender spikegrass (*Chasmanthium laxum*), wild petunia (*Ruellia caroliniensis*), nutrush (*Scleria* sp.), Virginia snakeroot (*Aristolochia serpentaria*) and partridgeberry (*Mitchella repens*). Vines are moderately well represented with poison ivy (*Toxicodendron radicans*), muscadine (*Vitis rotundifolia*) and catbrier (*Smilax rotundifolia*) fairly frequent.

The co-dominance of white oak and post oak are a diagnostic feature of this association.

### **Southeastern Interior Southern Red Oak - Scarlet Oak Forest**

Identifier: CEGLO07247

This association occurs on the tops of low rolling ridgetops of dolomitic limestone. At Chickamauga Battlefield these sites typically were heavily impacted in the past by clearing and/or grazing. It has been infrequently documented.

Examples studied at Chickamauga had a canopy strongly dominated by southern red oak (*Quercus falcata*) and post oak (*Quercus stellata*) with lesser amounts of shortleaf pine (*Pinus echinata*), pignut hickory (*Carya glabra*) and white ash (*Fraxinus americana*). The subcanopy and understory layers were very dense with Virginia pine (*Pinus virginiana*), Eastern red-cedar (*Juniperus virginiana* var. *virginiana*), mockernut hickory (*Carya alba*) and slippery elm (*Ulmus rubra*). The shrub layer was also well developed and largely dominated by hardwood species from the canopy and understory, especially winged elm. Other minor shrub species included coral berry (*Symphoricarpos orbiculatus*) and Carolina buckthorn (*Frangula caroliniana*). The herbaceous layer is sparse and patchy with little bluestem grass (*Schizachyrium scoparium*), Virginia snakeroot (*Aristolochia serpentaria*), wild petunia (*Ruellia caroliniensis*), bedstraw (*Galium circaezans*) and catbrier (*Smilax glauca*) as the most frequently occurring species.

**Appalachian Sugar Maple - Chinquapin Oak Limestone Forest**

Identifier: CEGLO06017

This association was found on the lower slopes of Lookout Mountain and Missionary Ridge (Sherman Reservation) on limestone substrates in situations that are highly impacted by the proximity of urban environments (edge effects and non-native species). Elevations varied from 950 – 1100 feet. The examples studied were in more mesic situations than typical occurrences.

The canopy and subcanopy of examples studied were dominated by white ash (*Fraxinus americana*), sugar maple (*Acer saccharum*) and chinquapin oak (*Quercus muehlenbergii*). Southern sugar maple (*Carya carolinae-septentrionalis*), bitternut hickory (*Carya cordiformis*), slippery elm (*Ulmus rubra*) and white oak (*Quercus alba*) were also present to a lesser degree. The understory tends to be sparse and open including the species listed above along with sugarberry (*Celtis laevigata*), hop hornbeam (*Ostrya virginiana*) and silverbell (*Halesia tetraptera* var. *montana*). The shrub layer is sparse to patchy with redbud (*Cercis canadensis*), Carolina buckthorn (*Frangula caroliniana*), fragrant sumac (*Rhus aromatica*) and Eastern red-cedar (*Juniperus virginiana* var. *virginiana*). The herbaceous layer tends to be sparse or moderately well developed with heart-leaved aster (*Symphotrichum cordifolium*), Indian pink (*Spigelia marilandica*), common eastern brome (*Bromus pubescens*), common shorthusk (*Brachyelytrum erectum*), eastern blue star (*Amsonia tabernaemontana*) and perfoliate bellwort (*Uvularia perfoliata*) as the most frequently occurring species. Vines present include yellow passion flower (*Passiflora lutea*), coralbeads (*Cocculus carolinus*), cross vine (*Bignonia capreolata*) and Virginia creeper (*Parthenocissus quinquefolia*). Because of the proximity of these example to highways and urban environments, non-native species can be abundant including Amur honeysuckle (*Lonicera maackii*), Chinese privet (*Ligustrum sinense*) and Japanese honeysuckle (*Lonicera japonica*).

The combination of sugar maple, white ash and chinquapin oak in the canopy of this association is diagnostic.

**Interior Low Plateau Chinquapin Oak - Mixed Oak Forest**

Identifier: CEGLO07699

This association occurs at Chickamauga Battlefield on the tops of gentle, low ridges in a landscape of rolling topography on shallow soils over limestones of the Chickamauga Group. This area has had significant historic human impacts such as clearing and grazing in the early and latter part of the 1800s. These stands now have mature, widely spaced canopy trees and a dense understory that has resulted apparently from widespread fire suppression since this area was acquired as a military park in 1895. Elevations for these occurrences are at approximately 1000 feet.

The forests for examples at Chickamauga Battlefield are dominated by a mixture of chinquapin oak (*Quercus muehlenbergii*), southern red oak (*Quercus falcata*), Shumard oak (*Quercus shumardii*), and post oak (*Quercus stellata*) with lesser amounts of black oak (*Quercus velutina*) and red hickory (*Carya ovalis*). The subcanopy and understory includes blackjack oak (*Quercus marilandica*), Carolina buckthorn (*Frangula caroliniana*), redbud (*Cercis canadensis*), winged elm (*Ulmus alata*), Eastern red-cedar (*Juniperus virginiana* var. *virginiana*), black walnut (*Juglans nigra*) and southern shagbark hickory (*Carya carolinae-septentrionalis*). Coral berry (*Symphoricarpos orbiculatus*) and Carolina buckthorn (*Frangula caroliniana*) are the most important shrub species. The herb layer tends to be sparse but includes a fairly diverse assemblage of species. Eastern needlegrass (*Piptochaetium avenaceum*), wild bergamot (*Monarda fistulosa*), wingstem (*Verbesina occidentalis*), wild petunia (*Ruellia caroliniensis*), Bosc's witch grass (*Dichanthelium boscii*), Cherokee sedge (*Carex cherokeensis*), wild quinine

(*Parthenium integrifolium*) and wild comfrey (*Cynoglossum virginianum*) were some of the more conspicuous species found in this association.

The abundance of dry oak species such as southern red oak, post oak and blackjack oak, along with calcareous species such as chinquapin oak and Shumard oak is a diagnostic feature of this association.

### **Interior Plateau Chinquapin Oak - Shumard Oak Forest**

Identifier: C EGL007808

This association is widespread and generally surrounds the glade system. It occurs on the tops of low knobs in rolling topography over limestones of the Chickamauga Group in the Chickamauga Battlefield area. These are dry-mesic sites with well drained soils that are high in calcium and magnesium. Elevations average around 1000 feet.

The examples of this association that were studied had a varied canopy that always included substantial amounts of chinquapin oak (*Quercus muehlenbergii*) and Shumard oak (*Quercus shumardii*) along with southern shagbark hickory (*Carya carolinae-septentrionalis*), post oak (*Quercus stellata*), Eastern red-cedar (*Juniperus virginiana* var. *virginiana*), black walnut (*Juglans nigra*), shellbark hickory (*Carya laciniosa* – an unusual occurrence in Georgia), red hickory (*Carya ovalis*) and sometimes white oak (*Quercus alba*). A few examples also included shortleaf pine (*Pinus echinata*). Subcanopy and understory species that were common included slippery elm (*Ulmus rubra*), Georgia hackberry (*Celtis tenuifolia*), redbud (*Cercis canadensis*) and sugarberry (*Celtis laevigata*). The shrub layer generally was sparse with coral berry (*Symphoricarpos orbiculatus*), rusty haw (*Viburnum rufidulum*), Carolina buckthorn (*Frangula caroliniana*) and fragrant sumac (*Rhus aromatica*) as common species. The herbaceous layer tended to be sparse but diverse with nettle-leaved sage (*Salvia urticifolia*), black snakeroot (*Ageratina altissima*), wingstem (*Verbesina virginica*), wild senna (*Senna marilandica*), common eastern brome (*Bromus pubescens*), eastern needlegrass (*Piptochaetium avenaceum*), longleaf spikegrass (*Chasmanthium sessiliflorum*) and Bosc's witch grass (*Dichantheium boscii*). The non-native introduced shrub Chinese privet (*Ligustrum sinense*) is also sometimes a component of these forests.

This forest is the most common matrix that surrounds the limestone glades at Chickamauga Battlefield. It can be distinguished from the similar Interior Low Plateau Chinquapin Oak - Mixed Oak Forest by the absence of dry oak species such as southern red oak, post oak and blackjack oak. It presumably occurs in slightly more mesic situations.

### **Xeric Ridgetop Chestnut Oak Forest**

Identifier: C EGL008431

This association occurs on upper slopes with western exposures just below the sandstone cap of Lookout Mountain and also on the steep sandstone bluff of Moccasin Bend. These are xeric to dry-mesic sites with acidic soils and elevations ranging from 880 – 1500 feet.

Examples are characterized by a canopy strongly dominated by chestnut oak (*Quercus prinus*) with lesser amounts of scarlet oak (*Quercus coccinea*), black oak (*Quercus velutina*), sand hickory (*Carya pallida*), shortleaf pine (*Pinus echinata*) and loblolly pine (*Pinus taeda*). The subcanopy and understory layers include red maple (*Acer rubrum*), sourwood (*Oxydendrum arboreum*), black gum (*Nyssa sylvatica*), sassafras (*Sassafras albidum*) and flowering dogwood (*Cornus florida*). The shrub layer is sparse to patchy with deerberry (*Vaccinium stamineum*), lowbush blueberry (*Vaccinium pallidum*), Piedmont azalea (*Rhododendron canescens*), maple-leaved viburnum (*Viburnum acerifolium*) and highbush blueberry (*Vaccinium corymbosum*) being the most frequently encountered species. The herbaceous layer

is likewise sparse and generally makes up less than five percent of groundcover. Spotted wintergreen (*Chimaphila maculata*), naked tick-trefoil (*Desmodium nudiflorum*), tickseed sunflower (*Coreopsis major*), fringed loosestrife (*Lysimachia ciliata*), Curtis's goldenrod (*Solidago curtisii*) were some of the most common species. Vines such as catbrier (*Smilax glauca*), Virginia creeper (*Parthenocissus quinquefolia*) and muscadine (*Vitis rotundifolia*) were also frequent.

This is a very dry ridge type of forest that is characterized by a strong dominance by chestnut oak along with other dry site oaks such as scarlet oak and sand hickory.

### **Interior Low Plateau Chestnut Oak - Mixed Oak Forest**

Identifier: CEGLO07700

This is a widespread association for the western slopes of Lookout Mountain and sites range from somewhat xeric to dry-mesic. The geologic substrates vary from Pennsylvanian sandstone on the upper slopes to Mississippian shale and limestone in mid slope positions. Elevations vary from 900 – 1350 feet.

On Lookout Mountain these stands were dominated by chestnut oak (*Quercus prinus*) and black oak (*Quercus velutina*) often in association with white oak (*Quercus alba*). Other prominent canopy species included northern red oak (*Quercus rubra*), red hickory (*Carya ovalis*), pignut hickory (*Carya glabra*) and occasionally sand hickory (*Carya pallida*). Scattered individuals of shortleaf pine (*Pinus echinata*) and Virginia pine (*Pinus virginiana*) were also sometimes present. Subcanopy and understory species frequently encountered included sourwood (*Oxydendrum arboreum*), red maple (*Acer rubrum*), mockernut hickory (*Carya alba*), black gum (*Nyssa sylvatica*), sassafras (*Sassafras albidum*) and flowering dogwood (*Cornus florida*). The shrub layer was generally sparse to patchy with deerberry (*Vaccinium stamineum*), lowbush blueberry (*Vaccinium pallidum*), sparkleberry (*Vaccinium arboreum*), mountain laurel (*Kalmia latifolia*), maple-leaved viburnum (*Viburnum acerifolium*), highbush blueberry (*Vaccinium corymbosum*) and St. Andrew's cross (*Hypericum hypericoides*) some of the most characteristic species. In most cases the herbaceous layer was also sparse, but in more mesic situations, such as concave midslopes, it could be moderately well developed and diverse. Typical species included deerhair grass (*Deschampsia flexuosa*), poverty grass (*Danthonia spicata*), little bluestem (*Schizachyrium scoparium*), goldenrod (*Solidago erecta*), flowering glade-spurge (*Euphorbia pubentissima*), black-edge sedge (*Carex nigromarginata*), tickseed sunflower (*Coreopsis major*), small-headed sunflower (*Helianthus microcephalus*), tall flat-topped aster (*Doellingeria umbellata*), Indian physic (*Porteranthus stipulatus*) and cranefly orchid (*Tipularia discolor*).

This is the most frequently occurring chestnut oak dominated forest and is widespread on Lookout Mountain.

### **Dry-Mesic Southern Appalachian White Oak - Hickory Forest**

Identifier: CEGLO07231

This forest type was documented only once at Moccasin Bend on a lower slope in a somewhat sheltered position at the base of the sandstone ridge that forms the spine of rock that is responsible for the large bend in the Tennessee River. Soils were very sandy and well drained.

The canopy of the example studied was dominated by a mixture of white oak and black oak (*Quercus velutina*) with hickory species including mockernut (*Carya alba*) and red hickory (*Carya ovalis*). It also contained a substantial amount of loblolly pine (*Pinus taeda*) and sweetgum (*Liquidambar styraciflua*).

Their presence probably reflects human disturbance in the distant past. Other oaks were present in the canopy including southern red oak (*Quercus falcata*), post oak (*Quercus stellata*) and scarlet oak (*Quercus coccinea*). The understory contained red maple and sourwood (*Oxydendrum arboreum*). The shrub layer was very open and included only hardwood species from the canopy or understory. The herbaceous layer was also sparsely developed with only a few species. Ebony spleenwort (*Asplenium platyneuron*), Christmas fern (*Polystichum acrostichoides*) and Virginia snakeroot (*Aristolochia serpentaria*) were the most frequent of these. Coverage by vine species including muscadine (*Vitis rotundifolia*), catbrier (*Smilax rotundifolia*), Virginia creeper (*Parthenocissus quinquefolia*) and poison ivy (*Toxicodendron radicans*) was very high.

The example here helps to document a poorly understood association that was previously described from the Tellico project.

### **Box-elder Floodplain Forest**

Identifier: CEGLO05033

This association was located at Moccasin Bend on the historic floodplain of the Tennessee River which has been altered by the deposition of fill dirt (clay) from construction activities. As such, this is a successional example of this forest type. The hydrologic regime now involves seasonal inundation by rain, primarily in the winter, on these poorly drained soils. The elevation is approximately 660 feet.

The canopy of this forest type was strongly dominated by box-elder (*Acer negundo*) along with lesser amounts of sugarberry (*Celtis laevigata*) and red maple (*Acer rubrum*). Subcanopy and shrub species identified included American elm (*Ulmus americana*), willow oak (*Quercus phellos*), water oak (*Quercus nigra*) and the non-native invasive Chinese privet (*Ligustrum sinense*). The herbaceous layer was also dominated by a non-native, Nepalese browntop (*Microstegium vimineum*). Other herbaceous species found here included false nettle (*Boehmeria cylindrica*), longbristle smartweed (*Polygonum caespitosum* var. *longisetum*), passion flower (*Passiflora incarnata*) and Poison ivy (*Toxicodendron radicans*).

### **Sycamore - Silver Maple Calcareous Floodplain Forest**

Identifier: CEGLO07334

These rich forests are temporarily flooded on a regular basis and were documented on the broad floodplain of Lookout Creek and the Tennessee River at Moccasin Bend. The alluvial deposits are nutrient rich, presumably from dolomites of the Knox Group and/or Mississippian limestone associated with Lookout Mountain. Elevations of sites are in the range of 660 feet.

The canopy of examples at Lookout Creek and Moccasin Bend are dominated by a mixture of silver maple (*Acer saccharinum*), box-elder (*Acer negundo*), sycamore (*Platanus occidentalis*) and green ash (*Fraxinus pennsylvanica*). Black walnut (*Juglans nigra*) and white ash (*Fraxinus americana*) are less frequent subcanopy members. The shrub layer is strongly dominated by a dense cover of spicebush (*Lindera benzoin*) but the non-native shrub, Chinese privet (*Ligustrum sinense*), is also abundant. Common elderberry (*Sambucus canadensis*) is also present at a low coverage. The herb layer is well developed and diverse with species indicative of high nutrient levels. This includes stinging nettle (*Laportea canadensis*), bulbous bittercress (*Cardamine bulbosa*), jumpseed (*Polygonum virginianum*), clustered snakeroot (*Sanicula odorata*), lane-leafed trillium (*Trillium lancifolium*) and wild onion (*Allium canadensis*). Other species found here are associated with frequently flooded sites such as green dragon (*Arisaema dracontium*), fish-on-a-string (*Chasmanthium latifolium*), Gray's sedge (*Carex grayii*), eastern narrowleaf sedge (*Carex amphibola*), false nettle (*Boehmeria cylindrica*), butterwort (*Packera glabella*),

yellow jewel weed (*Impatiens capensis*) and cutleaf coneflower (*Rudbeckia laciniata*). Vines are also prominent including Virginia creeper and poison ivy.

### **Rich Levee Mixed Hardwood Bottomland Forest**

Identifier: CEGLO08429

The best example at Chickamauga-Chattanooga National Military Park is a somewhat atypical occurrence located along Chandler Hollow Creek near the south central portion of Chickamauga Battlefield. This area consists of a very broad floodplain that appears to undergo fairly regular inundation. Many large specimen trees are located here. The occurrence is unusual in that it includes scattered individuals of overcup oak (*Quercus lyrata*), a species typically of the Coastal Plain. The elevation is 720 feet.

The example here was strongly dominated by sycamore (*Platanus occidentalis*), sugarberry (*Celtis laevigata*) and green ash (*Fraxinus pennsylvanica*) along with lesser amounts of slippery elm (*Ulmus rubra*) and some overcup oak. Box-elder (*Acer negundo*) and ironwood (*Carpinus caroliniana*) dominated the understory. The shrub layer included paw-paw (*Asimina triloba*), spicebush (*Lindera benzoin*) and river cane (*Arundinaria gigantea*). Chinese privet (*Ligustrum sinense*) occurred in shattered patches. The herb layer was well developed and largely dominated by species adapted to frequent flooding as well as rich substrates. Virginia wild rye (*Elymus virginicus*), false nettle (*Boehmeria cylindrica*), fish-on-a-string (*Chasmanthium latifolium*), Cherokee sedge (*Carex cherokeensis*), common blue violet (*Viola sororia*), Gray's sedge (*Carex grayii*), and leafy bulrush (*Scirpus polyphyllus*) were the most frequent species documented.

### **Southern Interior Oak Bottomland Forest**

Identifier: CEGLO08487

This association was documented only one time in junction with work with the photointerpreters on the floodplains of Lookout Creek. This site undergoes regular seasonal temporary flooding and has the aspect of a generally rich alluvial forest. The documentation of this forest at Lookout Mountain represents a slight range extension of this forest type north from occurrences in the southern Ridge and Valley.

The canopy is strongly dominated by Shumard oak (*Quercus shumardii*) along with southern shagbark hickory (*Carya carolinae-septentrionalis*), water oak (*Quercus nigra*), sweetgum (*Liquidambar styraciflua*), white oak and tulip poplar. The understory and shrub layer tends to be open in character with sparse hop hornbeam (*Ostrya virginiana*), ironwood (*Carpinus caroliniana*) and spicebush (*Lindera benzoin*). The herb layer is moderately well developed including species such as river oats (*Chasmanthium latifolium*), Canada snakeroot (*Sanicula canadensis*), meadow parsnip (*Thaspium* sp.) and sedges (*Carex* sp.). Vines are conspicuous, especially catbrier (*Smilax rotundifolia*) and trumpet vine (*Campsis radicans*).

### **Cumberland Plateau Willow Oak Pond**

Identifier: CEGLO08841

This is a rare forest type associated with natural subsidence ponds of either sandstone or limestone. A good example of this plant community was located in association with a sizable depression at Chickamauga Battlefield northeast of Alexander Bridge away from the floodplain of West Chickamauga Creek. This pond (about 20 m in diameter) is flooded from seasonal rainfall, and has well developed mucky soils that typically become dry during the latter part of the growing season. Water depth at

maximum is about 100 cm, and there are three distinct zones of vegetation: a sparse open canopy of hardwoods, an equally open sparse shrub layer, and a patchy herbaceous layer of tall sedges within the pond margins.

At the margin of the pond, there is an open canopy dominated by large willow oak (*Quercus phellos*) along with loblolly pine and sweetgum. Green ash (*Fraxinus pennsylvanica*) and red maple (*Acer rubrum*) occur sparsely in the subcanopy. The shrub layer is also very sparse consisting of scattered winged sumac (*Rhus copallinum*) and red maple. The herbaceous layer is patchy with tall graminoids such as hop sedge (*Carex lupulina*), greater bladder sedge (*Carex intumescens*), cattail sedge (*Carex typhina*) and southern waxy sedge (*Carex glaucescens*) dominant. Other wetland herbs found here include false nettle (*Boehmeria cylindrica*) and marsh seedbox (*Ludwigia palustris*).

Other limesink ponds are reported for Chickamauga Battlefield (The Georgia Conservancy, 1990) and a smaller example was documented as part of the initial sampling protocol (CHCH.03). These are significantly rare plant associations (G3) and should be inventoried, mapped and monitored for ecological integrity. These sites are frequently important breeding habitats for various species of amphibians.

### **Highland Rim Semi-natural Red-cedar - Oak Forest**

Identifier: CEGLO04731

This association occurred on the side of a low calcareous ridge (limestones of the Chickamauga Group) in the central portion of Chickamauga Battlefield. This was a xeric to dry-mesic site, shallow to rock with a southwest exposure. It is probably the result of disturbance from land clearing activities in the past. The elevation was 740 feet.

This example here was strongly dominated by Eastern red-cedar with lesser amounts of other tree species such as black cherry (*Prunus serotina*), southern shagbark hickory (*Carya carolinae-septentrionalis*), blackjack oak (*Quercus marilandica*), southern red oak (*Quercus falcata*), red maple, flowering dogwood (*Cornus florida*), and redbud (*Cercis canadensis*). The shrub layer was sparse to patchy and dominated by Carolina buckthorn (*Frangula caroliniana*) and fragrant sumac (*Rhus aromatica*). The herbaceous layer was patchy to moderately well developed and fairly diverse. Cherokee sedge (*Carex cherokeensis*), nettle-leaved salvia (*Salvia urticifolia*), agave (*Manfreda virginica*), elephant's foot (*Elephantopus tomentosus*) and wild petunia (*Ruellia caroliniensis*) were some of the most prominent species.

### **Southern Blue Ridge Escarpment Shortleaf Pine - Oak Forest**

Identifier: CEGLO07493

This is a xeric, mixed evergreen pine and deciduous hardwood forest that was located on the western side of Chickamauga Battlefield on the small section of sandstone cap that covers this section of the park. These slopes had a western aspect and were judged to xeric with thin, well drained cherty soils. Elevations ranged from about 980 - 1000 feet.

This association had a mixed canopy of evergreen and deciduous species with nearly equal amounts of shortleaf pine (*Pinus echinata*), black oak (*Quercus velutina*) and southern red oak (*Quercus falcata*). Subcanopy and understory species present include sourwood (*Oxydendrum arboreum*), flowering dogwood, blackjack oak (*Quercus marilandica*), post oak (*Quercus stellata*), pignut hickory (*Carya glabra*) and black gum (*Nyssa sylvatica*). The shrub layer is mostly dominated by transgressive hardwoods from the canopy layer but also included lowbush blueberry (*Vaccinium pallidum*), Carolina

buckthorn (*Frangula caroliniana*) and sassafras. The herbaceous layers is very sparse (less than five percent of groundcover). Frequently occurring species here are tickseed sunflower (*Coreopsis major*), black-edge sedge (*Carex nigromarginata*), sessile bellwort (*Uvularia sessilifolia*), naked tick-trefoil (*Desmodium nudiflorum*), flowering spurge (*Euphorbia pubentissima*), Virginia snakeroot (*Aristolochia serpentaria*), fragrant goldenrod (*Solidago odora*) and bedstraw. Muscadine and catbrier are common vines.

### **Cultivated Meadow**

Identifier: CEG004048

These are the widespread open cultivated grasslands that are maintained throughout Chickamauga Battlefield and are an important part of the historic component of the site. Some of these have a fairly high percentage of native species but do not approach the condition of more natural grasslands such as found in the Southern Ridge and Valley Patch Prairie Ecological System. These areas are actively mowed and some are used for the production of hay.

These are primarily dominated by meadow fescue (*Lolium pratense*) but also include a wide variety of non-native and native species, some of these perhaps relicts of original more widespread glade type vegetation. Other native grass and herbaceous species found here include purpletop (*Tridens flavus*), longspike tridens (*Tridens strictus*), beaked panicgrass (*Panicum anceps*), Florida paspalum (*Paspalum floridanum*), bottlebrush grass (*Setaria parviflora*), eastern gamagrass (*Tripsacum dactyloides*), smooth paspalum (*Paspalum laeve*), fringleaf wild petunia (*Ruellia humilis*), green milkweed [*Asclepias hirtellus* (uncommon glade species)], lyre-leaved sage (*Salvia lyrata*) and orange coneflower (*Rudbeckia fulgida*). Typical non-native species commonly found here include Johnson grass [*Sorghum halepense* (widespread)], dallas grass (*Paspalum dilatatum*), crabgrass (*Digitaria sanguinalis*), ox-eye daisy (*Leucanthemum vulgare*) and wild carrot (*Daucus carota*).

### **Piedmont/Mountain Semipermanent Impoundment (Montane Boggy Type)**

Identifier: CEG004510

The example studied at Chickamauga Battlefield was associated with a small, natural depression pond (Cumberland Plateau Willow Oak Pond) with distinct zonal vegetation related to water depth and hydrology. The American bur-reed (*Sparganium americanum*) vegetation dominated the inner emergent herbaceous zone where seasonal flooding provides for saturated soils for almost all of the winter and most of the growing season. Soils are fine and mucky, presumably basic and the geologic substrate is presumed to be limestone. The elevation is 740 feet. These habitats may serve as important breeding sites for amphibians.

The American bur-reed occurred along with a mixture of other obligate herbaceous wetland species including hop sedge (*Carex lupulina*), cutgrass (*Leersia oryzoides*), swamp smartweed (*Polygonum hydropiperoides*), swamp rattlebox (*Ludwigia palustris*), false nettle (*Boehmeria cylindrica*), duckweed (*Potamogeton* sp.) and blunt spikerush (*Eleocharis obtusa*).

This is a rare association and restricted to natural depression ponds that are extremely infrequent on the general landscape.

### **Limestone Seep Glade**

Identifier: CEG004169

This community is a small patch association that occurs within the glades at Chickamauga Battlefield in areas where seepages are located, often in areas where the limestone is fractured. It is rare on the landscape compared to other glade type vegetation.

The species that are associated with these seeps are uncommon and narrowly distributed. Flat-stemmed spikerush (*Eleocharis compressa*) is a conspicuous dominant and occurs along with crow-poison (*Nothoscordum bivalve*), Craw's sedge (*Carex crawei*) and nodding onion (*Allium cernuum*). Tennessee gladecress (*Leavenworthia exigua* var. *exigua*) is an associate in some examples. This species is listed as Threatened by the Georgia Natural Heritage Program.

### **Central Limestone Glade**

Identifier: CEG005131

This association is without question the most biologically significant feature of Chickamauga Battlefield. It occurs as a matrix within a forest/woodland complex where exposures of limestone are located at the surface with only a few scattered and dwarfed trees or shrubs. These sites are very wet during periods of heavy rainfall in the winter and are extremely dry during the hottest part of the growing season (especially during periods of drought). Microhabitats occur as a result of amount of exposure to sun, the shape and amount of exposure of bedrock, and also the degree of fragmentation of the limestone and depth of soil. The vegetation is primarily dominated by grass species but includes a large number of special concern plant species tracked by the Georgia Natural Heritage Program.

These glades tend to be very heterogeneous depending upon the degree of exposure of the limestone and amount of soil development. Almost all include stunted, patchy Eastern red-cedar (*Juniperus virginiana* var. *virginiana*) along with scattered small white ash (*Fraxinus americana*), persimmon (*Diospyros virginiana*), Shumard oak (*Quercus shumardii*), chinquapin oak (*Quercus muehlenbergii*), hackberry (*Celtis occidentalis*) and redbud (*Cercis canadensis*). A sparse low shrub layer is also usually patchy in nature. This may include buckthorn bully (*Sideroxylon lycioides*), winged elm (*Ulmus alata*), fragrant sumac (*Rhus aromatica*), Carolina buckthorn (*Frangula caroliniana*) and coral berry (*Symphoricarpos orbiculatus*). Herbaceous cover is varied with some sites reaching ninety percent cover by grasses and herbaceous species and others less than fifty percent. All sites include some amount of bare limestone, however this may have a thin cover of lichen, moss or algae. The dominant grass for many glades is little bluestem (*Schizachyrium scoparium*) but a great number of other grass and herbaceous species are usually present. Typical grass species may include sideoats grama (*Bouteloua curtipendula*), big bluestem (*Andropogon gerardii*), poverty dropseed (*Sporobolus vaginiflorus*), rough dropseed (*Sporobolus clandestinus*), Indian grass (*Sorghastrum nutans*) and in one example prairie dropseed (*Sporobolus heterolepis*).

Many of the herbaceous forb species found here are endemic to the glade environment or have affinities to prairie systems. Examples of these are prairie coneflower (*Ratibida pinnata*), straggling St. Johnswort (*Hypericum dolabriforme*), prairie tea (*Croton monanthogynus*), small skullcap (*Scutellaria parvula*), Great Plains ladies-tresses (*Spiranthes magnicamporum*), false pennyroyal (*Isanthus brachiatus*), Tennessee gladecress (*Leavenworthia exigua* var. *exigua*), Nashville breadroot (*Pedimelum subacaule*), grooved flax (*Linum sulcatum*), balsam groundsel (*Packera paupercula*), green antelopehorn (*Asclepias viridis*), Craw's sedge (*Carex crawei*), Gattinger's prairie clover (*Dalea gattingeri*), fringeleaf wild petunia (*Ruellia humilis*), southern prairie aster (*Eurybia hemisphaerica*), limestone adders tongue

(*Ophioglossum engelmannii*), glade violet (*Viola egglesonii*) and southern prairie-dock (*Silphium pinnatifidum*).

Other characteristic species found in these glades includes obedient plant (*Physostegia virginiana*), palespike lobelia (*Lobelia spicata*), hoary puccoon (*Lithospermum canescens*), whorled milkweed (*Asclepias verticillata*), Canadian summer bluet (*Houstonia canadensis*), narrow-leaved bluet (*Houstonia longifolia*), agave (*Manfreda virginica*), Maryland wild senna (*Senna marilandica*), narrowleaf whitetop aster (*Sericocarpus linifolius*) and lyre-leaved sage (*Salvia lyrata*). This association bears a close affinity to cedar glades known from the Central Basin of Tennessee.

It is generally recognized that fire is an important component of managing glade complexes, in particular to prevent encroachment of woody species into the open glade environment. Much of the surrounding woodlands within the glade complex appear to have characteristics of fire suppression. A program to begin introducing fire into these systems is recommended for Chickamauga Battlefield. A second management concern is the encroachment into the glades of non-native invasive species. Several glades appear to have developed substantial amounts of Chinese privet (*Ligustrum sinense*). This would appear to be a significant threat to the natural integrity of these natural areas and requires attention.

### **Smartweed - Cutgrass Beaver Pond**

Identifier: CEG004290

This association occurs as a component of a small natural limesink depression pond at Chickamauga Battlefield. This site is filled by winter rains and most probably becomes dry during the end of the hottest part of the growing season. There is a well developed emergent herbaceous zone and mucky soils stay saturated for most of the year.

The example studied occurs as a dense zone of emergent herbaceous plants dominated by a combination of dotted smartweed (*Polygonum punctatum*), swamp smartweed (*Polygonum hydropiperoides*) and rice cutgrass (*Leersia oryzoides*). Other species located within this zone includes false nettle (*Boehmeria cylindrica*), American bur-reed (*Sparganium americanum*), blunt spikerush (*Eleocharis obtusa*) and marsh rattlebox (*Ludwigia palustris*).

This is a naturally infrequent community type and apparently restricted at Chickamauga Battlefield to limestone depression ponds.

### **Southern Ridge and Valley Annual Grass Glade**

Identifier: CEG004339

This association occurs in small patches within the glade complex where soils are extremely shallow. The groundcover layer is dominated by annual grass species, particularly dropseed (*Sporobolus vaginiflorus*). Some other species which are present include whorled milkweed (*Asclepias verticillata*), Hogwarts (*Croton capitatus*), prairie tea (*Croton monanthogynus*), slender heliotrope (*Heliotropium tenellum*), straggling St. Johnswort (*Hypericum dolabriforme*), glade blue-curls (*Isanthus brachiatus*), agave (*Manfreda virginica*) and trailing ruellia (*Ruellia humilis*).

This is a rare (G2,G3) community and closely related to similar annual grass dominated vegetation from limestone glades in the Nashville Basin of Tennessee. It shares the same threats in regard to invasive species as the glade complex as a whole but is better able to resist non-native woody species because of

the extreme shallow soils. It is an infrequently occurring plant habitat at Chickamauga and Chattanooga National Military Park.

#### **Cumberland Plateau Sandstone Cliff (Dry Type)**

Identifier: CEGLO04392

This community is restricted to the sandstone cliffs that occur on top of Lookout Mountain where the expansive exposures of rock are also a scenic feature. The association here is properly referred to as “sparse vegetation” and vascular plants cover probably less than five percent of the rocky cliffs. Non-vascular plants such as lichens and mosses may cover more surface area than vascular plants and impacts from rock climbing on these species has been of management concern.

At Lookout Mountain this vegetation is very patchy with widely scattered small trees and shrubs and sparse herbaceous cover where crevices provide few sites for rooting. Commonly found species in this environment include Virginia pine (*Pinus virginiana*), red maple, mountain laurel, St. Andrew’s cross (*Hypericum stragulum*), deerhair grass (*Deschampsia flexuosa*), Adam's needle (*Yucca filamentosa*), little bluestem (*Schizachyrium scoparium*), marginal wood fern (*Dryopteris marginalis*), hay-scented fern (*Dennstaedtia punctilobula*), mountain spleenwort (*Asplenium montanum*) and Blue Ridge Sedge (*Carex lucorum* var. *australucorum*). Herbaceous cover may only reach two percent, with lichen cover sometimes approaching thirty percent cover.

#### **Appalachian Talus Slope**

Identifier: CEGLO04454

Perhaps a rare association for the park and only documented once at Lookout Mountain where it occurred at the base of the sandstone cliffs along the west side of the mountain.

Like the sandstone cliff association, rocky substrates make up the majority (sixty percent) of the habitat of this community and it is also considered sparse vegetation. The example studied was strongly dominated by a mixture of Virginia creeper (*Parthenocissus quinquefolia*), poison ivy (*Toxicodendron radicans*) and summer grape (*Vitis aestivalis*). Other notable species found here included marginal wood fern (*Dryopteris marginalis*), walking fern (*Asplenium rhizophyllum*), ovate-leaved skullcap (*Scutellaria ovata*), white wood aster (*Eurybia divaricata*), and Curtis’s goldenrod (*Solidago curtisii*).

This association is believed to be rare throughout its range (G2G3?) but is poorly documented. This occurrence at Chickamauga and Chattanooga National Military Park provides valuable additional information on this plant community.

### **Ecological Community Summary and Management Considerations**

Of the 33 associations described above, 25 associations are considered natural or not modified extensively by human activities. These 25 associations occur in areas that have not been disturbed for more than 70 years or occur in bottomland areas that recover more quickly from stand initiating disturbance. They account for most of the park's acreage. When considering priorities for land management, exotic invasive control, preservation, etc., these communities should take higher priority than the successional and exotic-dominated communities.

Of all the natural communities present, the most globally rare communities in the park are five of those associated with the limestone glade and woodland complex. This includes the Central Limestone Glade (G2G3), Southern Ridge and Valley Annual Grass Glade (G2G3), Limestone Seep Glade (G2?), Interior Plateau Chinquapin Oak - Shumard Oak Forest (G3) and Interior Low Plateau Chinquapin Oak - Mixed Oak Forest (G3). These glades and woodlands are restricted to unusual geologic conditions (outcrops and shallow to rock limestone valleys) and are known only sporadically from the Nashville Basin in central Tennessee, the Moulton Valley in northern Alabama and widely scattered in central Kentucky. These infrequently occurring associations with their complementary suit of rare glade endemics are worthy of special management consideration.

Based upon simple observation, the encroachment of non-native and aggressive native species into the glades would appear to be the number one threat to the natural integrity and ecological functioning of these plant associations. Chinese privet (*Ligustrum sinense*) and eastern red-cedar were observed in many sites and seem to be the two most aggressive woody species threatening some glades in the park. It is assumed that under natural conditions these woodlands would occasionally burn on a regular fire return interval thus maintaining the characteristic open woodland structure. Since the establishment of this site as a National Military Park, these areas have been protected from wildfires (as most public lands have been) and have most likely become fire suppressed. Only the areas with the shallowest soils have remained open at all. The dense low evergreen shrub/understory layer of eastern red-cedar reduces the development of grass and forb species within the woodland and likely facilitates encroachment of cedars into the glades themselves. Management activities should be directed at removing privet and reintroducing fire to the woodlands that surround these glades, in our opinion.

Transects were established within nine selected glades by the Nature Conservancy in 1994 (Sutter et al) to establish baseline monitoring data. These plots are to be re-sampled during the 2006 and 2007 growing season by NatureServe. Data collected and analyzed from this effort will greatly inform management decisions necessary to ensure the viability of these plant communities and may help the park better determine how much of a threat the encroachment of woody species is in the glades.

Another highly ranked community that may warrant special attention would be the Cumberland Plateau Willow Oak Pond (G3). This association was only documented at two sample points (CHCH.03 and CHCH.52) but is reported for other locations (Bloody Pond) at Chickamauga Battlefield by Wharton (1990). These are naturally rare associations on the landscape and serve as breeding site for amphibians, a water source for wildlife species and contribution to the overall landscape diversity. Oak ponds of this kind are sometimes ditched and drained, and other times deepened to provide a more reliable water source. Additional examples should be located, mapped and monitored to ensure that no unintended impacts occur to them.

Although most of the significantly rare plant associations occur at Chickamauga Battlefield, Lookout Mountain also has important natural forest habitat and a diversity of plant communities. This includes

extensive examples of Interior Low Plateau Chestnut Oak - Mixed Oak Forest and Cumberland Plateau Dry-Mesic White Oak Forest as well as small examples of Appalachian Talus Slope. The floodplains of Lookout Creek have outstanding examples of Sycamore - Silver Maple Calcareous Floodplain Forest and Southern Interior Oak Bottomland Forest. These are generally in good condition but lower elevation examples, particularly in the vicinity of Lookout Creek have areas with serious impacts from non-native species, especially Japanese honeysuckle.

Two other management units were examined during this inventory: Sherman Reservation and Moccasin Bend. Both are heavily influenced by their proximity to urban areas and show extensive human impacts. Only small areas with natural integrity occur here and non-native invasive species often dominate. The exception is the upper slopes of the sandstone ridge that occurs on the east side of Moccasin Bend. This area supports a mature and fairly intact example of a Dry-Mesic Southern Appalachian White Oak - Hickory Forest.

Chickamauga and Chattanooga National Military Park's natural resources are a great asset to the park system, few sites have as many significant plant associations as the limestone woodland/glade complex at Chickamauga Battlefield. Some of the recommendations for this park in terms of sustaining and promoting increased plant biodiversity include:

- 1) Control invasive exotics in all communities, but especially those in and near the limestone glade and woodland complex. These areas have very high biodiversity and a large number of rare or infrequent glade endemics. These areas are also susceptible to invasion by a number of invasive exotics, especially privet and Japanese honeysuckle and invasion of aggressive natives such as eastern red-cedar.
- 2) Attempt to re-introduce fire to manage the Interior Plateau Chinquapin Oak - Shumard Oak Forest and the Interior Low Plateau Chinquapin Oak - Mixed Oak Forest. The open canopy produced by a regular fire regime allows for greater light in the understory and thereby promotes a higher cover of native herbaceous plant species and regeneration of oak species. Fire may also decrease the density of the evergreen eastern red-cedar component which appears to be encroaching into the glades and shading out herbaceous species.
- 3) Continue to protect high quality versions of all natural communities within the park. Although some natural communities in the park are globally common, there are few high quality protected versions of these forests in the Ridge and Valley/ Southern Cumberland region.
- 4) Attempt to locate, map and monitor all examples of the Cumberland Plateau Willow Oak Pond to ensure that no unintended impacts occur.

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**Figure 1: Overall map of plot locations at Chickamauga and Chattanooga Military Park with all management units having plots shown: Chickamauga Battlefield (lower right), Lookout Mountain (center left), Moccasin Bend (upper left) and Sherman Reservation (upper right).**

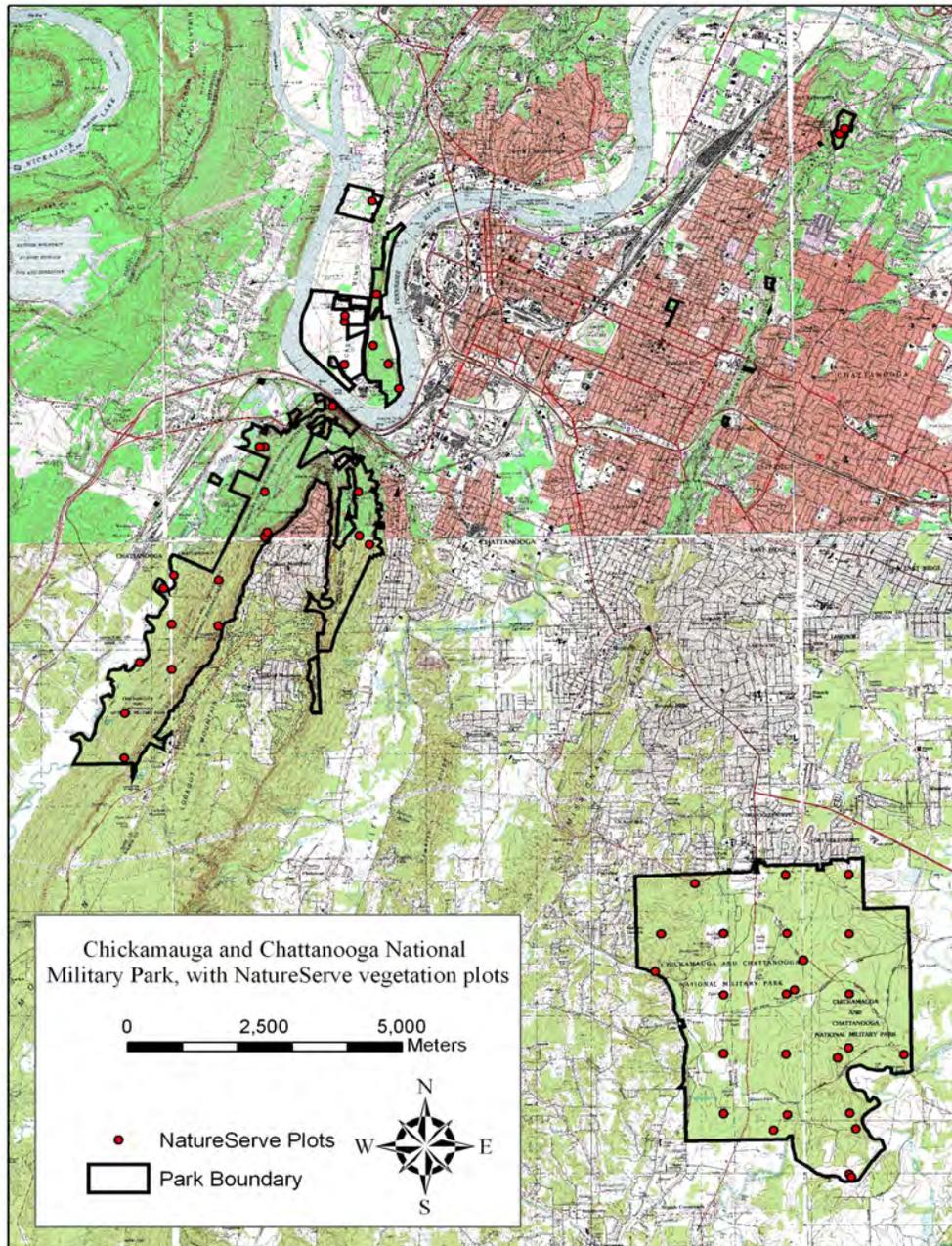


Figure 2: Plot locations and numbers for Chickamauga Battlefield.

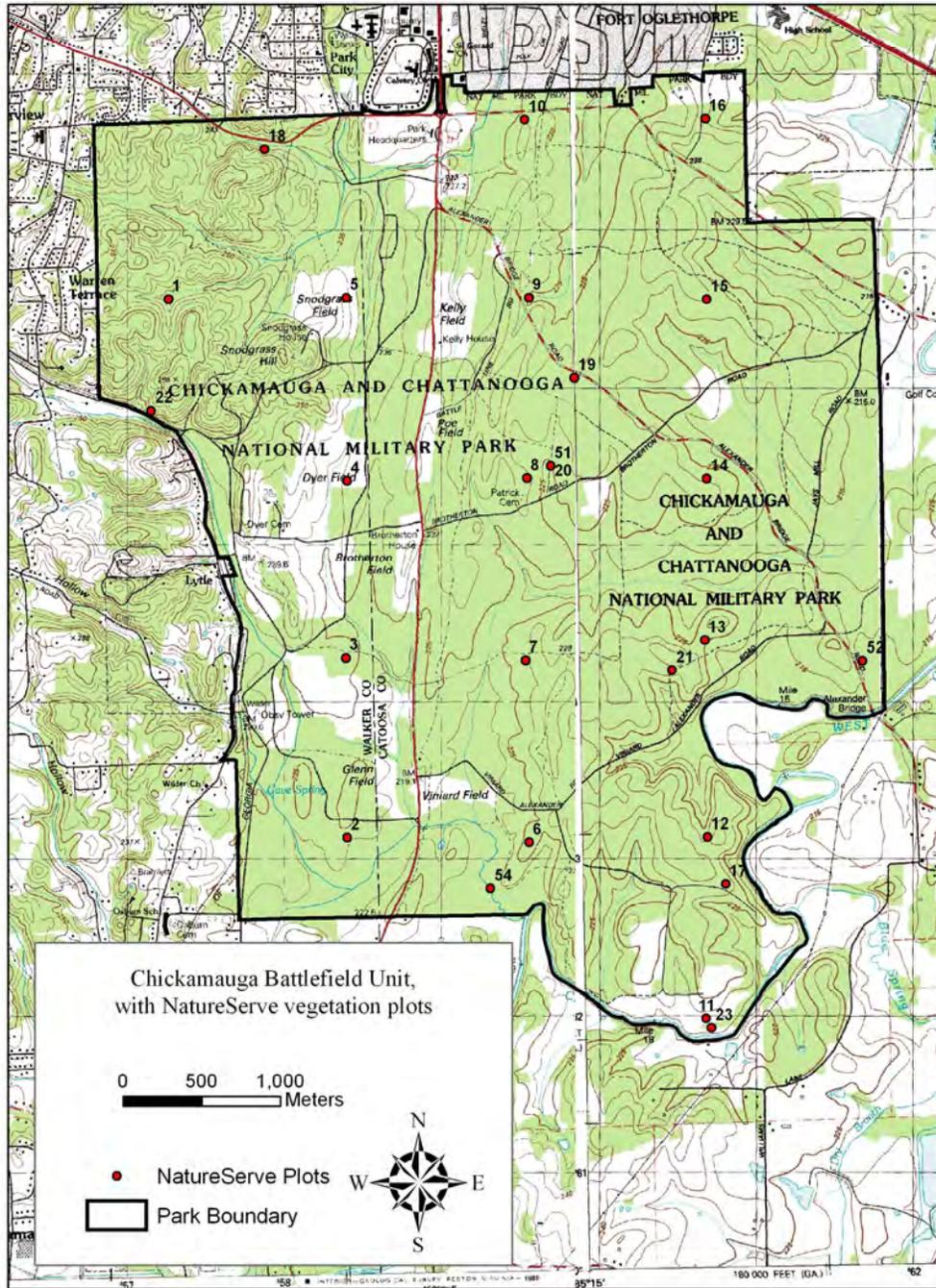


Figure 3: Plot locations and numbers for Lookout Mountain

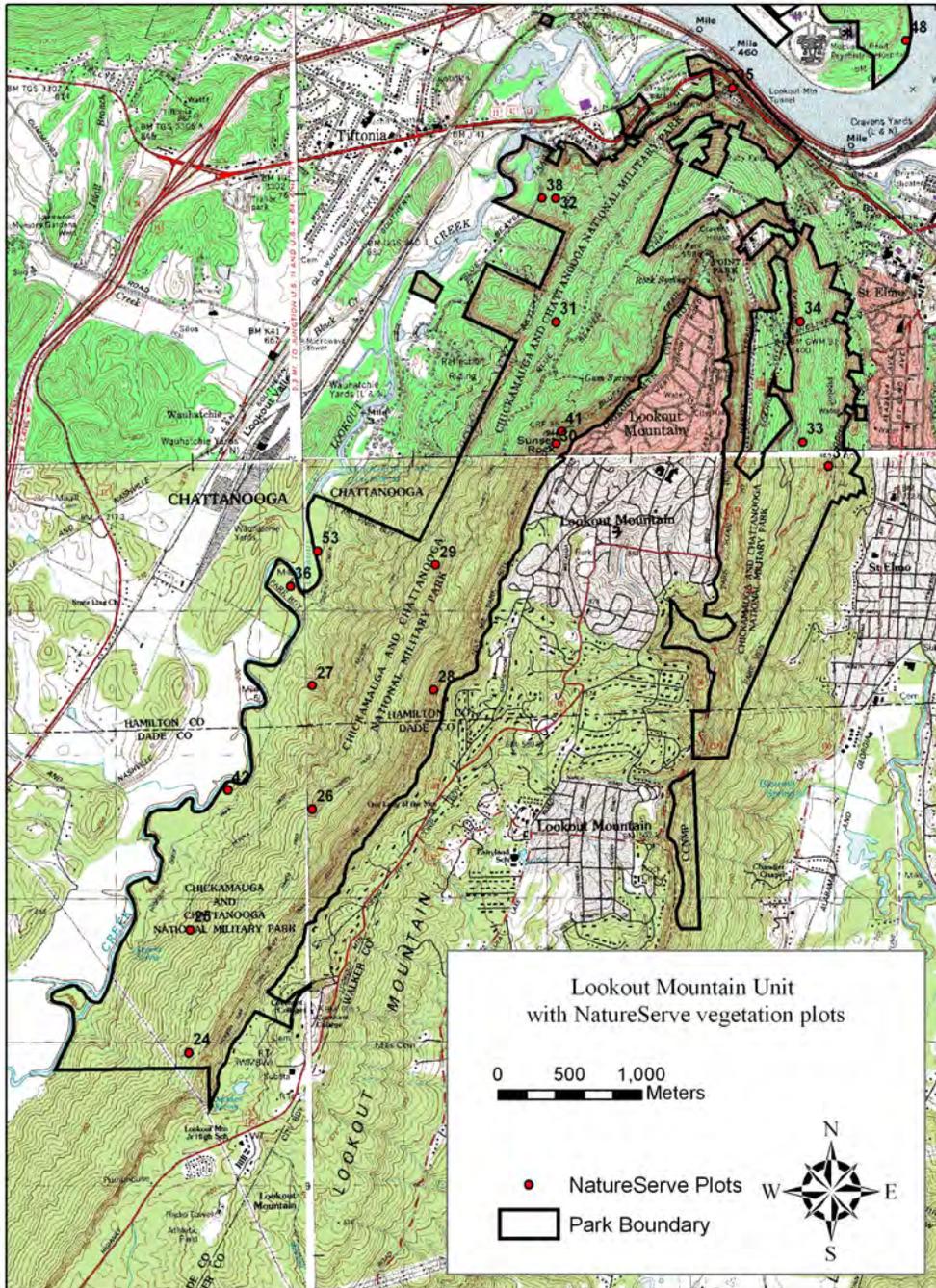


Figure 4: Plot locations and numbers for Moccasin Bend.

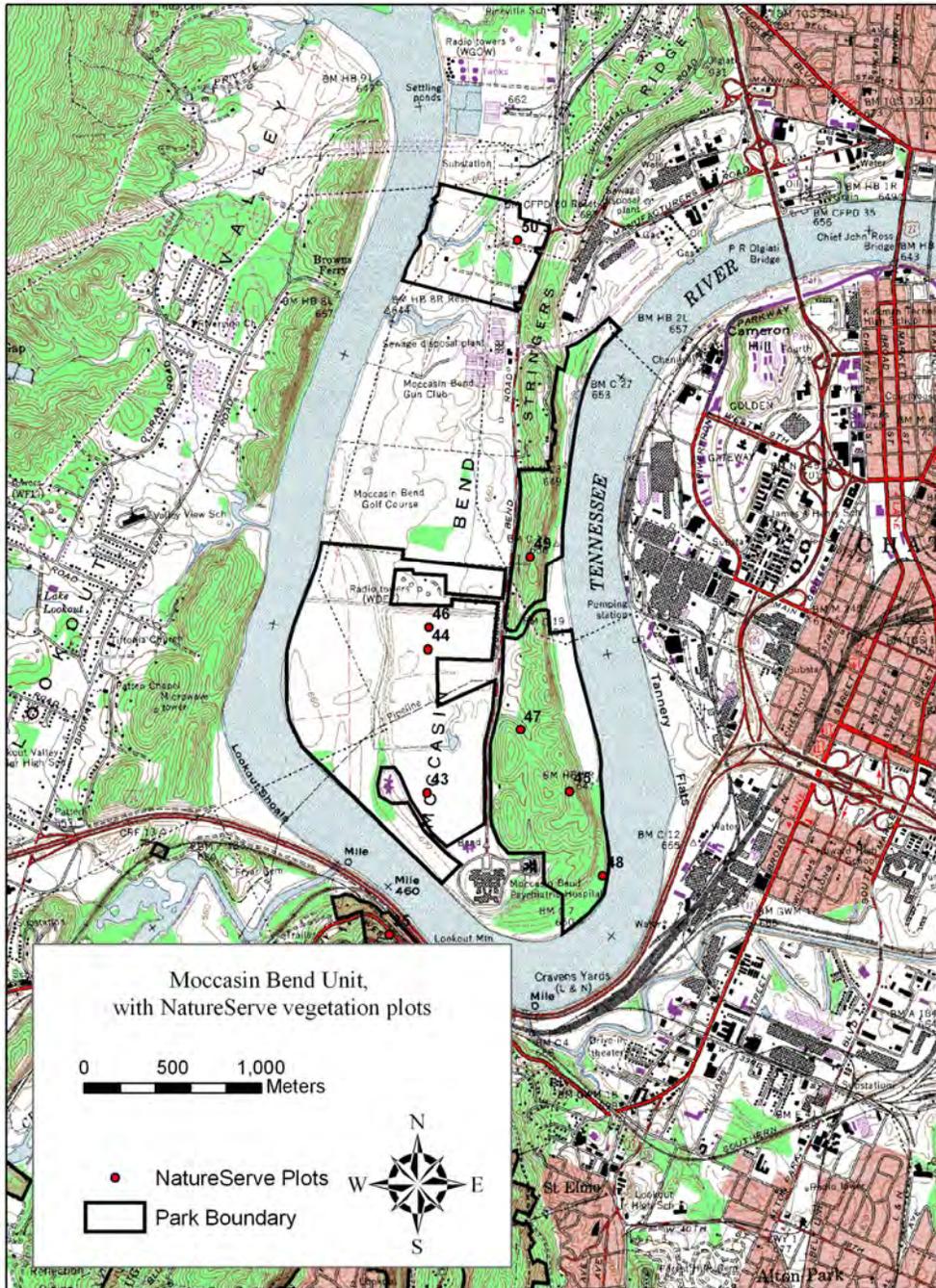
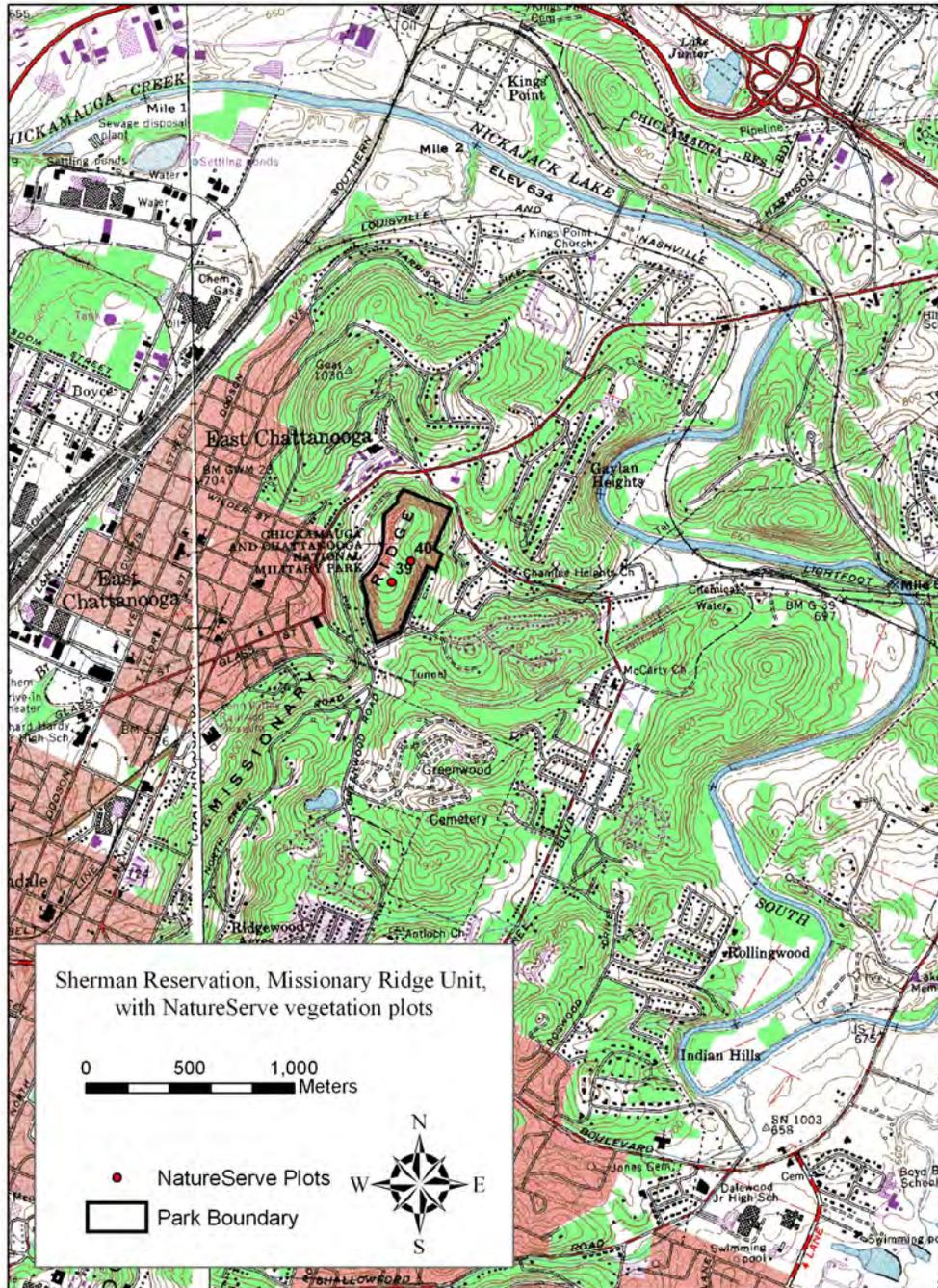
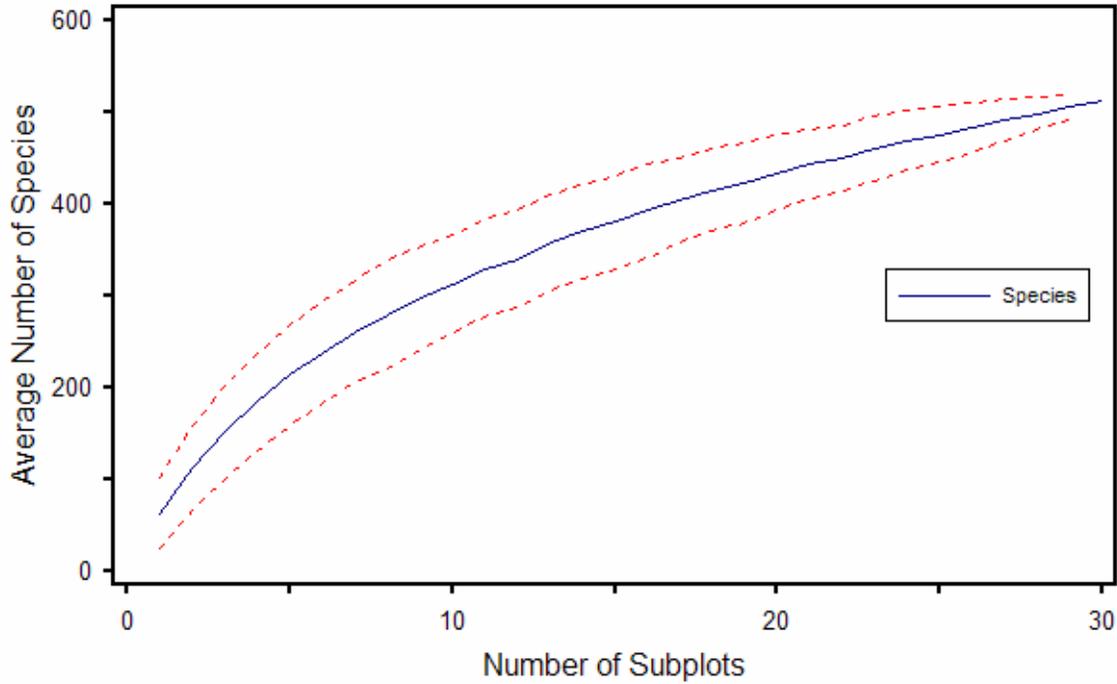


Figure 5: Plot locations and numbers for Sherman Reservation, Missionary Ridge.

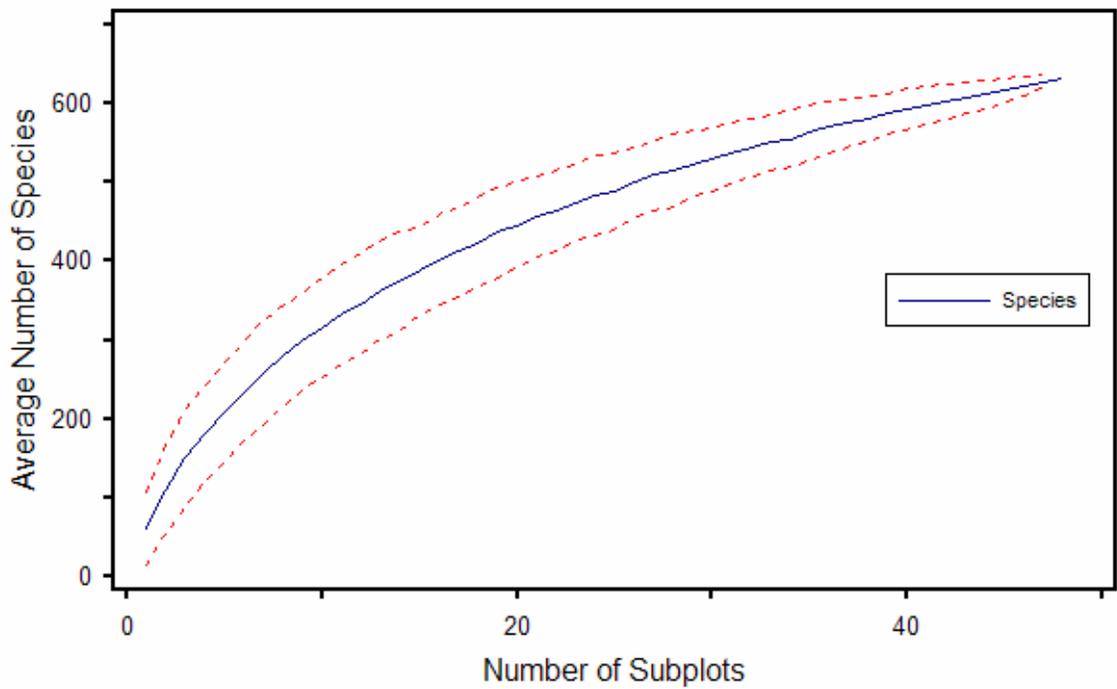


**Figure 6. Species area curves for Chickamauga and Chattanooga National Military Park using data from: a) only the 30 gridded plots; and: b) all 49 full plots.**

a)



b)



**Table 1. Plot numbers and locations for all permanent plots established at Chickamauga and Chattanooga National Military Park**

<b>Plot Number</b>	<b>X Coordinate</b>	<b>Y Coordinate</b>	<b>Projection</b>	<b>Zone</b>	<b>Type of plot</b>
1	657265	3866765	NAD83	16	FULL
2	658402	3863340	NAD83	16	FULL
3	658395	3864484	NAD83	16	FULL
4	658402	3865608	NAD83	16	FULL
5	658396	3866774	NAD83	16	FULL
6	659561	3863311	NAD83	16	FULL
7	659536	3864469	NAD83	16	FULL
8	659545	3865626	NAD83	16	FULL
9	659557	3866774	NAD83	16	FULL
10	659532	3867909	NAD83	16	FULL
11	660687	3862188	NAD83	16	FULL
12	660694	3863344	NAD83	16	FULL
13	660676	3864593	NAD83	16	FULL
14	660689	3865623	NAD83	16	FULL
15	660690	3866763	NAD83	16	FULL
16	660680	3867916	NAD83	16	FULL
17	660810	3863042	NAD83	16	FULL
18	657877	3867721	NAD83	16	FULL
19	659847	3866269	NAD83	16	FULL
20	659697	3865703	NAD83	16	FULL
21	660469	3864406	NAD83	16	FULL
22	657156	3866056	NAD83	16	FULL
23	660720	3862128	NAD83	16	FULL
24	647509	3870128	NAD83	16	FULL
25	647517	3870976	NAD83	16	FULL

**Table 1. Plot numbers and locations for all permanent plots established at Chickamauga and Chattanooga National Military Park (cont.)**

<b>Plot Number</b>	<b>X Coordinate</b>	<b>Y Coordinate</b>	<b>Projection</b>	<b>Zone</b>	<b>Type of plot</b>
26	648368	3871820	NAD83	16	FULL
27	648368	3872685	NAD83	16	FULL
28	649213	3872657	NAD83	16	FULL
29	649224	3873523	NAD83	16	FULL
30	650063	3874370	NAD83	16	FULL
31	650063	3875219	NAD83	16	FULL
32	650061	3876079	NAD83	16	FULL
33	651780	3874380	NAD83	16	FULL
34	651762	3875224	NAD83	16	FULL
35	651292	3876849	NAD83	16	FULL
36	648217	3873372	NAD83	16	FULL
37	651958	3874212	NAD83	16	FULL
38	649967	3876081	NAD83	16	FULL
39	660508	3882066	NAD83	16	FULL
40	660601	3882168	NAD83	16	FULL
41	650102	3874453	NAD83	16	Quickplot
42	647781	3871954	NAD83	16	Quickplot
43	651507	3877651	NAD83	16	FULL
44	651513	3878464	NAD83	16	FULL
45	652312	3877659	NAD83	16	FULL
46	651517	3878586	NAD83	16	FULL
47	652033	3878011	NAD83	16	FULL
48	652498	3877183	NAD83	16	FULL
49	652088	3878986	NAD83	16	FULL
50	652017	3880774	NAD83	16	FULL
51	659697	3865703	NAD83	16	FULL
52	661681	3864465	NAD83	16	Quickplot
53	648404	3873621	NAD83	16	Quickplot
54	659315	3863015	NAD83	16	Quickplot

**Table 2. List of all plants historically documented at Chickamauga and Chattanooga National Military Park.**

Scientific Name	Common Name	GRank	TSN	Data Source
<i>Acalypha gracilens</i>	slender threeseed mercury	G5	28183	NatureServe 2006
<i>Acalypha rhomboidea</i>	common threeseed mercury	G5	28193	NatureServe 2006
<i>Acalypha virginica</i>	Virginia threeseed mercury	G5	28195	Dickson & Nixon 1989
<i>Acer barbatum</i>	southern sugar maple	G4G5Q	28759	NatureServe 2006
<i>Acer negundo</i>	boxelder	G5	28749	Van Horn 1981
<i>Acer rubrum</i>	red maple	G5	28728	Van Horn 1981
<i>Acer saccharinum</i>	silver maple	G5	28757	NatureServe 2006
<i>Acer saccharum</i>	sugar maple	G5	28731	Van Horn 1981
<i>Achillea millefolium</i>	common yarrow	G5	35423	Van Horn 1981
<i>Actaea racemosa</i> var. <i>racemosa</i>	black bugbane	G4T4	18757	Van Horn 1981
<i>Adiantum pedatum</i>	northern maidenhair	G5	17311	Van Horn 1981
<i>Aesculus pavia</i>	red buckeye	G5	28723	NatureServe 2006
<i>Agalinis purpurea</i>	purple false foxglove	G5	33007	NatureServe 2006
<i>Agalinis setacea</i>	threadleaf false foxglove	G5?	33013	Van Horn 1981
<i>Agalinis tenuifolia</i>	slenderleaf false foxglove	G5	33036	Van Horn 1981
<i>Ageratina altissima</i> var. <i>altissima</i>	white snakeroot	G5T5	182398	Dickson & Nixon 1989
<i>Ageratina aromatica</i>	lesser snakeroot	G5	36467	Van Horn 1981
<i>Agrimonia gryposepala</i>	tall hairy agrimony	G5	25095	Van Horn 1981
<i>Agrimonia parviflora</i>	harvestlice	G5	25098	Van Horn 1981
<i>Agrimonia pubescens</i>	soft agrimony	G5	25099	NatureServe 2006
<i>Agrimonia rostellata</i>	beaked agrimony	G5	25100	Van Horn 1981
<i>Agrostis elliottiana</i>	Elliott's bentgrass	G5	40397	Van Horn 1981
<i>Agrostis perennans</i>	upland bentgrass	G5	40423	Dickson & Nixon 1989
<i>Ailanthus altissima</i>	tree of heaven	GNR	28827	Rogers 2000
<i>Albizia julibrissin</i>	silktree	GNR	26449	Van Horn 1981; Rogers 2000
<i>Alisma subcordatum</i>	American water plantain	G4G5	38895	NatureServe 2006
<i>Allium canadense</i>	meadow garlic	G5	42635	Van Horn 1981
<i>Allium cernuum</i>	nodding onion	G5	42721	Van Horn 1981
<i>Allium vineale</i>	wild garlic	GNR	42637	Van Horn 1981
<i>Amaranthus spinosus</i>	spiny amaranth	G5	20748	NatureServe 2006

**Table 2. List of all plants historically documented at Chickamauga and Chattanooga National Military Park.**

Scientific Name	Common Name	GRank	TSN	Data Source
<i>Ambrosia artemisiifolia</i>	annual ragweed	G5	36496	Van Horn 1981
<i>Ambrosia bidentata</i>	lanceleaf ragweed	G5	36500	Van Horn 1981
<i>Ambrosia trifida</i>	great ragweed	G5	36521	Van Horn 1981
<i>Amelanchier arborea</i>	common serviceberry	G5	25110	Van Horn 1981
<i>Amorpha fruticosa</i>	desert false indigo	G5	25368	Van Horn 1981
<i>Ampelopsis cordata</i>	heartleaf peppervine	G5	28633	NatureServe 2006
<i>Amphicarpaea bracteata</i>	American hogpeanut	G5	182067	Van Horn 1981
<i>Amsonia tabernaemontana</i>	eastern bluestar	G5	30148	Van Horn 1981
<i>Andropogon gerardii</i>	big bluestem	G5	40462	Van Horn 1981
<i>Andropogon gyrans</i>	Elliott's bluestem	G5	182527	NatureServe 2006
<i>Andropogon ternarius</i>	splitbeard bluestem	G5	40455	NatureServe 2006
<i>Andropogon virginicus</i>	broomsedge bluestem	G5	40456	Van Horn 1981
<i>Anemone quinquefolia</i>	wood anemone	G5	18448	Van Horn 1981
<i>Anemone virginiana</i>	tall thimbleweed	G5	18451	Van Horn 1981
<i>Angelica venenosa</i>	hairy angelica	G5	29453	Van Horn 1981
<i>Antennaria plantaginifolia</i>	woman's tobacco	G5	36717	Van Horn 1981
<i>Antennaria solitaria</i>	singlehead pussytoes	G5	36756	Dickson & Nixon 1989
<i>Anthoxanthum odoratum</i>	sweet vernalgrass	GNR	41395	NatureServe 2006
<i>Apocynum cannabinum</i>	Indianhemp	GNR	30157	NatureServe 2006
<i>Aquilegia canadensis</i>	red columbine	G5	18730	Van Horn 1981
<i>Arabidopsis thaliana</i>	mouseear cress	GNR	23041	Van Horn 1981
<i>Arabis canadensis</i>	sicklepod	G5	22678	Van Horn 1981
<i>Arabis laevigata</i>	smooth rockcress	G5	22706	Van Horn 1981
<i>Aralia spinosa</i>	devil's walkingstick	G5	29378	Van Horn 1981
<i>Arctium minus</i>	lesser burdock	GNR	36546	Van Horn 1981
<i>Arenaria serpyllifolia</i>	thymeleaf sandwort	GNR	20270	Van Horn 1981
<i>Arisaema dracontium</i>	green dragon	G5	42529	NatureServe 2006
<i>Arisaema triphyllum</i>	Jack in the pulpit	G5	42525	Van Horn 1981
<i>Aristida purpurascens</i>	arrowfeather threeawn	G5	41428	NatureServe 2006
<i>Aristolochia serpentaria</i>	Virginia snakeroot	G4	18342	NatureServe 2006
<i>Arnoglossum atriplicifolium</i>	pale Indian plantain	G4G5	36583	Van Horn 1981
<i>Arthraxon hispidus</i>	small carpgrass	GNR	41445	NatureServe 2006
<i>Aruncus dioicus</i>	bride's feathers	G5	25130	Van Horn 1981

**Table 2. List of all plants historically documented at Chickamauga and Chattanooga National Military Park.**

Scientific Name	Common Name	GRank	TSN	Data Source
<i>Arundinaria gigantea</i>	giant cane	G5	40477	Van Horn 1981
<i>Asclepias hirtella</i>	green milkweed	G5	30271	NatureServe 2006
<i>Asclepias quadrifolia</i>	fourleaf milkweed	G5	30297	Van Horn 1981
<i>Asclepias syriaca</i>	common milkweed	G5	30310	Van Horn 1981
<i>Asclepias tuberosa</i>	butterfly milkweed	G5?	30313	Van Horn 1981
<i>Asclepias variegata</i>	redring milkweed	G5	30319	Van Horn 1981
<i>Asclepias verticillata</i>	whorled milkweed	G5	30320	NatureServe 2006
<i>Asclepias viridiflora</i>	green comet milkweed	G5	30322	Van Horn 1981
<i>Asclepias viridis</i>	green antelopehorn	G4G5	30323	Sutter et al.
<i>Asimina triloba</i>	pawpaw	G5	18117	NatureServe 2006
<i>Asparagus officinalis</i>	garden asparagus	G5?	42784	Van Horn 1981
<i>Asplenium montanum</i>	mountain spleenwort	G5	17351	Van Horn 1981
<i>Asplenium platyneuron</i>	ebony spleenwort	G5	17355	Van Horn 1981
<i>Asplenium rhizophyllum</i>	walking fern	G5	17359	NatureServe 2006
<i>Astilbe biternata</i>	Appalachian false goat's beard	G4G5	24305	NatureServe 2006
<i>Astranthium integrifolium</i>	entireleaf western daisy	G5	193410	Sutter et al.; BONAP County Database
<i>Athyrium filix-femina</i> ssp. <i>asplenioides</i>	asplenium ladyfern	G5T5	17422	Van Horn 1981; Dickson & Nixon 1989
<i>Aureolaria laevigata</i>	entireleaf yellow false foxglove	G5	33486	Van Horn 1981
<i>Aureolaria virginica</i>	downy yellow false foxglove	G5	33490	Van Horn 1981
<i>Baptisia australis</i>	blue wild indigo	G5	26468	Sutter et al.; Van Horn 1981
<i>Barbarea verna</i>	early yellowrocket	GNR	22743	Van Horn 1981
<i>Barbarea vulgaris</i>	garden yellowrocket	GNR	22741	Van Horn 1981
<i>Berberis thunbergii</i>	Japanese barberry	GNR	18835	Van Horn 1981; Rogers 2000
<i>Berchemia scandens</i>	Alabama supplejack	G5	28447	Van Horn 1981
<i>Betula lenta</i>	sweet birch	G5	19487	Van Horn 1981
<i>Bidens aristosa</i>	bearded beggarticks	G5	35713	NatureServe 2006
<i>Bidens bipinnata</i>	Spanish needles	G5	500993	Van Horn 1981
<i>Bidens frondosa</i>	devil's beggartick	G5	35707	Dickson & Nixon 1989
<i>Bignonia capreolata</i>	crossvine	G5	34307	Van Horn 1981
<i>Boehmeria cylindrica</i>	smallspike false nettle	G5	19121	Van Horn 1981
<i>Botrychium biternatum</i>	sparselobe grapefern	G5	17175	NatureServe 2006
<i>Botrychium virginianum</i>	rattlesnake fern	G5	17173	Van Horn 1981

**Table 2. List of all plants historically documented at Chickamauga and Chattanooga National Military Park.**

Scientific Name	Common Name	GRank	TSN	Data Source
<i>Bouteloua curtipendula</i>	sideoats grama	G5	41500	Sutter et al.
<i>Brachyelytrum erectum</i>	bearded shorthusk	G5	41527	Van Horn 1981
<i>Brassica napus</i>	rape	GNR	23060	Van Horn 1981
<i>Bromus commutatus</i>	hairy brome	GNR	40497	Van Horn 1981
<i>Bromus pubescens</i>	hairy woodland brome	G5	40514	Van Horn 1981
<i>Buglossoides arvensis</i>	corn gromwell	GNR	501090	Van Horn 1981
<i>Buxus sempervirens</i>	common box	GNR	501097	Van Horn 1981
<i>Calamintha nepeta</i> ssp. <i>nepeta</i>	lesser calamint	GNRTNR	540315	Van Horn 1981
<i>Callicarpa americana</i>	American beautyberry	G5	32144	Van Horn 1981
<i>Calycanthus floridus</i>	eastern sweetshrub	G5	18142	Van Horn 1981
<i>Calycanthus floridus</i> var. <i>floridus</i>	eastern sweetshrub	G5T4	527038	Dickson & Nixon 1989
<i>Calycocarpum lyonii</i>	cupseed	G5	18862	Van Horn 1981
<i>Calystegia sepium</i>	hedge false bindweed	G5	30650	Van Horn 1981
<i>Campanula divaricata</i>	small bonny bellflower	G4	34482	Van Horn 1981
<i>Campanulastrum americanum</i>	American bellflower	G5	501172	Van Horn 1981
<i>Campsis radicans</i>	trumpet creeper	G5	34309	Van Horn 1981
<i>Cannabis sativa</i>	marijuana	GNR	19109	NatureServe 2006
<i>Capsella bursa-pastoris</i>	shepherd's purse	GNR	22766	Van Horn 1981
<i>Cardamine bulbosa</i>	bulbous bittercress	G5	22769	Van Horn 1981
<i>Cardamine diphylla</i>	crinkleroot	G5	22792	NatureServe 2006
<i>Cardamine dissecta</i>	forkleaf toothwort	G4?	501194	Van Horn 1981
<i>Cardamine hirsuta</i>	hairy bittercress	GNR	22797	Van Horn 1981
<i>Cardamine parviflora</i>	sand bittercress	G5	22806	Van Horn 1981
<i>Cardamine pennsylvanica</i>	Pennsylvania bittercress	G5	22772	Dickson & Nixon 1989
<i>Cardamine rotundifolia</i>	American bittercress	G4	22810	Van Horn 1981
<i>Carex amphibola</i>	eastern narrowleaf sedge	G5	39491	NatureServe 2006
<i>Carex annectens</i>	yellowfruit sedge	G5	39373	NatureServe 2006
<i>Carex blanda</i>	eastern woodland sedge	G5?	39379	NatureServe 2006
<i>Carex caroliniana</i>	Carolina sedge	G5	39382	Van Horn 1981
<i>Carex cephalophora</i>	oval-leaf sedge	G5	39383	NatureServe 2006
<i>Carex cherokeensis</i>	Cherokee sedge	G4G5	39545	Van Horn 1981

**Table 2. List of all plants historically documented at Chickamauga and Chattanooga National Military Park.**

Scientific Name	Common Name	GRank	TSN	Data Source
<i>Carex complanata</i>	hirsute sedge	G5	39551	NatureServe 2006
<i>Carex crawei</i>	Crawe's sedge	G5	39558	Sutter et al.; Van Horn 1981
<i>Carex glaucescens</i>	southern waxy sedge	G4	39396	NatureServe 2006
<i>Carex granularis</i>	limestone meadow sedge	G5	39398	NatureServe 2006
<i>Carex grayi</i>	Gray's sedge	G4	39622	Van Horn 1981
<i>Carex kraliana</i>	Kral's sedge	G5		NatureServe 2006
<i>Carex leavenworthii</i>	Leavenworth's sedge	G5	39663	Van Horn 1981
<i>Carex lucorum</i> var. <i>australucorum</i>	Blue Ridge sedge	G4T3?	527121	NatureServe 2006
<i>Carex lupulina</i>	hop sedge	G5	39413	NatureServe 2006
<i>Carex meadii</i>	Mead's sedge	G4G5	39686	Sutter et al.
<i>Carex muehlenbergii</i> var. <i>enervis</i>	Muhlenberg's sedge	G5T5	527128	NatureServe 2006
<i>Carex nigromarginata</i>	black edge sedge	G5	39719	NatureServe 2006
<i>Carex oxylepis</i>	sharp-scale sedge	G5?	39424	NatureServe 2006
<i>Carex pennsylvanica</i>	Pennsylvania sedge	G5	39749	Dickson & Nixon 1989
<i>Carex retroflexa</i>	reflexed sedge	G5	39782	Van Horn 1981
<i>Carex rosea</i>	rosy sedge	G5	39429	NatureServe 2006
<i>Carex squarrosa</i>	squarrose sedge	G4G5	39815	NatureServe 2006
<i>Carex tribuloides</i>	blunt broom sedge	G5	39438	NatureServe 2006
<i>Carex typhina</i>	cattail sedge	G5	39439	NatureServe 2006
<i>Carex virescens</i>	ribbed sedge	G5	39867	NatureServe 2006
<i>Carex willdenowii</i>	Willdenow's sedge	G5	39443	NatureServe 2006
<i>Carpinus caroliniana</i>	American hornbeam	G5	19504	Van Horn 1981
<i>Carya alba</i>	mockernut hickory	G5	501306	Van Horn 1981
<i>Carya carolinae-septentrionalis</i>	southern shagbark hickory	G5?	501307	NatureServe 2006
<i>Carya cordiformis</i>	bitternut hickory	G5	19227	Van Horn 1981
<i>Carya glabra</i>	pignut hickory	G5	19231	Van Horn 1981
<i>Carya laciniosa</i>	shellbark hickory	G5	19235	Van Horn 1981
<i>Carya ovalis</i>	red hickory	G5	19241	Van Horn 1981
<i>Carya ovata</i>	shagbark hickory	G5	19242	Van Horn 1981
<i>Carya pallida</i>	sand hickory	G5	19244	NatureServe 2006
<i>Castanea dentata</i>	American chestnut	G4	19454	Van Horn 1981
<i>Castanea mollissima</i>	Chinese chestnut	GNR	501318	Van Horn 1981
<i>Ceanothus americanus</i>	New Jersey tea	G5	28454	Van Horn 1981
<i>Celastrus orbiculata</i>	<i>Celastrus orbiculatus</i>	GNR	506068	Rogers 2000
<i>Celtis laevigata</i>	sugarberry	G5	19042	NatureServe 2006
<i>Celtis occidentalis</i>	common hackberry	G5	19040	Van Horn 1981
<i>Celtis tenuifolia</i>	dwarf hackberry	G5	19046	NatureServe 2006

**Table 2. List of all plants historically documented at Chickamauga and Chattanooga National Military Park.**

Scientific Name	Common Name	GRank	TSN	Data Source
<i>Centrosema virginianum</i>	spurred butterfly pea	G5	25778	Van Horn 1981
<i>Cerastium brachypetalum</i>	gray chickweed	GNR	19949	NatureServe 2006
<i>Cerastium nutans</i>	nodding chickweed	G5	19958	Van Horn 1981
<i>Cercis canadensis</i>	eastern redbud	G5	25782	Van Horn 1981
<i>Chaerophyllum tainturieri</i>	hairyfruit chervil	G5	29617	Van Horn 1981
<i>Chamaecrista fasciculata</i>	partridge pea	G5	501383	Van Horn 1981
<i>Chamaecrista nictitans</i> ssp. <i>nictitans</i>	sensitive partridge pea	G5T5	523837	Van Horn 1981
<i>Chamaelirium luteum</i>	fairywand	G5	42894	Van Horn 1981
<i>Chamaesyce maculata</i>	spotted sandmat	G5?	565061	Van Horn 1981
<i>Chamaesyce nutans</i>	eyebane	G5	501442	NatureServe 2006
<i>Chasmanthium latifolium</i>	Indian woodoats	G5	41547	Van Horn 1981
<i>Chasmanthium laxum</i>	slender woodoats	G5	41548	NatureServe 2006
<i>Chasmanthium sessiliflorum</i>	longleaf woodoats	G5	41551	NatureServe 2006
<i>Chelone lyonii</i>	pink turtlehead	G4	33184	Van Horn 1981
<i>Chimaphila maculata</i>	striped prince's pine	G5	23767	Van Horn 1981
<i>Chionanthus virginicus</i>	white fringetree	G5	32950	Van Horn 1981
<i>Chrysopsis mariana</i>	Maryland goldenaster	G5	202495	Van Horn 1981
<i>Cicuta maculata</i>	spotted water hemlock	G5	29456	Dickson & Nixon 1989
<i>Cinna arundinacea</i>	sweet woodreed	G5	40583	NatureServe 2006
<i>Cirsium altissimum</i>	tall thistle	G5	36337	Van Horn 1981
<i>Cirsium carolinianum</i>	soft thistle	G5	36352	Van Horn 1981
<i>Cladrastis kentukea</i>	Kentucky yellowwood	G4	26539	NatureServe 2006
<i>Claytonia virginica</i>	Virginia springbeauty	G5	20382	Van Horn 1981
<i>Clematis glaucophylla</i>	whiteleaf leather flower	G4?	18698	Van Horn 1981
<i>Clematis terniflora</i>	sweet autumn virginsbower	GNR	18712	Van Horn 1981
<i>Clematis virginiana</i>	devil's darning needles	G5	18716	Van Horn 1981
<i>Cocculus carolinus</i>	Carolina coralbead	G5	18864	NatureServe 2006
<i>Collinsonia canadensis</i>	richweed	G5	32474	Van Horn 1981
<i>Collinsonia tuberosa</i>	deepwoods horsebalm	G3G4	32475	NatureServe 2006

**Table 2. List of all plants historically documented at Chickamauga and Chattanooga National Military Park.**

Scientific Name	Common Name	GRank	TSN	Data Source
<i>Collinsonia verticillata</i>	stoneroot	G3	32476	NatureServe 2006
<i>Commelina communis</i>	Asiatic dayflower	G5	39127	Van Horn 1981
<i>Conoclinium coelestinum</i>	blue mistflower	G5	511282	Van Horn 1981
<i>Conopholis americana</i>	American cancer-root	G5	34274	Van Horn 1981
<i>Conringia orientalis</i>	hare's ear mustard	GNR	23103	Van Horn 1981
<i>Corallorhiza odontorhiza</i>	autumn coralroot	G5	43525	Van Horn 1981
<i>Corallorhiza wisteriana</i>	spring coralroot	G5	43528	Van Horn 1981
<i>Coreopsis basalis</i>	goldenmane tickseed	G5	37125	NatureServe 2006
<i>Coreopsis major</i>	greater tickseed	G5	37143	Van Horn 1981
<i>Coreopsis tinctoria</i>	golden tickseed	G5	37153	Van Horn 1981
<i>Cornus amomum</i>	silky dogwood	G5	27799	NatureServe 2006
<i>Cornus florida</i>	flowering dogwood	G5	27806	Van Horn 1981
<i>Cornus foemina</i>	stiff dogwood	G5	27803	NatureServe 2006
<i>Corylus cornuta</i>	beaked hazelnut	G5	19507	NatureServe 2006
<i>Crataegus flabellata</i>	fanleaf hawthorn	G4	24561	Dickson & Nixon 1989
<i>Crataegus marshallii</i>	parsley hawthorn	G5	24584	NatureServe 2006
<i>Crataegus pedicellata</i>	scarlet hawthorn	G5	501747	NatureServe 2006
<i>Crataegus spathulata</i>	littlehip hawthorn	G5	24603	Van Horn 1981
<i>Croton capitatus</i>	hogwort	G5	28266	Van Horn 1981
<i>Croton glandulosus</i>	vente conmigo	G5	28275	NatureServe 2006
<i>Croton monanthogynus</i>	prairie tea	G5	28283	Van Horn 1981
<i>Cryptotaenia canadensis</i>	Canadian honewort	G5	29475	NatureServe 2006
<i>Cunila origanoides</i>	common dittany	G5	32483	NatureServe 2006
<i>Cuscuta gronovii</i>	scaldweed	G5	30712	NatureServe 2006
<i>Cymbalaria muralis</i>	Kenilworth ivy	GNR	33579	Van Horn 1981
<i>Cynanchum laeve</i>	honeysuckle	G5	501893	Van Horn 1981
<i>Cynodon dactylon</i>	Bermudagrass	GNR	41619	Van Horn 1981
<i>Cynoglossum virginianum</i>	wild comfrey	G5	31891	Van Horn 1981
<i>Cyperus echinatus</i>	globe flatsedge	G5	501920	Van Horn 1981
<i>Cyperus esculentus</i>	yellow nutsedge	G5	39888	NatureServe 2006
<i>Cyperus flavescens</i>	yellow flatsedge	G5	39891	Van Horn 1981
<i>Cyperus lancastris</i>	manyflower flatsedge	G5	39893	Van Horn 1981
<i>Cyperus lupulinus</i>	Great Plains flatsedge	G5	501933	NatureServe 2006

**Table 2. List of all plants historically documented at Chickamauga and Chattanooga National Military Park.**

Scientific Name	Common Name	GRank	TSN	Data Source
<i>Cyperus polystachyos</i> var. <i>texensis</i>	Texan flatsedge	G5T5	527644	Van Horn 1981
<i>Cyperus retrofractus</i>	rough flatsedge	G5	39961	NatureServe 2006
<i>Cyperus retrorsus</i>	pine barren flatsedge	G5	39898	NatureServe 2006
<i>Cyperus strigosus</i>	strawcolored flatsedge	G5	39901	Van Horn 1981
<i>Cypripedium acaule</i>	moccasin flower	G5	43534	NatureServe 2006
<i>Cypripedium parviflorum</i> var. <i>pubescens</i>	greater yellow lady's slipper	G5T5	501945	Van Horn 1981
<i>Dactylis glomerata</i>	orchardgrass	GNR	193446	Van Horn 1981
<i>Dalea candida</i>	white prairie clover	G5	26603	Sutter et al.
<i>Dalea gattingeri</i>	purpletassels	G3G4	26618	Sutter et al.; Van Horn 1981
<i>Dalea purpurea</i>	purple prairie clover	G5	26642	Sutter et al.
<i>Danthonia spicata</i>	poverty oatgrass	G5	41642	Van Horn 1981
<i>Daucus carota</i>	Queen Anne's lace	GNR	29477	Van Horn 1981
<i>Daucus pusillus</i>	American wild carrot	G5	29478	Van Horn 1981
<i>Delphinium carolinianum</i>	Carolina larkspur	G5	18547	Van Horn 1981
<i>Delphinium carolinianum</i> ssp. <i>virescens</i>	Carolina larkspur	G5T5	18524	Sutter et al.
<i>Delphinium tricornes</i>	dwarf larkspur	G5	18515	Van Horn 1981
<i>Dennstaedtia punctilobula</i>	eastern hayscented fern	G5	17491	Van Horn 1981
<i>Deschampsia flexuosa</i>	wavy hairgrass	G5	40595	Dickson & Nixon 1989
<i>Desmanthus illinoensis</i>	Illinois bundleflower	G5	26661	Van Horn 1981
<i>Desmodium ciliare</i>	hairy small-leaf ticktrefoil	G5	25793	NatureServe 2006
<i>Desmodium glabellum</i>	Dillenius' ticktrefoil	G5	25799	Van Horn 1981
<i>Desmodium glutinosum</i>	pointedleaf ticktrefoil	G5	25800	Van Horn 1981
<i>Desmodium nudiflorum</i>	nakedflower ticktrefoil	G5	25812	Van Horn 1981
<i>Desmodium obtusum</i>	stiff ticktrefoil	G4G5	502019	NatureServe 2006
<i>Desmodium paniculatum</i>	panicledleaf ticktrefoil	G5	25815	NatureServe 2006
<i>Desmodium rotundifolium</i>	prostrate ticktrefoil	G5	502020	NatureServe 2006
<i>Deutzia X magnifica</i>	Deutzia			Van Horn 1981
<i>Dianthus armeria</i>	Deptford pink	GNR	20276	Van Horn 1981
<i>Dichanthelium acuminatum</i> var. <i>fasciculatum</i>	western panicgrass	G5T5	41670	Van Horn 1981

**Table 2. List of all plants historically documented at Chickamauga and Chattanooga National Military Park.**

Scientific Name	Common Name	GRank	TSN	Data Source
<i>Dichanthelium boscii</i>	Bosc's panicgrass	G5	41655	Van Horn 1981
<i>Dichanthelium clandestinum</i>	deertongue	G5?	41656	NatureServe 2006
<i>Dichanthelium commutatum</i>	variable panicgrass	G5	41647	NatureServe 2006
<i>Dichanthelium depauperatum</i>	starved panicgrass	G5	41658	NatureServe 2006
<i>Dichanthelium dichotomum</i>	cypress panicgrass	G5	41659	Dickson & Nixon 1989
<i>Dichanthelium dichotomum</i> var. <i>ensifolium</i>	cypress panicgrass	G5T4T5	512243	NatureServe 2006
<i>Dichanthelium laxiflorum</i>	openflower rosette grass	G5	41661	Van Horn 1981
<i>Dichanthelium meridionale</i>	matting rosette grass	G5	502036	NatureServe 2006
<i>Dichanthelium scabriusculum</i>	woolly rosette grass	G4	41670	Van Horn 1981
<i>Dichanthelium sphaerocarpon</i>	roundseed panicgrass	G5	41671	NatureServe 2006
<i>Dichanthelium sphaerocarpon</i> var. <i>isophyllum</i>	roundseed panicgrass	G5T5	527701	NatureServe 2006
<i>Dichondra carolinensis</i>	Carolina ponysfoot	G5	30834	NatureServe 2006
<i>Diervilla florida</i> X <i>coraeensis</i>				Dickson & Nixon 1989; BONAP
<i>Diervilla rivularis</i>	mountain bush honeysuckle	G3	35311	NRMAP
<i>Digitaria filiformis</i>	slender crabgrass	G5	40608	Van Horn 1981
<i>Digitaria ischaemum</i>	smooth crabgrass	GNR	40637	Van Horn 1981
<i>Digitaria sanguinalis</i>	hairy crabgrass	G5	40604	NatureServe 2006
<i>Diodia teres</i>	poorjoe	G5	34789	NatureServe 2006
<i>Diodia virginiana</i>	Virginia buttonweed	G5	34790	Van Horn 1981
<i>Dioscorea oppositifolia</i>	Chinese yam	GNR	502075	Van Horn 1981; TNEPPC 2001
<i>Dioscorea quaternata</i>	fourleaf yam	G5	43371	NatureServe 2006
<i>Dioscorea villosa</i>	wild yam	G4G5	43367	Van Horn 1981
<i>Diospyros virginiana</i>	common persimmon	G5	23855	Van Horn 1981
<i>Diplazium pycnocarpon</i>	glade fern	G5	502095	Van Horn 1981
<i>Dodecatheon meadia</i>	pride of Ohio	G5	23969	Sutter et al.
<i>Doellingeria infirma</i>	cornel-leaf whitetop	G5	508087	Van Horn 1981; Dickson & Nixon 1989
<i>Doellingeria umbellata</i>	parasol whitetop	G5	508093	NatureServe 2006
<i>Draba verna</i>	spring draba	GNR	22923	Van Horn 1981

**Table 2. List of all plants historically documented at Chickamauga and Chattanooga National Military Park.**

Scientific Name	Common Name	GRank	TSN	Data Source
<i>Dryopteris marginalis</i>	marginal woodfern	G5	17541	Van Horn 1981
<i>Echinacea purpurea</i>	eastern purple coneflower	G4	37281	Van Horn 1981
<i>Echinochloa crus-galli</i>	barnyardgrass	GNR	502210	NatureServe 2006
<i>Eclipta prostrata</i>	false daisy	G5	196226	NatureServe 2006
<i>Elaeagnus pungens</i>	thorny olive	GNR	502223	Van Horn 1981; TNEPPC 2001
<i>Eleocharis compressa</i>	flatstem spikerush	G4	40012	Sutter et al.
<i>Eleocharis obtusa</i>	blunt spikerush	G5	40017	NatureServe 2006
<i>Eleocharis tricostata</i>	three-angle spikerush	G4	40023	Van Horn 1981
<i>Elephantopus carolinianus</i>	Carolina elephantsfoot	G5	37297	NatureServe 2006
<i>Elephantopus tomentosus</i>	devil's grandmother	G5	37300	Van Horn 1981
<i>Eleusine indica</i>	Indian goosegrass	GNR	41692	NatureServe 2006
<i>Elymus hystrix</i>	eastern bottlebrush grass	G5	40698	NatureServe 2006
<i>Elymus virginicus</i>	Virginia wildrye	G5	40681	Van Horn 1981
<i>Epigaea repens</i>	trailing arbutus	G5	23646	Van Horn 1981
<i>Eragrostis capillaris</i>	lace grass	G5	40774	Van Horn 1981
<i>Eragrostis spectabilis</i>	purple lovegrass	G5	40717	NatureServe 2006
<i>Erechtites hieraciifolia</i>	American burnweed	G5	37320	Dickson & Nixon 1989
<i>Erigeron annuus</i>	eastern daisy fleabane	G5	35804	Van Horn 1981
<i>Erigeron philadelphicus</i>	Philadelphia fleabane	G5	35809	Van Horn 1981
<i>Erigeron pulchellus</i>	robin's plantain	G5	35808	Van Horn 1981
<i>Erigeron strigosus</i>	prairie fleabane	G5	35951	Van Horn 1981
<i>Eryngium yuccifolium</i>	button eryngo	G5	29506	Van Horn 1981
<i>Erythronium americanum</i>	dogtooth violet	G5	196365	Van Horn 1981
<i>Euonymus alatus</i>	burningbush	GNR	27946	Dickson & Nixon 1989
<i>Euonymus americanus</i>	bursting-heart	G5	27947	Van Horn 1981; Dickson & Nixon 1989
<i>Euonymus atropurpureus</i>	burningbush	G5	27948	Van Horn 1981
<i>Euonymus bungeanus</i>	winterberry euonymus	GNR	502580	Van Horn 1981; BONAP database
<i>Euonymus fortunei</i>	winter creeper	GNR	27950	NatureServe 2006
<i>Eupatorium capillifolium</i>	dogfennel	G5	35978	NatureServe 2006

**Table 2. List of all plants historically documented at Chickamauga and Chattanooga National Military Park.**

Scientific Name	Common Name	GRank	TSN	Data Source
<i>Eupatorium fistulosum</i>	>>Eupatoriadelphus fistulosus	G5?	502509	Van Horn 1981
<i>Eupatorium hyssopifolium</i>	hyssopleaf thoroughwort	G5	35979	NatureServe 2006
<i>Eupatorium perfoliatum</i>	common boneset	G5	35980	NatureServe 2006
<i>Eupatorium purpureum</i>	sweetscented joepeyeweed	G5	502522	Van Horn 1981
<i>Eupatorium serotinum</i>	lateflowering thoroughwort	G5	35981	Van Horn 1981
<i>Eupatorium sessilifolium</i>	upland boneset	G5	36004	NatureServe 2006
<i>Euphorbia corollata</i>	flowering spurge	G5	28057	Van Horn 1981
<i>Euphorbia davidii</i>	David's spurge	GNR	502535	Van Horn 1981
<i>Euphorbia mercurialina</i>	mercury spurge	G4	28101	Van Horn 1981
<i>Euphorbia pubentissima</i>	false flowering spurge	G5	28125	NatureServe 2006
<i>Eurybia divaricata</i>	white wood aster	G5	522198	Van Horn 1981; Dickson & Nixon 1989
<i>Eurybia hemispherica</i>	southern prairie aster	G4	193228	Van Horn 1981
<i>Eurybia paludosa</i>	southern swamp aster	GNR	513452	Van Horn 1981
<i>Fagus grandifolia</i>	American beech	G5	19462	Van Horn 1981
<i>Festuca subverticillata</i>	nodding fescue	G5	502612	NatureServe 2006
<i>Fleischmannia incarnata</i>	pink thoroughwort	G5	37385	NatureServe 2006
<i>Forsythia viridissima</i>	greenstem forsythia	GNR	32963	Van Horn 1981
<i>Fragaria virginiana</i>	Virginia strawberry	G5	24639	Van Horn 1981
<i>Frangula caroliniana</i>	Carolina buckthorn	G5	506986	Van Horn 1981
<i>Fraxinus americana</i>	white ash	G5	32931	Van Horn 1981
<i>Fraxinus pennsylvanica</i>	green ash	G5	32929	NatureServe 2006
<i>Fraxinus quadrangulata</i>	blue ash	G5	32947	BCD
<i>Galactia volubilis</i>	downy milkpea	G5	26703	NatureServe 2006
<i>Galinsoga quadriradiata</i>	shaggy soldier	GNR	37415	Van Horn 1981
<i>Galium aparine</i>	stickywilly	G5	34797	Van Horn 1981
<i>Galium circaezans</i>	licorice bedstraw	G5	34800	NatureServe 2006
<i>Galium latifolium</i>	purple bedstraw	G5	34883	Dickson & Nixon 1989
<i>Galium obtusum</i>	bluntleaf bedstraw	G5	34802	NatureServe 2006

**Table 2. List of all plants historically documented at Chickamauga and Chattanooga National Military Park.**

Scientific Name	Common Name	GRank	TSN	Data Source
<i>Galium obtusum</i> ssp. <i>obtusum</i>	bluntleaf bedstraw	G5T4	524097	NatureServe 2006
<i>Galium pilosum</i>	hairy bedstraw	G5	34907	Van Horn 1981
<i>Galium triflorum</i>	fragrant bedstraw	G5	34933	Dickson & Nixon 1989
<i>Gamochaeta purpurea</i>	spoonleaf purple everlasting	G5	37421	Van Horn 1981
<i>Gaura filipes</i>	slenderstalk beeblossom	G5	27649	Van Horn 1981
<i>Geranium carolinianum</i>	Carolina geranium	G5	29105	Van Horn 1981
<i>Geranium dissectum</i>	cutleaf geranium	GNR	29135	Van Horn 1981
<i>Geranium maculatum</i>	spotted geranium	G5	29107	Van Horn 1981
<i>Geranium molle</i>	dovefoot geranium	GNR	29110	Van Horn 1981
<i>Geum canadense</i>	white avens	G5	24645	Van Horn 1981
<i>Geum vernum</i>	spring avens	G5	24664	NatureServe 2006
<i>Ginkgo biloba</i>	maidenhair tree	G1	183269	Van Horn 1981
<i>Glechoma hederacea</i>	ground ivy	GNR	502801	Van Horn 1981
<i>Gleditsia triacanthos</i>	honeylocust	G5	26714	Van Horn 1981
<i>Glyceria melicaria</i>	melic mannagrass	G5	40849	NatureServe 2006
<i>Glyceria striata</i>	fowl mannagrass	G5	40833	NatureServe 2006
<i>Goodyera pubescens</i>	downy rattlesnake plantain	G5	43594	Van Horn 1981
<i>Hamamelis virginiana</i>	American witchhazel	G5	19033	Dickson & Nixon 1989
<i>Hedera helix</i>	English ivy	GNR	29393	Van Horn 1981; Rogers 2000
<i>Helenium autumnale</i>	common sneezeweed	G5	36006	Van Horn 1981
<i>Helenium flexuosum</i>	purplehead sneezeweed	G5	36016	NatureServe 2006
<i>Helianthus angustifolius</i>	swamp sunflower	G5	502919	NatureServe 2006
<i>Helianthus divaricatus</i>	woodland sunflower	G5	36636	Van Horn 1981
<i>Helianthus hirsutus</i>	hairy sunflower	G5	36646	Van Horn 1981
<i>Helianthus microcephalus</i>	small woodland sunflower	G5	36654	Van Horn 1981
<i>Helianthus mollis</i>	ashy sunflower	G4G5	36655	Van Horn 1981
<i>Helianthus strumosus</i>	paleleaf woodland sunflower	G5	36690	Van Horn 1981
<i>Heliotropium tenellum</i>	pasture heliotrope	G5	31652	Sutter et al.; Van Horn 1981
<i>Hemerocallis fulva</i>	orange daylily	GNA	42943	Van Horn 1981
<i>Hepatica nobilis</i>	hepatica	G5	18779	Van Horn 1981
<i>Hesperis matronalis</i>	dames rocket	G4G5	23138	Van Horn 1981
<i>Heterotheca subaxillaris</i>	camphorweed	G5	37686	NatureServe 2006

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Scientific Name	Common Name	GRank	TSN	Data Source
<i>Heuchera americana</i>	American alumroot	G5	24340	Van Horn 1981
<i>Heuchera parviflora</i>	littleflower alumroot	G4	24365	Dickson & Nixon 1989
<i>Hexastylis arifolia</i>	littlebrownjug	G5	502983	Van Horn 1981
<i>Hibiscus moscheutos</i>	crimson-eyed rosemallow	G5	21612	Van Horn 1981
<i>Hibiscus syriacus</i>	rose of Sharon	GNR	21638	Van Horn 1981
<i>Hieracium paniculatum</i>	Allegheny hawkweed	G5	37718	Van Horn 1981
<i>Hieracium venosum</i>	rattlesnakeweed	G5	37734	Van Horn 1981
<i>Holosteum umbellatum</i>	jagged chickweed	GNR	503057	Van Horn 1981
<i>Hordeum pusillum</i>	little barley	G5	40866	Van Horn 1981
<i>Houstonia caerulea</i>	azure bluet	G5	35038	NatureServe 2006
<i>Houstonia longifolia</i>	longleaf summer bluet	G4G5	35045	Van Horn 1981
<i>Houstonia purpurea</i>	Venus' pride	G5	35051	Van Horn 1981
<i>Houstonia pusilla</i>	tiny bluet	G5	35052	Van Horn 1981
<i>Hydrangea arborescens</i>	wild hydrangea	G5	24195	Van Horn 1981
<i>Hydrangea cinerea</i>	ashy hydrangea	G4	24197	Van Horn 1981; Dickson & Nixon 1989
<i>Hydrophyllum macrophyllum</i>	largeleaf waterleaf	G5	31393	Van Horn 1981
<i>Hymenocallis caroliniana</i>	Carolina spiderlily	G4	503104	NatureServe 2006
<i>Hypericum canadense</i>	lesser Canadian St. Johnswort	G5	21417	Sutter et al.
<i>Hypericum cistifolium</i>	roundpod St. Johnswort	G5	21432	Van Horn 1981
<i>Hypericum dolabriforme</i>	straggling St. Johnswort	G4	21435	Sutter et al.; Van Horn 1981
<i>Hypericum drummondii</i>	nits and lice	G5	21436	NatureServe 2006
<i>Hypericum hypericoides</i>	St. Andrew's cross	G5	503138	Van Horn 1981
<i>Hypericum hypericoides</i> ssp. <i>multicaule</i>	St. Andrew's cross	G5T4	524170	NatureServe 2006
<i>Hypericum mutilum</i>	dwarf St. Johnswort	G5	21421	Dickson & Nixon 1989
<i>Hypericum punctatum</i>	spotted St. Johnswort	G5	21422	Dickson & Nixon 1989
<i>Hypericum sphaerocarpaceum</i>	roundseed St. Johnswort	G5	21460	Van Horn 1981
<i>Hypochaeris radicata</i>	hairy catsear	GNR	37794	Van Horn 1981
<i>Hypoxis hirsuta</i>	common goldstar	G5	503146	Van Horn 1981

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Scientific Name	Common Name	GRank	TSN	Data Source
<i>Hypoxis wrightii</i>	Wright's star-grass	G4	515037	Van Horn 1981
<i>Ilex cornuta</i>	Chinese holly	GNR	503155	NatureServe 2006
<i>Ilex decidua</i>	possumhaw	G5	27998	NatureServe 2006
<i>Ilex longipes</i>	Georgia holly	G5	536314	Dickson & Nixon 1989
<i>Ilex montana</i>	mountain holly	G5	536309	Dickson & Nixon 1989
<i>Ilex opaca</i>	American holly	G5	27982	Van Horn 1981
<i>Impatiens capensis</i>	jewelweed	G5	29182	Van Horn 1981
<i>Ionactis linariifolius</i>	flaxleaf whitetop aster	G5	507245	Dickson & Nixon 1989
<i>Ipomoea lacunosa</i>	whitestar	G5?	30776	Van Horn 1981
<i>Ipomoea nil</i>	whiteedge morning-glory	GU	503177	Van Horn 1981
<i>Ipomoea pandurata</i>	man of the earth	G5	30786	Van Horn 1981
<i>Ipomoea purpurea</i>	tall morning-glory	GNR	30789	NatureServe 2006
<i>Iris cristata</i>	dwarf crested iris	G5	43204	Van Horn 1981
<i>Isanthus brachiatus</i>	false pennyroyal	G5	515269	Van Horn 1981
<i>Isoetes butleri</i>	limestone quillwort	G4	17122	Sutter et al.
<i>Juglans nigra</i>	black walnut	G5	19254	Van Horn 1981
<i>Juncus bufonius</i>	toad rush	G5	39227	Van Horn 1981
<i>Juncus dudleyi</i>	Dudley's rush	G5	503249	Van Horn 1981
<i>Juncus tenuis</i>	poverty rush	G5	39243	Van Horn 1981
<i>Juniperus virginiana</i>	eastern redcedar	G5	18048	Van Horn 1981
<i>Kalmia latifolia</i>	mountain laurel	G5	23677	Van Horn 1981
<i>Krigia biflora</i>	twoflower dwarfdandelion	G5	37810	Van Horn 1981
<i>Krigia caespitosa</i>	weedy dwarfdandelion	G5	565260	NatureServe 2006
<i>Krigia virginica</i>	Virginia dwarfdandelion	G5	37816	NatureServe 2006
<i>Kummerowia stipulacea</i>	Korean clover	GNR	503293	Van Horn 1981
<i>Lactuca canadensis</i>	Canada lettuce	G5	36596	Van Horn 1981
<i>Lactuca floridana</i>	woodland lettuce	G5	36599	Van Horn 1981
<i>Lactuca serriola</i>	prickly lettuce	GNR	36608	NatureServe 2006
<i>Lagerstroemia indica</i>	crapemyrtle	GNR	27110	Van Horn 1981
<i>Lamium amplexicaule</i>	henbit deadnettle	GNR	32539	Van Horn 1981
<i>Lamium purpureum</i>	purple deadnettle	GNR	32543	Van Horn 1981
<i>Laportea canadensis</i>	Canadian woodnettle	G5	19127	NatureServe 2006
<i>Lathyrus latifolius</i>	perennial pea	GNR	25856	Van Horn 1981
<i>Leavenworthia exigua</i> var. <i>exigua</i>	Tennessee gladecress	G4T3	528700	NatureServe 2006
<i>Leavenworthia uniflora</i>	Michaux's gladecress	G4	503352	Sutter et al.; BONAP County Database

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Scientific Name	Common Name	GRank	TSN	Data Source
<i>Lechea minor</i>	thymeleaf pinweed	G5	22290	Dickson & Nixon 1989
<i>Lechea racemulosa</i>	Illinois pinweed	G5	22295	Dickson & Nixon 1989
<i>Leersia oryzoides</i>	rice cutgrass	G5	40886	NatureServe 2006
<i>Leersia virginica</i>	whitegrass	G5	40890	NatureServe 2006
<i>Lepidium campestre</i>	field pepperweed	GNR	22954	Van Horn 1981
<i>Lepidium virginicum</i>	Virginia pepperweed	G5	22955	Van Horn 1981
<i>Lespedeza cuneata</i>	sericea lespedeza	GNR	25898	Van Horn 1981; Rogers 2000
<i>Lespedeza procumbens</i>	trailing lespedeza	G5	25907	NatureServe 2006
<i>Lespedeza repens</i>	creeping lespedeza	G5	503402	NatureServe 2006
<i>Lespedeza violacea</i>	violet lespedeza	G5	25914	Van Horn 1981
<i>Lespedeza virginica</i>	slender lespedeza	G5	25915	Van Horn 1981
<i>Leucanthemum vulgare</i>	oxeye daisy	GNR	37903	Van Horn 1981
<i>Leucospora multifida</i>	narrowleaf paleseed	G5	33632	NatureServe 2006
<i>Liatris squarrosa</i>	scaly blazing star	G5	37945	Van Horn 1981
<i>Liatris squarrosa</i> var. <i>hirsuta</i>	scaly blazing star	G5T4?	528794	Sutter et al.
<i>Liatris squarrulosa</i>	Appalachian blazing star	G4G5	503447	Van Horn 1981
<i>Ligustrum sinense</i>	Chinese privet	GNR	32979	Van Horn 1981
<i>Ligustrum vulgare</i>	European privet	GNR	32980	Rogers 2000
<i>Lilium philadelphicum</i>	wood lily	G5	503459	Van Horn 1981
<i>Linaria vulgaris</i>	butter and eggs	GNR	33216	Van Horn 1981
<i>Lindera benzoin</i>	northern spicebush	G5	18147	Van Horn 1981
<i>Linum sulcatum</i>	grooved flax	G5	503494	Van Horn 1981
<i>Liquidambar styraciflua</i>	sweetgum	G5	19027	Van Horn 1981
<i>Liriodendron tulipifera</i>	tuliptree	G5	18086	Van Horn 1981
<i>Lithospermum canescens</i>	hoary puccoon	G5	31945	Van Horn 1981
<i>Lobelia cardinalis</i>	cardinalflower	G5	34505	Van Horn 1981
<i>Lobelia inflata</i>	Indian-tobacco	G5	34524	NatureServe 2006
<i>Lobelia nuttallii</i>	Nuttall's lobelia	G4G5	34527	Van Horn 1981
<i>Lobelia puberula</i>	downy lobelia	G5	34529	Van Horn 1981
<i>Lobelia spicata</i>	palespike lobelia	G5	34532	Van Horn 1981
<i>Lolium arundinaceum</i>	tall fescue	GNR	507979	NatureServe 2006
<i>Lonicera flava</i>	yellow honeysuckle	G5?	35292	NRMAP
<i>Lonicera fragrantissima</i>	sweet breath of spring	GNR	35293	Van Horn 1981; TNCPPC 2001
<i>Lonicera japonica</i>	Japanese honeysuckle	GNR	35283	Van Horn 1981; Rogers 2000

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Scientific Name	Common Name	GRank	TSN	Data Source
<i>Lonicera maackii</i>	Amur honeysuckle	GNR	35298	Rogers 2000
<i>Lonicera sempervirens</i>	trumpet honeysuckle	G5	35303	Van Horn 1981
<i>Ludwigia microcarpa</i>	smallfruit primrose-willow	G5	27353	Van Horn 1981
<i>Ludwigia palustris</i>	marsh seedbox	G5	27336	NatureServe 2006
<i>Lunaria annua</i>	annual honesty	GNR	23238	Dickson & Nixon 1989
<i>Luzula campestris</i>	field woodrush	G5	503590	Van Horn 1981
<i>Luzula echinata</i>	hedgehog woodrush	G5	39342	Dickson & Nixon 1989
<i>Lycopus rubellus</i>	taperleaf water horehound	G5	32261	NatureServe 2006
<i>Lysimachia ciliata</i>	fringed loosestrife	G5	23984	Van Horn 1981
<i>Lysimachia nummularia</i>	creeping jenny	GNR	23993	NatureServe 2006
<i>Lysimachia quadrifolia</i>	whorled yellow loosestrife	G5	23997	Van Horn 1981
<i>Lysimachia tonsa</i>	southern yellow loosestrife	G4	24001	Van Horn 1981
<i>Lythrum alatum</i>	winged lythrum	G5	27081	Van Horn 1981
<i>Lythrum alatum</i> var. <i>lanceolatum</i>	winged lythrum	G5T5	529064	Van Horn 1981
<i>Maclura pomifera</i>	osage orange	G4G5	19102	Van Horn 1981
<i>Macrothelypteris torresiana</i>	swordfern	G5	503649	NatureServe 2006
<i>Magnolia grandiflora</i>	southern magnolia	G5	18074	Van Horn 1981
<i>Mahonia bealei</i>	Beale's barberry	GNR	18846	Dickson & Nixon 1989
<i>Maianthemum racemosum</i> ssp. <i>racemosum</i>	feathery false lily of the valley	G5T5	524297	Van Horn 1981
<i>Malus angustifolia</i>	southern crabapple	G5?	25255	Van Horn 1981
<i>Manfreda virginica</i>	false aloe	G5	503687	Van Horn 1981
<i>Matelea gonocarpos</i>	angularfruit milkvine	G5	503702	Van Horn 1981
<i>Matelea obliqua</i>	climbing milkvine	G4?	30375	Sutter et al.; Van Horn 1981
<i>Mecardonia acuminata</i>	axilflower	G5	33645	Van Horn 1981
<i>Medeola virginiana</i>	Indian cucumber	G5	42963	Van Horn 1981
<i>Medicago lupulina</i>	black medick	GNR	503721	Van Horn 1981
<i>Melanthium parviflorum</i>	mountain bunchflower	G4?	42966	Dickson & Nixon 1989
<i>Melica mutica</i>	twoflower melicgrass	G5	41858	Van Horn 1981
<i>Melilotus officinalis</i>	yellow sweetclover	GNR	26150	Van Horn 1981
<i>Menispermum canadense</i>	common moonseed	G5	18871	NatureServe 2006

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Scientific Name	Common Name	GRank	TSN	Data Source
<i>Mercurialis annua</i>	annual mercury	GNR	28354	NatureServe 2006
<i>Microstegium vimineum</i>	Nepalese browntop	GNR	503829	Dickson & Nixon 1989; TNEPPC 2001
<i>Mimosa microphylla</i>	littleleaf sensitive-briar	G5	537549	Van Horn 1981
<i>Mimulus ringens</i>	Allegheny monkeyflower	G5	33235	Van Horn 1981
<i>Minuartia patula</i>	pitcher's stitchwort	G4	20009	NatureServe 2006
<i>Mirabilis jalapa</i>	marvel of Peru	GNR	19648	NatureServe 2006
<i>Mitchella repens</i>	partridgeberry	G5	35063	Van Horn 1981
<i>Mitreola petiolata</i>	lax hornpod	G5	503858	Van Horn 1981
<i>Mollugo verticillata</i>	green carpetweed	GNR	19899	NatureServe 2006
<i>Monarda bradburiana</i>	eastern beebalm	G5	565311	Van Horn 1981
<i>Monotropa hypopithys</i>	pinemap	G5	503871	Dickson & Nixon 1989
<i>Monotropa uniflora</i>	Indianpipe	G5	23778	Van Horn 1981
<i>Morus alba</i>	white mulberry	GNR	19066	NatureServe 2006
<i>Morus rubra</i>	red mulberry	G5	19070	Van Horn 1981
<i>Mosla dianthera</i>	miniature beefsteakplant	GNR	32621	NatureServe 2006
<i>Muhlenbergia schreberi</i>	nimblewill	G5	41939	NatureServe 2006
<i>Muhlenbergia sobolifera</i>	rock muhly	G5	41941	NatureServe 2006
<i>Murdannia keisak</i>	wartremoving herb	GNR	39145	NatureServe 2006
<i>Myosotis macrosperma</i>	largeseed forget-me-not	G5	31695	Van Horn 1981
<i>Narcissus poeticus</i>	poet's narcissus	GNR	503929	Van Horn 1981
<i>Narcissus pseudonarcissus</i>	daffodil	GNR	503930	Van Horn 1981
<i>Narcissus X incomparabilis</i>		GNA	503925	Van Horn 1981
<i>Nepeta cataria</i>	catnip	GNR	32623	Van Horn 1981
<i>Nothoscordum bivalve</i>	crowpoison	G4	503966	Van Horn 1981
<i>Nuttallanthus canadensis</i>	Canada toadflax	G5	503969	NatureServe 2006
<i>Nyssa sylvatica</i>	blackgum	G5	27821	Van Horn 1981
<i>Oenothera biennis</i>	common evening-primrose	G5	27368	Van Horn 1981
<i>Oenothera fruticosa</i> ssp. <i>glauca</i>	narrowleaf evening-primrose	G5T5	517744	Van Horn 1981
<i>Oenothera speciosa</i>	pinkladies	G5	27415	Van Horn 1981
<i>Oenothera triloba</i>	stemless evening-primrose	G4	27420	Sutter et al.
<i>Oligoneuron album</i>	prairie goldenrod	G5	507631	Sutter et al.; Van Horn 1981

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Scientific Name	Common Name	GRank	TSN	Data Source
<i>Oligoneuron rigidum</i> var. <i>rigidum</i>	stiff goldenrod	G5T5	36297	Van Horn 1981
<i>Onoclea sensibilis</i>	sensitive fern	G5	17637	NatureServe 2006
<i>Onosmodium molle</i> ssp. <i>occidentale</i>	>> <i>Onosmodium bejariense</i> var. <i>occidentale</i>	G4G5T4?	524375	Sutter et al.; Van Horn 1981
<i>Ophioglossum engelmannii</i>	limestone adderstongue	G5	504032	Sutter et al.; Van Horn 1981
<i>Opuntia humifusa</i> var. <i>humifusa</i>	devil's-tongue	G5T5	531092	Van Horn 1981
<i>Osmorhiza longistylis</i>	longstyle sweetroot	G5	29791	Dickson & Nixon 1989
<i>Osmunda claytoniana</i>	interrupted fern	G5	17220	Van Horn 1981
<i>Ostrya virginiana</i>	hophornbeam	G5	19511	NatureServe 2006
<i>Oxalis dillenii</i>	slender yellow woodsorrel	G5	29095	Van Horn 1981
<i>Oxalis violacea</i>	violet woodsorrel	G5	29098	Van Horn 1981
<i>Oxydendrum arboreum</i>	sourwood	G5	23690	Van Horn 1981
<i>Packera anonyma</i>	Small's ragwort	G5	518137	Van Horn 1981
<i>Packera glabella</i>	butterweed	G5	565358	Van Horn 1981
<i>Packera obovata</i>	roundleaf ragwort	G5	565368	Van Horn 1981
<i>Packera paupercula</i>	balsam groundsel	G5	518155	NatureServe 2006
<i>Packera plattensis</i>	prairie groundsel	G5	565369	Sutter et al.
<i>Panax quinquefolius</i>	American ginseng	G3G4	29399	Van Horn 1981
<i>Panicum anceps</i>	beaked panicgrass	G5	538221	Van Horn 1981
<i>Panicum capillare</i>	witchgrass	G5	40914	NatureServe 2006
<i>Panicum dichotomiflorum</i>	fall panicgrass	G5	40908	NatureServe 2006
<i>Panicum flexile</i>	wiry panicgrass	G5	40918	Van Horn 1981
<i>Panicum gattingeri</i>	Gattinger's panicgrass	G4	40933	NatureServe 2006
<i>Panicum rigidulum</i> var. <i>rigidulum</i>	redtop panicgrass	G5T5?	40902	Van Horn 1981
<i>Panicum virgatum</i>	switchgrass	G5	40913	NatureServe 2006
<i>Parthenium integrifolium</i>	wild quinine	G5	38166	Van Horn 1981
<i>Parthenocissus quinquefolia</i>	Virginia creeper	G5	28602	Van Horn 1981
<i>Paspalum dilatatum</i>	dallisgrass	GNR	40997	Van Horn 1981
<i>Paspalum floridanum</i>	Florida paspalum	G5	40992	Van Horn 1981
<i>Paspalum laeve</i>	field paspalum	G4G5	41024	NatureServe 2006
<i>Paspalum pubiflorum</i>	hairyseed paspalum	G5	529415	NatureServe 2006
<i>Passiflora incarnata</i>	purple passionflower	G5	504139	NatureServe 2006
<i>Passiflora lutea</i>	yellow passionflower	G5	22226	Van Horn 1981

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Scientific Name	Common Name	GRank	TSN	Data Source
<i>Paulownia tomentosa</i>	princesstree	GNR	33460	Van Horn 1981; Rogers 2000
<i>Pedicularis canadensis</i>	Canadian lousewort	G5	33362	Van Horn 1981
<i>Pediomelum subacaule</i>	whiterim scurfpea	G4	504187	Sutter et al.; Van Horn 1981
<i>Pellaea atropurpurea</i>	purple cliffbrake	G5	17641	Van Horn 1981
<i>Pennisetum glaucum</i>	pearl millet	GNR	565385	NatureServe 2006
<i>Penstemon canescens</i>	eastern gray beardtongue	G4	33846	Van Horn 1981
<i>Penthorum sedoides</i>	ditch stonecrop	G5	504241	NatureServe 2006
<i>Perilla frutescens</i>	beefsteakplant	GNR	32634	NatureServe 2006
<i>Phacelia bipinnatifida</i>	fernleaf phacelia	G5	31459	Dickson & Nixon 1989
<i>Phegopteris hexagonoptera</i>	broad beechfern	G5	504296	Van Horn 1981
<i>Philadelphus hirsutus</i>	streambank mock orange	G5	24427	Van Horn 1981
<i>Philadelphus inodorus</i>	scentless mock orange	G4G5	24429	Van Horn 1981
<i>Phleum pratense</i>	timothy	GNR	41062	Van Horn 1981
<i>Phlox amoena</i>	hairy phlox	G4	30910	Van Horn 1981
<i>Phlox amplifolia</i>	largeleaf phlox	G3G5	30911	NatureServe 2006
<i>Phlox carolina</i>	thickleaf phlox	G5?	30921	Van Horn 1981
<i>Phlox divaricata</i>	wild blue phlox	G5	30934	Van Horn 1981
<i>Phoradendron leucarpum</i>	oak mistletoe	G5	504341	Van Horn 1981
<i>Photinia pyrifolia</i>	red chokeberry	G5	565398	Van Horn 1981
<i>Phryma leptostachya</i>	American lopseed	G5	504348	Van Horn 1981
<i>Physalis angulata</i>	cutleaf groundcherry	G5	30590	NatureServe 2006
<i>Physalis virginiana</i>	Virginia groundcherry	G5	30612	NatureServe 2006
<i>Physostegia virginiana</i>	obedient plant	G5	32391	Van Horn 1981
<i>Phytolacca americana</i>	American pokeweed	G5	19523	Van Horn 1981
<i>Pilea pumila</i>	Canadian clearweed	G5	19130	Dickson & Nixon 1989
<i>Pinus echinata</i>	shortleaf pine	G5	183335	Van Horn 1981
<i>Pinus strobus</i>	eastern white pine	G5	183385	Van Horn 1981
<i>Pinus taeda</i>	loblolly pine	G5	18037	Van Horn 1981
<i>Pinus virginiana</i>	Virginia pine	G5	183394	Van Horn 1981
<i>Piptochaetium avenaceum</i>	blackseed speargrass	G5	504408	Van Horn 1981
<i>Pityopsis graminifolia</i>	narrowleaf silkgrass	G5	196349	Van Horn 1981
<i>Plantago cordata</i>	heartleaf plantain	G4	32876	Sutter et al.
<i>Plantago lanceolata</i>	narrowleaf plantain	G5	32874	Van Horn 1981

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Scientific Name	Common Name	GRank	TSN	Data Source
<i>Plantago major</i>	common plantain	G5	32887	Van Horn 1981
<i>Plantago rugelii</i>	blackseed plantain	G5	504439	Van Horn 1981
<i>Plantago sparsiflora</i>	pineland plantain	G3	32911	Van Horn 1981
<i>Plantago virginica</i>	Virginia plantain	G5	32895	Van Horn 1981
<i>Platanus occidentalis</i>	American sycamore	G5	19020	Van Horn 1981
<i>Pleopeltis polypodioides</i>	resurrection fern	G5	504451	Van Horn 1981
<i>Pluchea camphorata</i>	camphor pluchea	G5	36061	NatureServe 2006
<i>Poa annua</i>	annual bluegrass	GNR	41107	Van Horn 1981
<i>Poa autumnalis</i>	autumn bluegrass	G5	41111	Van Horn 1981
<i>Poa chapmaniana</i>	Chapman's bluegrass	G5	41118	Van Horn 1981
<i>Poa cuspidata</i>	early bluegrass	G5	41122	Van Horn 1981
<i>Poa pratensis</i>	Kentucky bluegrass	G5	41088	Van Horn 1981
<i>Podophyllum peltatum</i>	mayapple	G5	18850	Van Horn 1981
<i>Polemonium reptans</i>	Greek valerian	G5	31003	Van Horn 1981
<i>Polygala verticillata</i> var. <i>isocycla</i>	whorled milkwort	G5T5	529765	NatureServe 2006
<i>Polygonatum biflorum</i>	smooth Solomon's seal	G5	43006	Van Horn 1981
<i>Polygonum aviculare</i>	prostrate knotweed	GNR	20876	Van Horn 1981
<i>Polygonum caespitosum</i> var. <i>longisetum</i>	Oriental ladythumb	GNRTNR	566299	Van Horn 1981
<i>Polygonum hydropiperoides</i>	swamp smartweed	G5	20857	NatureServe 2006
<i>Polygonum lapathifolium</i>	curlytop knotweed	G5	20860	Van Horn 1981
<i>Polygonum pennsylvanicum</i>	Pennsylvania smartweed	G5	20861	NatureServe 2006
<i>Polygonum punctatum</i>	dotted smartweed	G5	20862	Van Horn 1981
<i>Polygonum scandens</i> var. <i>cristatum</i>	climbing false buckwheat	G5T5	529790	Dickson & Nixon 1989
<i>Polygonum virginianum</i>	jumpseed	G5	20931	Dickson & Nixon 1989
<i>Polypodium virginianum</i>	rock polypody	G5	17242	Dickson & Nixon 1989
<i>Polypremum procumbens</i>	juniper leaf	G5	29959	NatureServe 2006
<i>Polystichum acrostichoides</i>	Christmas fern	G5	17675	Van Horn 1981
<i>Poncirus trifoliata</i>	hardy orange	GNR	28989	Van Horn 1981
<i>Populus alba</i>	white poplar	G5	22451	Van Horn 1981
<i>Porteranthus stipulatus</i>	>>Gillenia stipulata	G5	25284	Van Horn 1981

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Scientific Name	Common Name	GRank	TSN	Data Source
<i>Potentilla canadensis</i>	dwarf cinquefoil	G5	24698	Van Horn 1981
<i>Potentilla norvegica</i>	Norwegian cinquefoil	G5	24730	Van Horn 1981
<i>Potentilla recta</i>	sulphur cinquefoil	GNR	24742	Van Horn 1981
<i>Potentilla simplex</i>	common cinquefoil	G5	24751	Van Horn 1981
<i>Prenanthes altissima</i>	tall rattlesnakeroot	G5?	38273	Dickson & Nixon 1989
<i>Prosartes lanuginosa</i>	yellow fairybells	G5	42919	Van Horn 1981
<i>Prosartes maculata</i>	<i>Prosartes maculata</i>	G3G4	42920	Van Horn 1981
<i>Proserpinaca palustris</i>	marsh mermaidweed	G5	27049	Van Horn 1981
<i>Prunella vulgaris</i>	common selfheal	G5	32381	Van Horn 1981
<i>Prunus angustifolia</i>	Chickasaw plum	G5	24768	Van Horn 1981
<i>Prunus avium</i>	sweet cherry	GNR	24770	Van Horn 1981
<i>Prunus cerasus</i>	sour cherry	GNR	24773	NatureServe 2006
<i>Prunus pensylvanica</i>	pin cherry	G5	24799	Van Horn 1981
<i>Prunus persica</i>	peach	G5	24765	Van Horn 1981
<i>Prunus serotina</i>	black cherry	G5	24764	Van Horn 1981
<i>Prunus virginiana</i>	chokecherry	G5	24806	Van Horn 1981
<i>Pseudognaphalium obtusifolium</i> ssp. <i>obtusifolium</i>	rabbit-tobacco	G5	36694	Van Horn 1981
<i>Ptelea trifoliata</i>	common hoptree	G5	28992	Van Horn 1981
<i>Pteridium aquilinum</i>	western brackenfern	G5	17224	Van Horn 1981
<i>Pueraria montana</i> var. <i>lobata</i>	kudzu	GNRTNR	529930	Van Horn 1981; Rogers 2000
<i>Pycnanthemum incanum</i>	hoary mountainmint	G5	32662	Van Horn 1981
<i>Pycnanthemum pycnanthemoides</i>	southern mountainmint	G5	32667	NatureServe 2006
<i>Pycnanthemum tenuifolium</i>	narrowleaf mountainmint	G5	32668	NatureServe 2006
<i>Pyrus communis</i>	common pear	G5	25295	Van Horn 1981
<i>Quercus alba</i>	white oak	G5	19290	Van Horn 1981
<i>Quercus falcata</i>	southern red oak	G5	19277	Van Horn 1981
<i>Quercus lyrata</i>	overcup oak	G5	19278	Van Horn 1981
<i>Quercus marilandica</i>	blackjack oak	G5	19374	Van Horn 1981
<i>Quercus michauxii</i>	swamp chestnut oak	G5	19279	NatureServe 2006
<i>Quercus muehlenbergii</i>	chinkapin oak	G5	504714	Van Horn 1981
<i>Quercus nigra</i>	water oak	G5	19280	Van Horn 1981
<i>Quercus phellos</i>	willow oak	G5	19282	Van Horn 1981
<i>Quercus prinus</i>	chestnut oak	G5	19398	Van Horn 1981; Dickson & Nixon 1989
<i>Quercus rubra</i>	northern red oak	G5	19408	Van Horn 1981
<i>Quercus shumardii</i>	Shumard's oak	G5	19417	Van Horn 1981
<i>Quercus stellata</i>	post oak	G5	19422	Van Horn 1981

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Scientific Name	Common Name	GRank	TSN	Data Source
<i>Quercus velutina</i>	black oak	G5	19447	Dickson & Nixon 1989
<i>Ranunculus abortivus</i>	littleleaf buttercup	G5	18559	Van Horn 1981
<i>Ranunculus bulbosus</i>	St. Anthony's turnip	GNR	18594	Van Horn 1981
<i>Ranunculus fascicularis</i>	early buttercup	G5	18602	Van Horn 1981
<i>Ranunculus hispidus</i>	bristly buttercup	G5	18613	Van Horn 1981
<i>Ranunculus pusillus</i>	low spearwort	G5	18574	NatureServe 2006
<i>Ranunculus recurvatus</i>	blisterwort	G5	18641	NatureServe 2006
<i>Ranunculus sardous</i>	hairy buttercup	GNR	18645	Van Horn 1981
<i>Raphanus raphanistrum</i>	wild radish	GNR	23289	Dickson & Nixon 1989
<i>Ratibida pinnata</i>	pinnate prairie coneflower	G5	38343	Van Horn 1981
<i>Rhododendron calendulaceum</i>	flame azalea	G5	23707	Van Horn 1981
<i>Rhododendron canescens</i>	mountain azalea	G5	23712	Dickson & Nixon 1989
<i>Rhododendron cumberlandense</i>	Cumberland rhododendron	G4?	504750	Van Horn 1981
<i>Rhododendron periclymenoides</i>	pink azalea	G5	23726	Van Horn 1981
<i>Rhodotypos scandens</i>	jetbead	GNR	25298	Dickson & Nixon 1989; BONAP
<i>Rhus aromatica</i>	fragrant sumac	G5	28779	Van Horn 1981
<i>Rhus copallinum</i>	winged sumac	G5	504754	Van Horn 1981
<i>Rhus glabra</i>	smooth sumac	G5	28782	Van Horn 1981
<i>Rhynchosia tomentosa</i>	twining snoutbean	G5	504773	Van Horn 1981
<i>Ribes rotundifolium</i>	Appalachian gooseberry	G5	24497	NatureServe 2006
<i>Robinia hispida</i>	bristly locust	G4	26191	Van Horn 1981
<i>Robinia pseudoacacia</i>	black locust	G5	504804	Van Horn 1981
<i>Rosa carolina</i>	Carolina rose	G5	24808	Van Horn 1981
<i>Rosa multiflora</i>	multiflora rose	GNR	24833	Van Horn 1981; Rogers 2000
<i>Rotala ramosior</i>	lowland rotala	G5	27115	NatureServe 2006
<i>Rubus allegheniensis</i>	Allegheny blackberry	G5	24866	Van Horn 1981
<i>Rubus argutus</i>	sawtooth blackberry	G5	24877	NatureServe 2006
<i>Rubus flagellaris</i>	northern dewberry	G5	24921	Van Horn 1981
<i>Rubus occidentalis</i>	black raspberry	G5	24854	Dickson & Nixon 1989
<i>Rudbeckia fulgida</i>	orange coneflower	G5	36770	Van Horn 1981
<i>Rudbeckia hirta</i>	blackeyed Susan	G5	36765	Van Horn 1981
<i>Rudbeckia laciniata</i>	cutleaf coneflower	G5	36775	NatureServe 2006
<i>Ruellia caroliniensis</i>	Carolina wild petunia	G5	34373	Van Horn 1981

**Table 2. List of all plants historically documented at Chickamauga and Chattanooga National Military Park.**

Scientific Name	Common Name	GRank	TSN	Data Source
<i>Ruellia caroliniensis</i> var. <i>cinerascens</i>	Carolina wild petunia	G5T4?	565466	Van Horn 1981
<i>Ruellia strepens</i>	limestone wild petunia	G4G5	34390	Van Horn 1981
<i>Rumex acetosella</i>	common sheep sorrel	GNR	20934	Van Horn 1981
<i>Rumex crispus</i>	curly dock	GNR	20937	Van Horn 1981
<i>Rumex obtusifolius</i>	bitter dock	GNR	20939	Van Horn 1981
<i>Sabatia angularis</i>	rosepink	G5	30005	Van Horn 1981
<i>Saccharum alopecuroidum</i>	silver plume grass	G5	504929	Van Horn 1981; BONAP County Database
<i>Salix nigra</i>	black willow	G5	22484	Van Horn 1981
<i>Salvia lyrata</i>	lyreleaf sage	G5	32690	Van Horn 1981
<i>Salvia urticifolia</i>	nettleleaf sage	G5	32750	Van Horn 1981
<i>Sambucus nigra</i> ssp. <i>canadensis</i>	common elderberry	G5T5	35317	Van Horn 1981
<i>Sanicula canadensis</i>	Canadian blacksnakeroot	G5	29850	Van Horn 1981
<i>Sanicula odorata</i>	clustered blacksnakeroot	G5	505004	NatureServe 2006
<i>Sanicula smallii</i>	Small's blacksnakeroot	G5	29860	Van Horn 1981
<i>Sanicula trifoliata</i>	largefruit blacksnakeroot	G4	29862	NatureServe 2006
<i>Sassafras albidum</i>	sassafras	G5	18158	Van Horn 1981
<i>Saururus cernuus</i>	lizard's tail	G5	18221	NatureServe 2006
<i>Saxifraga virginensis</i>	early saxifrage	G5	24303	Van Horn 1981
<i>Schizachyrium scoparium</i>	little bluestem	G5	42076	Van Horn 1981
<i>Scirpus atrovirens</i>	green bulrush	G5?	40227	Van Horn 1981
<i>Scirpus pendulus</i>	rufous bulrush	G5	565501	Van Horn 1981
<i>Scleria oligantha</i>	littlehead nutrush	G5	40314	NatureServe 2006
<i>Scutellaria elliptica</i>	hairy skullcap	G5	32796	Van Horn 1981
<i>Scutellaria integrifolia</i>	helmet flower	G5	32801	NatureServe 2006
<i>Scutellaria montana</i>	largeflower skullcap	G3	196144	NatureServe 2006
<i>Scutellaria ovata</i>	heartleaf skullcap	G5	32772	Van Horn 1981
<i>Scutellaria parvula</i>	small skullcap	G4	32776	Van Horn 1981
<i>Scutellaria parvula</i> var. <i>missouriensis</i>	Leonard's skullcap	G4T4	566308	Van Horn 1981
<i>Scutellaria pseudoserrata</i>	false-teeth skullcap	G3	196145	NatureServe 2006
<i>Secale cereale</i>	cereal rye	GNR	42090	Van Horn 1981
<i>Sedum pulchellum</i>	widowscross	G5	24157	Van Horn 1981
<i>Sedum sarmentosum</i>	stringy stonecrop	GNR	24167	Van Horn 1981
<i>Sedum ternatum</i>	woodland stonecrop	G5	24184	Van Horn 1981

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Scientific Name	Common Name	GRank	TSN	Data Source
<i>Senna marilandica</i>	Maryland senna	G5	505160	Van Horn 1981
<i>Sericocarpus asteroides</i>	toothed whitetop aster	G5	508089	Van Horn 1981
<i>Sericocarpus linifolius</i>	narrowleaf whitetop aster	G5	508090	NatureServe 2006
<i>Setaria parviflora</i>	marsh bristlegrass	G5	505191	Van Horn 1981
<i>Sherardia arvensis</i>	blue fieldmadder	GNR	35237	Van Horn 1981
<i>Sida elliotii</i>	Elliott's fanpetals	G4G5	21736	Van Horn 1981
<i>Sida rhombifolia</i>	Cuban jute	G5	21731	Van Horn 1981
<i>Sideroxylon lycioides</i>	buckthorn bully	G5	505220	NatureServe 2006
<i>Silene rotundifolia</i>	roundleaf catchfly	G4	20114	Van Horn 1981
<i>Silene stellata</i>	widowsfrill	G5	20127	Van Horn 1981
<i>Silene virginica</i>	fire pink	G5	20141	Van Horn 1981
<i>Silphium asteriscus</i> var. <i>laevicaule</i>	starry rosinweed	G5TNR	521532	Van Horn 1981
<i>Silphium compositum</i>	kidneyleaf rosinweed	G5	38394	Van Horn 1981
<i>Silphium laciniatum</i>	compassplant	G5	38401	Van Horn 1981
<i>Silphium pinnatifidum</i>	tansy rosinweed	G3Q	38406	Sutter et al.; Van Horn 1981
<i>Silphium trifoliatum</i>	whorled rosinweed	G4?	505235	Van Horn 1981
<i>Sisymbrium officinale</i>	hedgemustard	GNR	23316	Van Horn 1981
<i>Sisyrinchium albidum</i>	white blue-eyed grass	G5?	43241	Van Horn 1981
<i>Sisyrinchium angustifolium</i>	narrowleaf blue-eyed grass	G5	43240	Van Horn 1981
<i>Sisyrinchium atlanticum</i>	eastern blue-eyed grass	G5	540674	Van Horn 1981
<i>Smilax bona-nox</i>	saw greenbrier	G5	43341	Van Horn 1981
<i>Smilax glauca</i>	cat greenbrier	G5	43342	Van Horn 1981
<i>Smilax herbacea</i>	smooth carrionflower	G5	43356	Van Horn 1981
<i>Smilax hugeri</i>	Huger's carrionflower	G4	505254	NatureServe 2006
<i>Smilax rotundifolia</i>	roundleaf greenbrier	G5	43346	Van Horn 1981
<i>Smilax tamnoides</i>	bristly greenbrier	G5	43348	Van Horn 1981
<i>Smilax walteri</i>	coral greenbrier	G5	43364	Van Horn 1981
<i>Solanum carolinense</i>	Carolina horsenettle	G5	30413	Van Horn 1981
<i>Solanum elaeagnifolium</i>	silverleaf nightshade	G4G5	30429	Van Horn 1981
<i>Solanum ptychanthum</i>	American black nightshade	G5	505270	NatureServe 2006
<i>Solidago caesia</i>	wreath goldenrod	G5	36238	Van Horn 1981
<i>Solidago canadensis</i>	Canada goldenrod	G5	36224	NatureServe 2006
<i>Solidago curtisii</i>	mountain decumbent goldenrod	G4G5	530442	NatureServe 2006
<i>Solidago erecta</i>	showy goldenrod	G5	36252	Dickson & Nixon 1989
<i>Solidago flexicaulis</i>	zigzag goldenrod	G5	36257	NatureServe 2006
<i>Solidago gigantea</i>	giant goldenrod	G5	36259	NatureServe 2006

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Scientific Name	Common Name	GRank	TSN	Data Source
<i>Solidago juncea</i>	early goldenrod	G5	36270	Van Horn 1981
<i>Solidago nemoralis</i>	gray goldenrod	G5	36281	NatureServe 2006
<i>Solidago odora</i>	anisescented goldenrod	G5	36284	NatureServe 2006
<i>Solidago sphacelata</i>	autumn goldenrod	G4G5	36312	Dickson & Nixon 1989
<i>Solidago ulmifolia</i>	elmleaf goldenrod	G5	36225	NatureServe 2006
<i>Sonchus asper</i>	spiny sowthistle	GNR	38424	Van Horn 1981
<i>Sorghastrum nutans</i>	Indiangrass	G5	42102	NatureServe 2006
<i>Sorghum halepense</i>	Johnsongrass	GNR	42111	Van Horn 1981; TNEPPC 2001
<i>Sparganium americanum</i>	American bur-reed	G5	42313	NatureServe 2006
<i>Sphenopholis intermedia</i>	slender wedgescale	G5	505324	Van Horn 1981
<i>Sphenopholis nitida</i>	shiny wedgescale	G5	41281	Van Horn 1981
<i>Spigelia marilandica</i>	woodland pinkroot	G4	505330	Van Horn 1981
<i>Spiraea japonica</i>	Japanese meadowsweet	G5	25335	Rogers 2000
<i>Spiraea prunifolia</i>	bridalwreath spirea	G5	25337	Van Horn 1981
<i>Spiraea sanssouciana</i>				Dickson & Nixon 1989
<i>Spiraea thunbergii</i>	Thunberg's meadowsweet	GNR	25341	Van Horn 1981
<i>Spiranthes lacera</i> var. <i>gracilis</i>	northern slender lady's tresses	G5T4T5	530529	Van Horn 1981
<i>Spiranthes magnicamporum</i>	Great Plains lady's tresses	G4	43468	Sutter et al.
<i>Spiranthes tuberosa</i>	little lady's tresses	G5	505346	NatureServe 2006
<i>Sporobolus clandestinus</i>	rough dropseed	G5	42117	NatureServe 2006
<i>Sporobolus heterolepis</i>	prairie dropseed	G5	42119	Sutter et al.
<i>Sporobolus vaginiflorus</i>	poverty dropseed	G5	42126	NatureServe 2006
<i>Staphylea trifolia</i>	American bladdernut	G5	28646	Van Horn 1981
<i>Stellaria media</i>	common chickweed	GNR	20169	Van Horn 1981
<i>Stellaria pubera</i>	star chickweed	G5	20193	Dickson & Nixon 1989
<i>Strophostyles umbellata</i>	pink fuzzybean	G5	26201	Van Horn 1981
<i>Stylophorum diphyllum</i>	celandine poppy	G5	18994	Van Horn 1981
<i>Stylosanthes biflora</i>	sidebeak pencilflower	G5	26973	Van Horn 1981
<i>Symphoricarpos orbiculatus</i>	coralberry	G5	35337	Van Horn 1981

**Table 2. List of all plants historically documented at Chickamauga and Chattanooga National Military Park.**

Scientific Name	Common Name	GRank	TSN	Data Source
<i>Symphotrichum cordifolium</i>	common blue wood aster	G5	522193	NatureServe 2006
<i>Symphotrichum divaricatum</i>	southern annual saltmarsh aster	G5	522198	Van Horn 1981; Dickson & Nixon 1989
<i>Symphotrichum dumosum</i> var. <i>dumosum</i>	rice button aster	G5T3T5	35511	Van Horn 1981
<i>Symphotrichum lateriflorum</i>	calico aster	G5	522220	NatureServe 2006
<i>Symphotrichum patens</i> var. <i>patens</i>	late purple aster	G5T5	35624	Van Horn 1981
<i>Symphotrichum pilosum</i> var. <i>pilosum</i>	hairy white oldfield aster	G5T5	35630	Van Horn 1981
<i>Symphotrichum pratense</i>	barrens silky aster	GNR	193276	BCD
<i>Symphotrichum sericeum</i>	western silver aster	G5	522245	Van Horn 1981
<i>Symphotrichum shortii</i>	Short's aster	G5	522246	Dickson & Nixon 1989
<i>Symphotrichum undulatum</i>	wavyleaf aster	G5	522257	NatureServe 2006
<i>Taenidia integerrima</i>	yellow pimpernel	G5	29875	Van Horn 1981
<i>Taraxacum officinale</i>	common dandelion	G5	36213	Van Horn 1981
<i>Tephrosia virginiana</i>	Virginia tephrosia	G5	26998	Van Horn 1981
<i>Thalictrum dioicum</i>	early meadow-rue	G5	18669	Van Horn 1981
<i>Thalictrum thalictroides</i>	rue anemone	G5	18683	Van Horn 1981
<i>Thaspium barbinode</i>	hairyjoint meadowparsnip	G5	29888	Dickson & Nixon 1989
<i>Thaspium pinnatifidum</i>	cutleaf meadowparsnip	G2G3	29889	Sutter et al.
<i>Thaspium trifoliatum</i>	purple meadowparsnip	G5	29890	Van Horn 1981
<i>Thaspium trifoliatum</i> var. <i>aureum</i>	purple meadowparsnip	G5T5	530637	NatureServe 2006
<i>Tiarella cordifolia</i>	heartleaf foamflower	G5	24530	NatureServe 2006
<i>Tipularia discolor</i>	crippled crane-fly	G4G5	43703	Van Horn 1981
<i>Torilis arvensis</i>	spreading hedgeparsley	GNR	29894	Van Horn 1981
<i>Toxicodendron pubescens</i>	Atlantic poison oak	G5	505545	Van Horn 1981
<i>Toxicodendron radicans</i>	eastern poison ivy	G5	28821	Van Horn 1981
<i>Tradescantia subaspera</i>	zigzag spiderwort	G5	39176	Van Horn 1981

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Scientific Name	Common Name	GRank	TSN	Data Source
<i>Tradescantia virginiana</i>	Virginia spiderwort	G5	39178	Van Horn 1981
<i>Tragia urticifolia</i>	nettleleaf noseburn	G5	28437	NatureServe 2006
<i>Trautvetteria caroliniensis</i>	Carolina bugbane	G5	18803	NatureServe 2006
<i>Trichostema dichotomum</i>	forked bluecurls	G5	32364	NatureServe 2006
<i>Tridens flavus</i>	purpletop tridens	G5	42227	Van Horn 1981
<i>Tridens strictus</i>	longspike tridens	G5	42230	NatureServe 2006
<i>Trifolium campestre</i>	field clover	GNR	26231	Van Horn 1981
<i>Trifolium incarnatum</i>	crimson clover	GNR	26262	Van Horn 1981
<i>Trifolium pratense</i>	red clover	GNR	26313	Van Horn 1981
<i>Trifolium repens</i>	white clover	GNR	26206	Van Horn 1981
<i>Trillium cuneatum</i>	little sweet Betsy	G4G5	43056	NatureServe 2006
<i>Trillium lancifolium</i>	lanceleaf wakerobin	G3	43057	NatureServe 2006
<i>Trillium luteum</i>	yellow wakerobin	G4	43077	Van Horn 1981
<i>Triodanis perfoliata</i>	clasping Venus' looking-glass	G5	530743	Van Horn 1981
<i>Triosteum angustifolium</i>	yellowfruit horse-gentian	G5	35344	NatureServe 2006
<i>Triosteum perfoliatum</i>	feverwort	G5	35345	Van Horn 1981
<i>Tripsacum dactyloides</i>	eastern gamagrass	G5	41287	NatureServe 2006
<i>Triticum aestivum</i>	common wheat	GNR	42237	Van Horn 1981
<i>Tsuga canadensis</i>	eastern hemlock	G4G5	183397	Dickson & Nixon 1989
<i>Typha latifolia</i>	broadleaf cattail	G5	42326	Van Horn 1981
<i>Ulmus alata</i>	winged elm	G5	19051	Van Horn 1981
<i>Ulmus americana</i>	American elm	G5?	19049	Van Horn 1981
<i>Ulmus rubra</i>	slippery elm	G5	19050	Van Horn 1981
<i>Uvularia perfoliata</i>	perfoliate bellwort	G5	43110	Van Horn 1981
<i>Uvularia sessilifolia</i>	sessileleaf bellwort	G5	43112	Van Horn 1981
<i>Vaccinium arboreum</i>	farkleberry	G5	23580	NatureServe 2006
<i>Vaccinium corymbosum</i>	highbush blueberry	G5	23573	Van Horn 1981
<i>Vaccinium fuscum</i>	black highbush blueberry	G5	23594	Van Horn 1981; Dickson & Nixon 1989
<i>Vaccinium pallidum</i>	Blue Ridge blueberry	G5	23610	NatureServe 2006
<i>Vaccinium stamineum</i>	deerberry	G5	23615	Van Horn 1981
<i>Valeriana pauciflora</i>	largeflower valerian	G4	35364	NatureServe 2006
<i>Valerianella radiata</i>	beaked cornsalad	G5	35397	Van Horn 1981
<i>Verbascum thapsus</i>	common mullein	GNR	33394	Van Horn 1981; Rogers 2000
<i>Verbena brasiliensis</i>	Brazilian vervain	GNR	32086	NatureServe 2006
<i>Verbena simplex</i>	narrowleaf vervain	G5	32123	Van Horn 1981

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Scientific Name	Common Name	GRank	TSN	Data Source
<i>Verbena urticifolia</i>	white vervain	G5	32127	Van Horn 1981
<i>Verbesina occidentalis</i>	yellow crownbeard	G5	38610	NatureServe 2006
<i>Verbesina virginica</i>	white crownbeard	G5?	38613	Van Horn 1981
<i>Vernonia flaccidifolia</i>	Tennessee ironweed	G4	38632	Van Horn 1981
<i>Vernonia gigantea</i>	giant ironweed	G5	38634	Van Horn 1981
<i>Veronica agrestis</i>	green field speedwell	GNR	33409	Van Horn 1981
<i>Veronica arvensis</i>	corn speedwell	GNR	33411	Van Horn 1981
<i>Veronica hederifolia</i>	ivyleaf speedwell	GNR	33418	NatureServe 2006
<i>Viburnum acerifolium</i>	mapleleaf viburnum	G5	35255	Van Horn 1981
<i>Viburnum dentatum</i>	southern arrowwood	G5	35251	Dickson & Nixon 1989
<i>Viburnum rufidulum</i>	rusty blackhaw	G5	35274	Van Horn 1981
<i>Vicia caroliniana</i>	Carolina vetch	G5	26334	Van Horn 1981
<i>Vicia sativa</i> ssp. <i>nigra</i>	garden vetch	GNRTNR	26330	Van Horn 1981
<i>Vicia villosa</i>	winter vetch	G5	26360	Van Horn 1981
<i>Vicia villosa</i> ssp. <i>varia</i>	winter vetch	G5T5	524812	Van Horn 1981
<i>Vinca major</i>	bigleaf periwinkle	GNR	30237	Van Horn 1981
<i>Vinca minor</i>	common periwinkle	GNR	30238	Van Horn 1981; Rogers 2000
<i>Viola affinis</i>	sand violet	G5	22035	Van Horn 1981
<i>Viola bicolor</i>	field pansy	G5	22047	Van Horn 1981
<i>Viola cucullata</i>	marsh blue violet	G4G5	505709	Van Horn 1981
<i>Viola egglestonii</i>	glade violet	G4	22072	Sutter et al.; Van Horn 1981
<i>Viola pedata</i>	birdfoot violet	G5	22130	Van Horn 1981
<i>Viola pubescens</i> var. <i>pubescens</i>	downy yellow violet	G5T5	530837	Van Horn 1981
<i>Viola septentrionalis</i>	northern woodland violet	G5	22169	Dickson & Nixon 1989
<i>Viola sororia</i>	common blue violet	G5	22169	NatureServe 2006
<i>Viola tripartita</i>	threepart violet	G5	22178	NatureServe 2006
<i>Viola X palmata</i>	early blue violet	GNA	22125	NatureServe 2006
<i>Vitis aestivalis</i>	summer grape	G5	28607	Van Horn 1981
<i>Vitis labrusca</i>	fox grape	G5	28608	Van Horn 1981
<i>Vitis rotundifolia</i>	muscadine	G5	28609	Van Horn 1981
<i>Vitis vulpina</i>	frost grape	G5	28610	Van Horn 1981
<i>Vulpia myuros</i>	rat-tail fescue	G5	42263	Van Horn 1981
<i>Xanthium strumarium</i>	rough cocklebur	G5	38692	NatureServe 2006
<i>Youngia japonica</i>	Oriental false hawksbeard	GNR	38704	NatureServe 2006
<i>Yucca filamentosa</i>	Adam's needle	G5	43140	Van Horn 1981
<i>Zizia aptera</i>	meadow zizia	G5	29905	Van Horn 1981
<i>Zizia aurea</i>	golden zizia	G5	29906	Van Horn 1981

**Table 3. List of all vouchers that were collected by NatureServe at Chickamauga and Chattanooga National Military Park.**

Latin Name	Common Name	Catalog No	Collector	Habitat
<i>Acalypha gracilens</i>	slender threeseed mercury	CHCH 3950	T. Govus, R. Evans	Head of ephemeral small stream floodplain
<i>Acalypha rhomboidea</i>	Virginia threeseed mercury	CHCH 3951	T. Govus, R. Evans	Lawn area near Visitor Center
<i>Acer barbatum</i>	southern sugar maple	CHCH 6337	T. Govus	Moist forest along small stream
<i>Acer saccharinum</i>	silver maple	CHCH 6338	T. Govus	Sycamore temporarily flooded forest
<i>Aesculus pavia</i>	red buckeye	CHCH 6263	T. Govus, M. Pyne	Rich white oak forest
<i>Agalinis purpurea</i>	purple false foxglove	MOBE 1	T. Govus	Old field and gas pipeline right-of-way
<i>Agrimonia pubescens</i>	soft agrimony	CHCH 3952	T. Govus, R. Evans	Lowland successional forest
<i>Alisma subcordatum</i>	American water plantain	MOBE 2	T. Govus	Small wet depressions
<i>Amaranthus spinosus</i>	spiny amaranth	CHCH 3953	T. Govus, R. Evans	Edge of horse trail near stream crossing; low wet depression.
<i>Ampelopsis cordata</i>	heartleaf peppervine	MOBE 3	T. Govus	Thicket
<i>Andropogon gyrans</i>	Elliott's bluestem	CHCH 6339	T. Govus	Pasture with gentle southerly slope
<i>Andropogon ternarius</i>	splitbeard bluestem	MOBE 4	T. Govus	Old field and gas pipeline right-of-way
<i>Anthoxanthum odoratum</i>	sweet vernalgrass	CHCH 6264	T. Govus	Grassy area by monuments
<i>Apocynum cannabinum</i>	Indianhemp	CHCH 6340	T. Govus	Red cedar - post oak woodland
<i>Arisaema dracontium</i>	greendragon	CHCH 6265	T. Govus, R. White	Bottomland with privet
<i>Aristida purpurascens</i>	arrowfeather threeawn	CHCH 3954	R. White, T. Govus, M. Pyne, T. Diggs	Grassy glade
<i>Aristolochia serpentaria</i>	Virginia snakeroot	CHCH 3955	T. Govus, R. Evans	Woodland with dense Cedar/Ash subcanopy
<i>Arthraxon hispidus</i>	small carpgrass	MOBE 5	T. Govus	Old field
<i>Asclepias hirtella</i>	green milkweed	CHCH 3956	T. Govus, R. Evans	Mowed field
<i>Asclepias verticillata</i>	whorled milkweed	CHCH 3957	R. White, T. Govus, M. Pyne, T. Diggs	Annual wet glade
<i>Asimina triloba</i>	common pawpaw	CHCH 3958	T. Govus, R. Evans	Deciduous forest dominated by <i>Quercus alba</i> - <i>Carya ovalis</i> ; very open underneath.

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Latin Name	Common Name	Catalog No	Collector	Habitat
<i>Asplenium bradleyi</i> x <i>platyneuron</i>	spleenwort hybrid	CHCH 3959	T. Govus, T. Diggs	Limestone forest beside highway
<i>Asplenium rhizophyllum</i>	walking fern	CHCH 3960	M. Pyne, R. White	Poison ivy boulderfield
<i>Astilbe biternata</i>	Appalachian false goat's beard	CHCH 6266	T. Govus	Chestnut oak forest
<i>Bidens aristosa</i>	bearded beggarticks	MOBE 6	T. Govus	Planted virginia pine forest
<i>Botrychium biternatum</i>	sparselobe grapefern	CHCH 3961	T. Govus, R. Evans	Rich Sugar maple steep slope
<i>Bouteloua curtipendula</i>	sideoats grama	CHCH 3962	T. Govus, R. Evans	Successional woodland
<i>Cannabis sativa</i>	marijuana	CHCH 3963	R. White, T. Govus, M. Pyne, T. Diggs	Grassy glade
<i>Cardamine diphylla</i>	crinkleroot	CHCH 6341	T. Govus	Rich hardwood forest
<i>Carex amphibola</i>	eastern narrowleaf sedge	CHCH 6267	T. Govus, R. White	Bottomland with privet
<i>Carex annectens</i>	yellowfruit sedge	CHCH 6268	T. Govus	Head of ephemeral small stream floodplain
<i>Carex blanda</i>	eastern woodland sedge	CHCH 6269	T. Govus	Moderately mature white oak forest on NE slope
<i>Carex cephalophora</i>	ovalleaf sedge	CHCH 6270	T. Govus	Pasture with gentle southerly slope
<i>Carex complanata</i>	blue sedge	CHCH 6271	T. Govus	Mowed field
<i>Carex glaucescens</i>	southern waxy sedge	CHCH 8274	T. Govus, T. Diggs	Willow oak limestone depression pond
<i>Carex granularis</i>	limestone meadow sedge	CHCH 6272	T. Govus, M. Pyne	Edge of trail - saturated, muddy wet area near stream crossing
<i>Carex kraliana</i>	Kral's sedge	CHCH 6342	T. Govus	Red cedar - shortleaf pine woodland
<i>Carex lucorum</i> var. <i>austrolucorum</i>	Blue Ridge sedge	CHCH 6273	T. Govus	Protected rock cliff near trail
<i>Carex lupulina</i>	hop sedge	CHCH 3964	T. Govus, R. Evans	Depression pond ringed by small disturbed forest between fields
<i>Carex muehlenbergii</i> var. <i>enervis</i>	Muhlenberg's sedge	CHCH 6274	T. Govus	Chestnut oak - hickory slope
<i>Carex nigromarginata</i>	black edge sedge	CHCH 6275	T. Govus, M. Pyne	Moderately mature white oak forest on NE slope
<i>Carex oxylepis</i>	sharpscale sedge	CHCH 6276	T. Govus, M. Pyne	Edge of trail
<i>Carex rosea</i>	rosy sedge	CHCH 6277	T. Govus, T. Diggs	Rich cove

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Latin Name	Common Name	Catalog No	Collector	Habitat
<i>Carex</i> sp.	sedge	CHCH 3965	M. Pyne, R. White	Poison ivy boulderfield
<i>Carex squarrosa</i>	squarrose sedge	CHCH 6343	T. Govus	Wet drainage in disturbed Celtis, Gleditsia woodland
<i>Carex tribuloides</i>	blunt broom sedge	MOBE 7	T. Govus	Disturbed floodplain with planted white pine
<i>Carex typhina</i>	cattail sedge	CHCH 8275	T. Govus	Willow oak limestone depression pond
<i>Carex virescens</i>	ribbed sedge	CHCH 6278	T. Govus	Moderately mature oak forest on flat ridgetop
<i>Carex willdenowii</i>	Willdenow's sedge	CHCH 6279	T. Govus, M. Pyne	Edge of trail
<i>Carya carolinae-septentrionalis</i>	southern shagbark hickory	CHCH 3966	T. Govus, R. Evans	Woodland with dense Cedar/Ash subcanopy
<i>Carya pallida</i>	sand hickory	CHCH 3967	M. Pyne, R. White	Chestnut oak - hickory slope
<i>Celtis laevigata</i>	sugarberry	CHCH 3968	T. Govus, R. Evans	Flat oak woodland with dense understory
<i>Celtis tenuifolia</i>	dwarf hackberry	CHCH 3969	T. Govus, R. Evans	Flat oak woodland with dense understory
<i>Cerastium brachypetalum</i>	gray chickweed	CHCH 6280	T. Govus, M. Pyne	Lowland successional forest
<i>Chamaesyce nutans</i>	eyebane	CHCH 3970	T. Govus, R. Evans	Open roadside bank with weedy plants.
<i>Chasmanthium laxum</i>	slender woodoats	CHCH 6344	T. Govus	Submesic southern red oak forest
<i>Chasmanthium sessiliflorum</i>	longleaf woodoats	CHCH 3971	T. Govus, R. Evans	Open edge of trail in <i>Quercus stellata</i> - <i>Pinus echinata</i> woodland.
<i>Cinna arundinacea</i>	stout woodreed	CHCH 3972	T. Govus, R. Evans	Pasture with gentle southerly slope
<i>Cladrastis kentukea</i>	Kentucky yellowwood	CHCH 8276	T. Govus	Chestnut oak forest with limestone influence
<i>Cocculus carolinus</i>	Carolina coralbead	CHCH 3973	T. Govus, R. Evans	Flat oak woodland with dense understory
<i>Collinsonia tuberosa</i>	deepwoods horsebalm	CHCH 6345	T. Govus	Rich white oak - red oak forest
<i>Collinsonia verticillata</i>	stoneroot	CHCH 6281	T. Govus, M. Pyne	Rich white oak - chestnut oak forest
<i>Conoclinium coelestinum</i>	blue mistflower	CHCH 3974	T. Govus, R. Evans	Lowland successional forest
<i>Coreopsis basalis</i>	goldenmane tickseed	CHCH 3975	T. Govus, R. Evans	Mowed field
<i>Cornus amomum</i>	silky dogwood	CHCH 6282	T. Govus	Edge of floodplain pond - seasonally inundated <i>Acer saccharinum</i> - Plat occ forest.
<i>Cornus foemina</i>	stiff dogwood	CHCH	T. Govus	Moist forest along small

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Latin Name	Common Name	Catalog No	Collector	Habitat
		6346		stream
<i>Corylus cornuta</i>	beaked hazelnut	CHCH 3976	T. Govus, R. Evans	Moderately mature white oak forest on NE slope
<i>Crataegus marshallii</i>	parsley hawthorn	CHCH 3977	T. Govus, R. Evans	Moderately mature oak forest on flat ridgetop
<i>Crataegus pedicellata</i>	scarlet hawthorn	CHCH 3978	T. Govus, R. Evans	Open roadside bank with weedy plants.
<i>Croton glandulosus</i>	vente conmigo	CHCH 3979	R. White, T. Govus, M. Pyne, T. Diggs	Roadside
<i>Cryptotaenia canadensis</i>	Canadian honewort	CHCH 6347	T. Govus	Rich, mesic hardwoods along edge of narrow floodplain
<i>Cunila organoides</i>	common dittany	CHCH 3980	M. Pyne, R. White	Chestnut oak - hickory slope
<i>Cuscuta gronovii</i>	scaldweed	MOBE 8	T. Govus	Small wet depressions
<i>Cyperus esculentus</i>	chufa flatsedge	CHCH 6348	T. Govus	Wet drainage in disturbed <i>Celtis</i> , <i>Gleditsia</i> woodland
<i>Cyperus lupulinus</i>	Great Plains flatsedge	CHCH 3981	T. Govus, R. Evans	Pasture with gentle southerly slope
<i>Cyperus retrofractus</i>	rough flatsedge	MOBE 9	T. Govus	Mature chestnut oak but with loblolly & sweetgum
<i>Cyperus retrorsus</i>	pine barren flatsedge	CHCH 3982	T. Govus, R. Evans	Pasture with gentle southerly slope
<i>Cypripedium acaule</i>	pink lady's slipper	CHCH 3983	T. Govus, R. Evans	Head of ephemeral small stream floodplain
<i>Desmodium ciliare</i>	littleleaf tickclover	CHCH 3984	R. White, T. Govus, M. Pyne, T. Diggs	Annual wet glade
<i>Desmodium obtusum</i>	stiff ticktrefoil	MOBE 10	T. Govus	Edge of gas pipeline right-of-way
<i>Desmodium paniculatum</i>	panickedleaf ticktrefoil	CHCH 3985	T. Govus, R. Evans	Open roadside bank with weedy plants.
<i>Desmodium rotundifolium</i>	prostrate ticktrefoil	CHCH 6349	T. Govus	Woodland with dense Cedar/Ash subcanopy
<i>Dichanthelium acuminatum</i> var. <i>fasciculatum</i>	western panicgrass	CHCH 3986	R. White, T. Govus, M. Pyne, T. Diggs	Grassy glade
<i>Dichanthelium clandestinum</i>	deertongue	MOBE 11	T. Govus	Edge of gas pipeline right-of-way
<i>Dichanthelium commutatum</i>	variable panicgrass	CHCH 3987	T. Govus, R. Evans	Successional Cedar/Oak/Hickory forest

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Latin Name	Common Name	Catalog No	Collector	Habitat
<i>Dichanthelium depauperatum</i>	starved panicgrass	CHCH 4028	R. White, T. Govus, M. Pyne, T. Diggs	Grassy glade
<i>Dichanthelium ensifolium</i>	cypress rosette grass	CHCH 3988	M. Pyne, R. White	Poison ivy boulderfield
<i>Dichanthelium meridionale</i>	matting rosette grass	CHCH 3989	M. Pyne, R. White	Poison ivy boulderfield
<i>Dichanthelium sphaerocarpon</i>	roundseed panicgrass	CHCH 3990	T. Govus, R. Evans	Woodland with dense Cedar/Ash subcanopy
<i>Dichanthelium sphaerocarpon</i> var. <i>isophyllum</i>	roundseed panicum	CHCH 3991	R. White, T. Govus, M. Pyne, T. Diggs	Annual wet glade
<i>Dichondra carolinensis</i>	grass ponyfoot	CHCH 3992	T. Govus, R. Evans	Pine/Oak/Hickory forest
<i>Digitaria sanguinalis</i>	hairy crabgrass	MOBE 12	T. Govus	Successional forest with exotics
<i>Diodia teres</i>	poorjoe	CHCH 3993	T. Govus, R. Evans	Mowed field
<i>Dioscorea quaternata</i>	fourleaf yam	CHCH 3994	T. Govus, R. Evans	Moderately mature white oak forest on NE slope
<i>Doellingeria umbellata</i>	parasol whitetop	CHCH 3995	M. Pyne, R. White	Dry Chestnut oak/Virginia pine forest
<i>Echinochloa crus-galli</i>	barnyardgrass	CHCH 3996	T. Govus, R. Evans	Depression pond ringed by small disturbed forest between fields
<i>Eclipta prostrata</i>	false daisy	MOBE 33	T. Govus	Manmade seasonally flooded wetland
<i>Eleocharis obtusa</i>	blunt spikesedge	CHCH 3997	T. Govus, R. Evans	Depression pond ringed by small disturbed forest between fields
<i>Elephantopus carolinianus</i>	Carolina elephantsfoot	CHCH 3998	T. Govus, R. Evans	Black walnut/Red cedar mossy glade
<i>Eleusine indica</i>	Indian goosegrass	MOBE 13	T. Govus	Successional forest with exotics
<i>Elymus hystrix</i>	eastern bottlebrush grass	CHCH 3999	T. Govus, R. Evans	Mature Oak/Hickory forest
<i>Eragrostis spectabilis</i>	purple lovegrass	CHCH 4000	T. Govus, R. Evans	Pasture with gentle southerly slope
<i>Euonymus fortunei</i>	winter creeper	CHCH 4001	T. Diggs, T. Govus	White oak/hickory stand
<i>Eupatorium capillifolium</i>	dogfennel	CHCH 4002	T. Govus, M. Pyne	Glade.
<i>Eupatorium hyssopifolium</i>	hyssopleaf thoroughwort	MOBE 14	T. Govus	Successional forest with exotics

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Latin Name	Common Name	Catalog No	Collector	Habitat
<i>Eupatorium perfoliatum</i>	common boneset	MOBE 15	T. Govus	Old field and gas pipeline right-of-way
<i>Eupatorium sessilifolium</i>	upland boneset	CHCH 4003	M. Pyne	Rich dry woods - upper slope
<i>Euphorbia pubentissima</i>	false flowering spurge	CHCH 4004	T. Govus, R. Evans	Mowed field
<i>Festuca subverticillata</i>	nodding fescue	CHCH 6283	T. Govus	Mature Oak/Hickory forest
<i>Fleischmannia incarnata</i>	pink thoroughwort	CHCH 4005	T. Govus, M. Pyne	Glade.
<i>Fraxinus pennsylvanica</i>	green ash	CHCH 4006	T. Govus, R. Evans	Depression pond ringed by small disturbed forest between fields
<i>Galactia volubilis</i>	downy milkpea	CHCH 4007	R. White, T. Govus, M. Pyne, T. Diggs	Grassy glade
<i>Galium circaezans</i>	licorice bedstraw	CHCH 4066	T. Govus	Successional Cedar/Oak/Hickory forest
<i>Galium circaezans</i>	licorice bedstraw	CHCH 6350	T. Govus	Red cedar - shortleaf pine woodland
<i>Galium obtusum</i>	bluntleaf bedstraw	CHCH 4008	T. Govus, R. Evans	Black walnut/Red cedar mossy glade
<i>Galium obtusum</i> ssp. <i>obtusum</i>	bluntleaf bedstraw	CHCH 6351	T. Govus	Rich, mesic hardwoods along edge of narrow floodplain
<i>Geum vernum</i>	spring avens	CHCH 6284	T. Govus	Grassy area by monuments
<i>Glyceria melicaria</i>	melic mannagrass	CHCH 6285	T. Govus, R. White	Rich cove
<i>Glyceria striata</i>	fowl mannagrass	CHCH 6286	T. Govus	Head of ephemeral small stream floodplain
<i>Helenium flexuosum</i>	purplehead sneezeweed	CHCH 4009	T. Govus, R. Evans	Mowed field
<i>Helianthus angustifolius</i>	swamp sunflower	MOBE 16	T. Govus	Old field and gas pipeline right-of-way
<i>Heterotheca subaxillaris</i>	camphorweed	MOBE 17	T. Govus	Old field and gas pipeline right-of-way
<i>Houstonia caerulea</i>	azure bluets	CHCH 6287	T. Govus, M. Pyne	Flat oak woodland with dense understory
<i>Hymenocallis caroliniana</i>	Carolina spiderlily	CHCH 6352	T. Govus	Sycamore temporarily flooded forest
<i>Hypericum drummondii</i>	nits and lice	CHCH 4010	T. Govus, R. Evans	Pasture with gentle southerly slope
<i>Hypericum hypericoides</i> ssp. <i>multicaule</i>	St. Andrew's cross	CHCH 6353	T. Govus	Sandstone cliff
<i>Ilex cornuta</i>	Chinese holly	CHCH 4011	T. Govus, R. Evans	Flat oak woodland with dense understory

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Latin Name	Common Name	Catalog No	Collector	Habitat
<i>Ilex decidua</i>	possumhaw	CHCH 4012	T. Govus, R. Evans	Pine/Oak woodland with dense understory
<i>Ipomoea purpurea</i>	tall morning-glory	MOBE 18	T. Govus	Old field and gas pipeline right-of-way
<i>Krigia caespitosa</i>	weedy dwarf dandelion	CHCH 6288	T. Govus	Pasture with gentle southerly slope
<i>Krigia virginica</i>	Virginia dwarf dandelion	CHCH 6289	T. Govus, M. Pyne	Trail edge
<i>Lactuca serriola</i>	prickly lettuce	CHCH 6290	T. Govus, M. Pyne	Edge of road
<i>Laportea canadensis</i>	Canadian woodnettle	CHCH 6354	T. Govus	Rich, mesic hardwoods along edge of narrow floodplain
<i>Leavenworthia exigua</i> var. <i>exigua</i>	Tennessee gladecress	CHCH 6291	T. Govus, M. Pyne	Annual wet glade
<i>Leersia oryzoides</i>	rice cutgrass	CHCH 6355	T. Govus	Depression pond ringed by small disturbed forest between fields
<i>Leersia virginica</i>	whitegrass	CHCH 4013	T. Govus, R. Evans	Dry, open road edge through pine-oak forest; mostly herbaceous dominated by <i>Danthonia</i> .
<i>Lespedeza procumbens</i>	trailing lespedeza	CHCH 4014	T. Govus, R. Evans	Dry, open road edge through pine-oak forest; mostly herbaceous dominated by <i>Danthonia</i> .
<i>Lespedeza repens</i>	creeping lespedeza	CHCH 4015	R. White, T. Govus, M. Pyne, T. Diggs	Annual wet glade
<i>Leucospora multifida</i>	narrowleaf paleseed	CHCH 4016	T. Govus, R. Evans	Edge of horse trail near stream crossing; low wet depression.
<i>Lobelia inflata</i>	Indian tobacco	CHCH 4017	T. Govus, R. Evans	Moderately mature white oak forest on NE slope
<i>Lolium arundinaceum</i>	tall ryegrass	CHCH 6292	T. Govus	Mowed field
<i>Ludwigia palustris</i>	marsh seedbox	CHCH 4019	T. Govus, R. Evans	Depression pond ringed by small disturbed forest between fields
<i>Lycopus rubellus</i>	taperleaf water horehound	MOBE 19	T. Govus	Manmade seasonally flooded wetland
<i>Lysimachia nummularia</i>	creeping jenny	CHCH 6293	T. Govus, M. Pyne	Pasture with gentle southerly slope
<i>Macrothelypteris torresiana</i>	swordfern	MOBE 20	T. Govus	Mesic ravine in white oak - black oak forest
<i>Menispermum canadense</i>	common moonseed	CHCH 6294	T. Govus	Edge of floodplain pond - seasonally inundated <i>Acer saccharinum</i> - Plat occ forest.

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Latin Name	Common Name	Catalog No	Collector	Habitat
<i>Mercurialis annua</i>	annual mercury	CHCH 4020	T. Govus, R. Evans	Edge of horse trail near stream crossing; low wet depression.
<i>Minuartia patula</i>	pitcher's stitchwort	CHCH 6295	T. Govus, M. Pyne	Flat oak woodland with dense understory
<i>Mirabilis jalapa</i>	common four o'clock	CHCH 4021	T. Govus, R. Evans	Open roadside bank with weedy plants.
<i>Mollugo verticillata</i>	green carpetweed	MOBE 21	T. Govus	Old field and gas pipeline right-of-way
<i>Morus alba</i>	mulberry	CHCH 4022	T. Govus, R. Evans	Open roadside bank with weedy plants.
<i>Mosla dianthera</i>	miniature beefsteakplant	CHCH 4023	T. Govus, R. Evans	Dry, open road edge through pine-oak forest; mostly herbaceous dominated by <i>Danthonia</i> .
<i>Muhlenbergia schreberi</i>	nimblewill	CHCH 4024	T. Govus, R. Evans	Dry, open road edge through pine-oak forest; mostly herbaceous dominated by <i>Danthonia</i> .
<i>Muhlenbergia sobolifera</i>	rock muhly	CHCH 4025	T. Govus, R. Evans	Successional Cedar/Oak/Hickory forest
<i>Murdannia keisak</i>	wartremoving herb	MOBE 22	T. Govus	Old field and gas pipeline right-of-way
<i>Nuttallanthus canadensis</i>	Canada toadflax	CHCH 6296	T. Govus, M. Pyne	Pasture with gentle southerly slope
<i>Onoclea sensibilis</i>	sensitive fern	CHCH 6297	T. Govus	Edge of floodplain pond - seasonally inundated <i>Acer saccharinum</i> - Plat occ forest.
<i>Ostrya virginiana</i>	eastern hophornbeam	CHCH 4026	T. Govus, R. Evans	Rich Sugar maple steep slope
<i>Packera paupercula</i>	balsam groundsel	CHCH 6356	T. Govus	Dolomite glade dominated by <i>Sporobolus vaginiflorus</i>
<i>Panicum capillare</i>	panicgrass	CHCH 4027	T. Govus, R. Evans	Edge of horse trail near stream crossing; low wet depression.
<i>Panicum dichotomiflorum</i>	fall panicgrass	MOBE 23	T. Govus	Successional forest with exotics
<i>Panicum gattingeri</i>	Gattinger's panicgrass	MOBE 24	T. Govus	Manmade seasonally flooded wetland
<i>Panicum virgatum</i>	switchgrass	CHCH 4029	R. White, T. Govus, M. Pyne, T. Diggs	Grassy glade
<i>Panicum??</i>	panicgrass	MOBE 32	T. Govus	White pine floodplain of TN River
<i>Paspalum laeve</i>	field paspalum	CHCH 4030	R. White, T. Govus, M. Pyne, T. Diggs	Grassy glade

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<i>Paspalum pubiflorum</i> var. <i>glabrum</i>	hairyseed paspalum	CHCH 4031	R. White, T. Govus, M. Pyne, T. Diggs	Roadside
<i>Passiflora incarnata</i>	purple passionflower	CHCH 4032	T. Govus, R. Evans	Mowed field
<i>Pennisetum glaucum</i>	pearl millet	CHCH 4033	T. Govus, R. Evans	Pasture with gentle southerly slope
<i>Penthorum sedoides</i>	ditch stonecrop	CHCH 4034	T. Govus, R. Evans	Successional Cedar/Oak/Hickory forest
<i>Perilla frutescens</i>	purple mint	CHCH 4035	T. Govus, R. Evans	Edge of horse trail near stream crossing; low wet depression.
<i>Phlox amplifolia</i>	largeleaf phlox	CHCH 6357	T. Govus	Rich cove
<i>Physalis angulata</i>	cutleaf groundcherry	CHCH 4036	T. Govus, R. Evans	Edge of horse trail near stream crossing; low wet depression.
<i>Physalis virginiana</i>	Virginia groundcherry	CHCH 4037	R. White, T. Govus, M. Pyne, T. Diggs	Grassy glade
<i>Pilea pumila</i>	Canadian clearweed	MOBE 25	T. Govus	Gas pipeline right-of-way
<i>Pluchea camphorata</i>	camphor pluchea	CHCH 4038	T. Govus, M. Pyne	Glade.
<i>Polygala verticillata</i> var. <i>isocycla</i>	whorled milkwort	CHCH 6298	T. Govus	Perennial grass limestone glade
<i>Polygonum hydropiperoides</i>	swamp smartweed	CHCH 4039	T. Govus, R. Evans	Depression pond ringed by small disturbed forest between fields
<i>Polygonum pensylvanicum</i>	Pennsylvania smartweed	MOBE 26	T. Govus	Small wet depressions
<i>Polypremum procumbens</i>	juniper leaf	MOBE 27	T. Govus	Old field adjacent gas pipeline right-of-way
<i>Prunus cerasus</i>	sour cherry	CHCH 4040	M. Pyne, R. White	Poison ivy boulderfield
<i>Pycnanthemum pycnanthemoides</i>	southern mountainmint	CHCH 4041	T. Govus, R. Evans	Moderately mature white oak forest on NE slope
<i>Pycnanthemum tenuifolium</i>	narrowleaf mountainmint	CHCH 4042	T. Govus, R. Evans	Open edge of dry <i>Quercus stellata</i> - <i>Pinus echinata</i> woodland.
<i>Quercus michauxii</i>	swamp chestnut oak	CHCH 6299	T. Govus, T. Diggs	Floodplain of Lookout Creek - <i>Celt laev</i> , <i>Acer rub</i> , <i>Liri tul</i>
<i>Ranunculus pusillus</i>	low spearwort	CHCH 6300	T. Govus, M. Pyne	Depression pond ringed by small disturbed forest between fields
<i>Ranunculus recurvatus</i>	blisterwort	CHCH 6358	T. Govus	Rich hardwood forest

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<i>Ribes rotundifolium</i>	Appalachian gooseberry	CHCH 6301	T. Govus, M. Pyne	White oak/hickory stand
<i>Rotala ramosior</i>	lowland rotala	MOBE 28	T. Govus	Small wet depressions
<i>Rubus argutus</i>	sawtooth blackberry	CHCH 4043	R. White, T. Govus, M. Pyne, T. Diggs	Grassy glade
<i>Rudbeckia laciniata</i>	cutleaf coneflower	CHCH 6359	T. Govus	Sycamore temporarily flooded forest
<i>Sanicula odorata</i>	clustered blacksnakeroot	CHCH 6302	T. Govus, T. Diggs	Bottomland with privet
<i>Sanicula trifoliata</i>	largefruit blacksnakeroot	CHCH 6303	T. Govus, T. Diggs	Floodplain of Lookout Creek - Liquefy, Cary cord, Carp car
<i>Saururus cernuus</i>	lizard's tail	CHCH 8277	R. Seavey	Temporarily flooded bottomland hardwood forest with <i>Quercus lyrata</i>
<i>Scleria oligantha</i>	littlehead nutrush	CHCH 4044	T. Govus, R. Evans	Black walnut/Red cedar mossy glade
<i>Scutellaria integrifolia</i>	helmet flower	CHCH 4045	T. Govus, R. Evans	Dry Post oak/White oak upland
<i>Scutellaria montana</i>	largeflower skullcap	CHCH 6304	T. Govus, M. Pyne	White oak/hickory stand
<i>Scutellaria pseudoserrata</i>	false-teeth skullcap	CHCH 6305	T. Govus, M. Pyne	Chestnut oak forest
<i>Sericocarpus linifolius</i>	narrowleaf whitetop aster	CHCH 4046	R. White, T. Govus, M. Pyne, T. Diggs	Grassy glade
<i>Sideroxylon lycioides</i>	buckthorn bully	CHCH 4047	T. Govus, R. Evans	Woodland with dense Cedar/Ash subcanopy
<i>Smilax hugeri</i>	Huger's carrionflower	CHCH 6306	T. Govus	Moderately mature white oak forest on NE slope
<i>Solanum ptychanthum</i>	black nightshade	CHCH 4048	T. Govus, R. Evans	Successional Cedar/Oak/Hickory forest
<i>Solidago caesia</i> var. <i>curtisii</i>	mountain decumbent goldenrod	CHCH 6360	T. Govus	Submesic white oak - chestnut oak forest
<i>Solidago canadensis</i>	Canada goldenrod	CHCH 4049	R. White, T. Govus, M. Pyne, T. Diggs	Annual wet glade
<i>Solidago flexicaulis</i>	zigzag goldenrod	CHCH 6361	T. Govus	Rich mesic hardwood
<i>Solidago gigantea</i>	giant goldenrod	CHCH 4050	T. Govus, R. Evans	Mowed field

**Table 3. List of all vouchers that were collected by NatureServe at Chickamauga and Chattanooga National Military Park.**

Latin Name	Common Name	Catalog No	Collector	Habitat
<i>Solidago nemoralis</i>	Dyersweed goldenrod	CHCH 4051	R. White, T. Govus, M. Pyne, T. Diggs	Grassy glade
<i>Solidago odora</i>	anisescented goldenrod	CHCH 4052	T. Govus, R. Evans	Head of ephemeral small stream floodplain
<i>Solidago ulmifolia</i>	elmleaf goldenrod	CHCH 6362	T. Govus	Submesic white oak - chestnut oak forest
<i>Sorghastrum nutans</i>	yellow Indiangrass	CHCH 4053	T. Govus, M. Pyne	Glade.
<i>Sparganium americanum</i>	American burreed	CHCH 4054	T. Govus, R. Evans	Depression pond ringed by small disturbed forest between fields
<i>Spiranthes tuberosa</i>	little ladies'-tresses	CHCH 6363	T. Govus	Edge of rich bluff
<i>Sporobolus clandestinus</i>	rough dropseed	CHCH 4055	T. Govus, M. Pyne	Glade.
<i>Sporobolus vaginiflorus</i>	poverty dropseed	CHCH 4056	R. White, T. Govus, M. Pyne, T. Diggs	Annual wet glade
<i>Symphyotrichum cordifolium</i>	common blue wood aster	CHCH 4057	M. Pyne	Rich dry woods - upper slope
<i>Symphyotrichum lateriflorum</i>	calico aster	CHCH 6364	T. Govus	Submesic white oak - chestnut oak forest
<i>Symphyotrichum undulatum</i>	waxleaf aster	CHCH 4058	T. Govus, R. Evans	Woodland with dense Cedar/Ash subcanopy
<i>Thaspium trifoliatum</i> var. <i>aureum</i>	purple meadowparsnip	CHCH 6365	T. Govus	Edge of road
<i>Tiarella cordifolia</i>	heartleaf foamflower	CHCH 6366	T. Govus	Rich cove
<i>Tragia urticifolia</i>	nettleleaf noseburn	CHCH 4059	R. White, T. Govus, M. Pyne, T. Diggs	Grassy glade
<i>Trautvetteria caroliniensis</i>	Carolina bugbane	CHCH 4060	M. Pyne	Boulder (seep) area with <i>Actaea racemosa</i> and <i>Maianthemum racemosum</i> .
<i>Trichostema dichotomum</i>	forked bluecurls	MOBE 29	T. Govus	Old field adjacent gas pipeline right-of-way
<i>Tridens strictus</i>	longspike tridens	CHCH 4061	T. Govus, R. Evans	Mowed field
<i>Trillium cuneatum</i>	little sweet Betsy	CHCH 6307	T. Govus, R. White	Acid Chestnut oak woodland
<i>Trillium lancifolium</i>	lanceleaf wakerobin	CHCH 6308	T. Govus, R. White	Rich cove-like area and adjacent roadside

**Table 3. List of all vouchers that were collected by NatureServe at Chickamauga and Chattanooga National Military Park.**

Latin Name	Common Name	Catalog No	Collector	Habitat
<i>Triosteum angustifolium</i>	yellowfruit horsegentian	CHCH 6309	T. Govus, M. Pyne	Woodland with dense Cedar/Ash subcanopy
<i>Tripsacum dactyloides</i>	eastern gramagrass	CHCH 4062	T. Govus, R. Evans	Pasture with gentle southerly slope
<i>Vaccinium arboreum</i>	tree sparkleberry	CHCH 4063	T. Govus, R. Evans	Depression pond ringed by small disturbed forest between fields
<i>Vaccinium pallidum</i>	Blue Ridge blueberry	CHCH 6367	T. Govus	Moderately mature white oak forest on NE slope
<i>Valeriana pauciflora</i>	largeflower valerian	CHCH 4064	T. Govus, R. Evans	Pasture with gentle southerly slope
<i>Verbena brasiliensis</i>	Brazilian vervain	MOBE 30	T. Govus	Planted virginia pine forest
<i>Verbesina occidentalis</i>	yellow crownbeard	CHCH 6368	T. Govus	Submesic southern red oak forest
<i>Veronica hederifolia</i>	ivyleaf speedwell	CHCH 6310	T. Govus, R. White	Rich mesic forest with some calciphilic plants ( <i>Phacelia</i> <i>bipinnatifida</i> , <i>Stylophorum</i> <i>diphyllum</i> )
<i>Viola palmata</i>	early blue violet	CHCH 6311	T. Govus, M. Pyne	Flat oak woodland with dense understory
<i>Viola sororia</i>	common blue violet	CHCH 4065	T. Govus, R. Evans	Open roadside bank with weedy plants.
<i>Viola tripartita</i>	threepart violet	CHCH 6312	T. Govus, R. White	Rich cove-like area and adjacent roadside
<i>Viola tripartita</i>	threepart violet	CHCH 6369	T. Govus	Moderately mature white oak forest on NE slope
<i>Xanthium strumarium</i>	rough cockleburr	MOBE 31	T. Govus	Disturbed floodplain with planted white pine
<i>Youngia japonica</i>	oriental false hawksbeard	CHCH 6313	T. Govus, M. Pyne	Trail's edge in calcareous forest

**Table 4. Table of vascular plant diversity measures and species total estimates for Chickamauga and Chattanooga National Military Park.**

	Diversity Measures			
	N	alpha	beta	Gamma
Gridded full plots only	30	63.5	8.1	512
All full plots	49	61.4	10.3	632
Total for park				880

alpha = average species richness per plot

beta = measure of the heterogeneity of the data (gamma/alpha)

gamma = total species for all plots or for park

	Estimate of # of species in park	If estimate is correct, % of species confirmed for park (based on 880 species confirmed)
First-order jackknife estimate (all plots)	846	104%
Second-order jackknife estimate (all plots)	944	93%
First-order jackknife estimate (gridded plots)	704	125%
Second-order jackknife estimate (gridded plots)	807	109%

**Table 5. Exotic plant species at Chickamauga and Chattanooga National Military Park.**

Latin Name	CommonName	TSN	Threat?	Source
<i>Ailanthus altissima</i>	Tree-of-heaven	28827	Severe Threat	Georgia Exotic Pest Plant Council 2006
<i>Albizia julibrissin</i>	silk tree	26449	Severe Threat	Georgia Exotic Pest Plant Council 2006
* <i>Alliaria petiolata</i>	garlic mustard	184481	Severe Threat	Tennessee Exotic Pest Plants Council 2004
<i>Allium vineale</i>	field garlic	42637	Minor Threat	Georgia Exotic Pest Plant Council 2006
<i>Arthraxon hispidus</i>	small carpgrass	41445	Threat	Southern Weed Science Society 1998
<i>Berberis thunbergii</i>	Japanese barberry	18835	Significant Threat	Tennessee Exotic Pest Plants Council 2004
<i>Bromus commutatus</i>	Japanese brome	40479	Significant Threat	Tennessee Exotic Pest Plants Council 2004
<i>Buglossoides arvensis</i>	corn gromwell	501090	Lesser Threat	Tennessee Exotic Pest Plants Council 2004
<i>Buxus sempervirens</i>	common box	501097	Lesser Threat	USDA Plants Database 2006
<i>Cardamine hirsuta</i>	hairy bittercress	22797		
<i>Castanea mollissima</i>	Chinese chestnut	501318		
<i>Celastrus orbiculata</i>	Asian bittersweet	506068	Severe Threat	Tennessee Exotic Pest Plants Council 2004
<i>Clematis terniflora</i>	Autumn clematis	511125	Significant Threat	Tennessee Exotic Pest Plants Council 2004
<i>Cerastium glomeratum</i>	sticky mouse-ear chickweed	19955	Minor Threat	Southern Weed Science Society 1998
<i>Commelina communis</i>	Asiatic dayflower	39127	Threat	Southern Weed Science Society 1998
<i>Conringia orientalis</i>	Hare's-ear Mustard	23103		Weakly 2006
<i>Dactylis glomerata</i>	orchardgrass	193446		
<i>Daucus carota</i>	Queen Anne's lace	29477	Significant Threat	Tennessee Exotic Pest Plants Council 2004
<i>Digitaria ischaemum</i>	smooth crabgrass	40637		Southern Weed Science Society 1998
<i>Dioscorea oppositifolia</i>	Chinese yam	502075	Threat	Southern Weed Science Society 1998
<i>Elaeagnus pungens</i>	Thorny-olive	502223	Severe Threat	Tennessee Exotic Pest Plants Council 2004
<i>Euonymus alata</i>	burning bush	27946	Significant Threat	Tennessee Exotic Pest Plants Council 2004
<i>Euonymus fortunei</i>	wintercreeper	27950	Significant Threat	Georgia Exotic Pest Plant Council 2006

\* reported for site by Rogers 2000 but with no verification, should be looked for and reported as threat.

**Table 5. Exotic plant species at Chickamauga and Chattanooga National Military Park.**

Latin Name	CommonName	TSN	Threat?	Source
<i>Galinsoga quadriradiata</i>	shaggy soldier	37415	Significant Threat	Govus 2006
<i>Hedera helix</i>	English ivy	29393	Severe Threat	Tennessee Exotic Pest Plants Council 2004
<i>Hypochaeris radicata</i>	spotted catsear	37794	Threat	Kartesz 1999
<i>Kummerowia striata</i>	Japanese clover	503294	Lesser Threat	Tennessee Exotic Pest Plants Council 2001
<i>Lagerstroemia indica</i>	crape myrtle	27110	Lesser Threat	Govus 2006
<i>Lamium amplexicaule</i>	henbit	32539	Minor Threat	Southern Weed Science Society, Weeds of the United States and Canada
<i>Lespedeza cuneata</i>	Chinese lespedeza	25898	Severe Threat	Tennessee Exotic Pest Plants Council 2004
<i>Leucanthemum vulgare</i>	ox-eye daisy	37903	Lesser Threat	Tennessee Exotic Pest Plants Council 2004
<i>Ligustrum sinense</i>	Chinese privet	32979	Severe Threat	Tennessee Exotic Pest Plants Council 2001; Miller 1996
<i>Ligustrum vulgare</i>	European privet	32980	Severe Threat	Tennessee Exotic Pest Plants Council 2004
<i>Lolium perenne</i> ssp. <i>multiflorum</i>	Italian ryegrass	524260		
<i>Lonicera japonica</i>	Japanese honeysuckle	35283	Severe Threat	Tennessee Exotic Pest Plants Council 2004
<i>Lonicera fragrantissima</i>	January jasmine	35293	Severe Threat	Tennessee Exotic Pest Plants Council 2004
<i>Lonicera maackii</i>	Amur bush honeysuckle	35298	Severe Threat	Tennessee Exotic Pest Plants Council 2004
<i>Lysimachia nummularia</i>	moneywort	23993	Significant Threat	Tennessee Exotic Pest Plants Council 2004
<i>Macrothelypteris torresiana</i>	swordfern	503649	Significant Threat	Govus 2006
<i>Melilotus officinalis</i>	yellow sweet-clover	26150	Significant Threat	Tennessee Exotic Pest Plants Council 2004
<i>Microstegium vimineum</i>	Nepalese browntop	503829	Severe Threat	Tennessee Exotic Pest Plants Council 20014
<i>Mirabilis jalapa</i>	common four o'clock	19648		
<i>Mosla dianthera</i>	miniature beefsteakplant	32621	Minor Threat	Georgia Exotic Pest Plant Council 2006
<i>Nepeta cataria</i>	catnip	326223	Minor Threat	Govus 2006
<i>Narcissus pseudonarcissus</i>	daffodil	503930		
<i>Paulownia tomentosa</i>	princesstree	33460	Severe Threat	Tennessee Exotic Pest Plants Council 2004
<i>Perilla frutescens</i>	beefsteakplant	32634	Minor Threat	Southern Weed Science Society 1998

**Table 5. Exotic plant species at Chickamauga and Chattanooga National Military Park.**

Latin Name	CommonName	TSN	Threat?	Source
<i>Phleum pratense</i>	timothy	41062	Minor Threat	Govus 2006
<i>Poa annua</i>	annual bluegrass	41107	Lesser Threat	
<i>Polygonum cespitosum</i> var. <i>longisetum</i>	creeping smartweed	529778	Significant Threat	Tennessee Exotic Pest Plants Council 2004
<i>Pueraria montana</i> var. <i>lobata</i>	kudzu	529930	Severe Threat	Tennessee Exotic Pest Plants Council 2004
<i>Ranunculus sardous</i>	hairy buttercup	18645	Minor Threat	Southern Weed Science Society 1998
<i>Rosa multiflora</i>	multiflora rose	24833	Severe Threat	Tennessee Exotic Pest Plants Council 2002
<i>Rosa wichuraiana</i>	memorial rose	24846		
<i>Rumex crispus</i>	curly dock	20937	Minor Threat	Southern Weed Science Society 1998
<i>Rumex obtusifolius</i>	bitter dock	20939		
<i>Sherardia arvensis</i>	green bristlegrass	35237		Wofford 1989
<i>Sonchus asper</i>	sow thistle	38424		Wofford 1989
<i>Sorghum halepense</i>	Johnson grass	42111	Severe Threat	Tennessee Exotic Pest Plants Council 2004
<i>Spiraea japonica</i>	Japanese spiraea	25335	Significant Threat	Govus 2006
<i>Stellaria media</i>	common chickweed	20169	Minor Threat	Southern Weed Science Society 1998
<i>Taraxacum officinale</i>	common dandelion	36213	Minor Threat	Southern Weed Science Society 1998
<i>Trifolium pratense</i>	red clover	26313	Minor Threat	
<i>Trifolium repens</i>	white clover	26206	Minor Threat	
<i>Triticum aestivum</i>	common wheat	42237	Minor Threat	
<i>Veronica hederifolia</i>	ivyleaf speedwell	33418	Minor Threat	Tennessee Exotic Pest Plants Council 2004
<i>Veronica persica</i>	birdeye speedwell	33405	Minor Threat	
<i>Vicia sativa</i> ssp. <i>nigra</i>	garden vetch	524809	Significant Threat	Tennessee Exotic Pest Plants Council 2001
<i>Vinca minor</i>	common periwinkle	30238	Significant Threat	Tennessee Exotic Pest Plants Council 2001
<i>Vinca major</i>	bingleaf periwinkle	30237	Moderate Threat	Georgia Exotic Pest Plant Council 2006
<i>Youngia japonica</i>	Oriental false hawksbeard	38704	Significant Threat	Govus 2006

**Table 6. Association Global Element Codes (e.g. last 4 digits of C EGL007178), plot numbers, and global ranks of all associations identified and potentially occurring at Chickamauga and Chattanooga National Military Park.**

<b>CEGL</b>	<b>Ecological Systems (Comer 2004)</b>	<b>Association Scientific Name</b>	<b>Translated Name</b>	<b>Common Name</b>	<b>Plots Attributed to Association</b>	<b>Global Rank (G-rank)</b>
7178	Human Modified/ Successional	<i>Pinus strobus</i> Planted Forest	Eastern White Pine Planted Forest	White Pine Plantation	CHCH.48	GNA
4730	Human Modified/ Successional	<i>Pinus virginiana</i> Planted Forest	Virginia Pine Planted Forest	Virginia Pine Plantation	CHCH.50	GNA
8462	Human Modified/ Successional	<i>Pinus taeda</i> - <i>Liquidambar styraciflua</i> Semi-natural Forest	Loblolly Pine - Sweetgum Semi-natural Forest	Mid- to Late-Successional Loblolly Pine - Sweetgum Forest	CHCH.44 CHCH.49	GNA
7105	Human Modified/ Successional	<i>Pinus taeda</i> - <i>Liriodendron tulipifera</i> / <i>Acer saccharum</i> Successional Forest	Loblolly Pine - Tuliptree / Sugar Maple Successional Forest	Interior Mid- to Late-Successional Loblolly Forest	CHCH.09	GNA
7124	Human Modified/ Successional	<i>Juniperus virginiana</i> var. <i>virginiana</i> - ( <i>Quercus</i> spp.) Forest	Eastern Red-cedar - (Oak species) Forest	Red-cedar Successional Forest	CHCH.14	GNA
7879	Human Modified/ Successional	<i>Juglans nigra</i> / <i>Verbesina alternifolia</i> Forest	Black Walnut / Common Wingstem Forest	Successional Black Walnut Forest	CHCH.07 (in part)	GNA
7216	Human Modified/ Successional	<i>Liquidambar styraciflua</i> Forest	Sweetgum Forest	Successional Sweetgum Forest		GNA
7184	Human Modified/ Successional	<i>Liriodendron tulipifera</i> - <i>Acer negundo</i> Forest	Tuliptree - Box-elder Forest	Successional Tuliptree Bottomland Forest		G4G5
7220	Human Modified/ Successional	<i>Liriodendron tulipifera</i> / <i>Cercis canadensis</i> Forest	Tuliptree / Redbud Forest	Successional Tuliptree Forest (Circumneutral Type)	CHCH.39	GNA
8430	Allegheny-Cumberland Dry Oak Forest and Woodland	<i>Quercus alba</i> - ( <i>Quercus prinus</i> ) / <i>Hydrangea quercifolia</i> - <i>Viburnum acerifolium</i> / <i>Carex picta</i> - <i>Piptochaetium avenaceum</i> Forest	White Oak - (Rock Chestnut Oak) / Oakleaf Hydrangea - Mapleleaf Viburnum / Painted Sedge - Eastern Speargrass Forest	Cumberland Plateau Dry-Mesic White Oak Forest	CHCH.25 CHCH.26 CHCH.31 CHCH.33 CHCH.37	G3G4

**Table 6. Association Unique Identifiers (CEGLs), plot numbers, and global ranks of all associations identified at Chickamauga and Chattanooga National Military Park.**

CEGL	Ecological Systems (Comer 2004)	Association Scientific Name	Translated Name	Common Name	Plots Attributed to Association	Global Rank (G-rank)
7233	Allegheny-Cumberland Dry Oak Forest and Woodland	Quercus alba - (Quercus rubra, Acer saccharum, Fagus grandifolia) / Aesculus flava Forest	White Oak - (Northern Red Oak, Sugar Maple, American Beech) / Yellow Buckeye Forest	Rich Low-Elevation Appalachian Oak Forest	CHCH.18	G4
7709	South-Central Interior Small Stream and Riparian	Quercus alba - Carya (alba, ovata) - Liriodendron tulipifera - (Quercus phellos) / Cornus florida Forest	White Oak - (Mockernut Hickory, Shagbark Hickory) - Tuliptree - (Willow Oak) / Flowering Dogwood Forest	Highland Rim White Oak - Tuliptree Mesic Lower Slope Forest	CHCH.01	G4
7240	Allegheny-Cumberland Dry Oak Forest and Woodland	Quercus alba - Quercus rubra - Carya ovata / Cercis canadensis - Juniperus virginiana var. virginiana Forest	White Oak - Northern Red Oak - Shagbark Hickory / Redbud - Eastern Red-cedar Forest	Ridge-and-Valley Dry-Mesic White Oak - Hickory Forest		G4
8443	Allegheny-Cumberland Dry Oak Forest and Woodland	Quercus alba - Quercus stellata / Ostrya virginiana - Acer barbatum / Chasmanthium sessiliflorum Forest	White Oak - Post Oak / Eastern Hop-hornbeam - Southern Sugar Maple / Longleaf Spikegrass Forest	White Oak - Post Oak Subcalcareous Forest	CHCH.02	G3G4
7247	Allegheny-Cumberland Dry Oak Forest and Woodland	Quercus falcata - Quercus (coccinea, stellata) / Vaccinium (pallidum, stamineum) Forest	Southern Red Oak - (Scarlet Oak, Post Oak) / (Hillside Blueberry, Deerberry) Forest	Southeastern Interior Southern Red Oak - Scarlet Oak Forest	CHCH.08 CHCH.10	G4
6017	Allegheny-Cumberland Dry Oak Forest and Woodland	Acer saccharum - Quercus muehlenbergii / Cercis canadensis Forest	Sugar Maple - Chinquapin Oak / Redbud Forest	Appalachian Sugar Maple - Chinquapin Oak Limestone Forest	CHCH.35 CHCH.40	G4?
7699	Allegheny-Cumberland Dry Oak Forest and Woodland	Quercus muehlenbergii - Quercus (falcata, shumardii, stellata) / Cercis canadensis / Viburnum rufidulum Forest	Chinquapin Oak - (Southern Red Oak, Shumard Oak, Post Oak) / Redbud / Rusty Blackhaw Forest	Interior Low Plateau Chinquapin Oak - Mixed Oak Forest	CHCH.06	G3
7808	Southern Ridge and Valley Dry Calcareous Forest	Quercus muehlenbergii - Quercus shumardii - Carya (carolinae-septentrionalis, ovata) Forest	Chinquapin Oak - Shumard Oak - (Carolina Shagbark Hickory, Shagbark Hickory) Forest	Interior Plateau Chinquapin Oak - Shumard Oak Forest	CHCH.12 CHCH.13 CHCH.15 CHCH.17	G3

**Table 6. Association Unique Identifiers (CEGLs), plot numbers, and global ranks of all associations identified at Chickamauga and Chattanooga National Military Park.**

CEGL	Ecological Systems (Comer 2004)	Association Scientific Name	Translated Name	Common Name	Plots Attributed to Association	Global Rank (G-rank)
8431	Allegheny-Cumberland Dry Oak Forest and Woodland	Quercus prinus - (Quercus coccinea) / Carya pallida / Vaccinium arboreum - Vaccinium pallidum Forest	Rock Chestnut Oak - (Scarlet Oak) / Sand Hickory / Farkleberry - Hillside Blueberry Forest	Xeric Ridgetop Chestnut Oak Forest	CHCH.24 CHCH.45	G4G5
7700	Allegheny-Cumberland Dry Oak Forest and Woodland	Quercus prinus - Quercus spp. / Vaccinium arboreum - (Kalmia latifolia, Styrax grandifolius) Forest	Rock Chestnut Oak - Oak species / Farkleberry (Mountain Laurel, Bigleaf Snowbell) Forest	Interior Low Plateau Chestnut Oak - Mixed Oak Forest	CHCH.27 CHCH.28 CHCH.29 CHCH.32 CHCH.34	G4
7231	Allegheny-Cumberland Dry Oak Forest and Woodland	Quercus alba - Carya (ovata, alba, glabra) - Pinus virginiana Forest	White Oak - (Shagbark Hickory, Mockernut Hickory, Pignut Hickory) - Virginia Pine Forest	Dry-Mesic Southern Appalachian White Oak - Hickory Forest	CHCH.47	G4G5
5033	South-Central Interior Large Floodplain	Acer negundo Forest	Box-elder Forest	Box-elder Floodplain Forest	CHCH.43	G4G5
7334	South-Central Interior Large Floodplain	Platanus occidentalis - Acer saccharinum - Juglans nigra - Ulmus rubra Forest	Sycamore - Silver Maple - Black Walnut - Slippery Elm Forest	Sycamore - Silver Maple Calcareous Floodplain Forest	CHCH.36 CHCH.42 CHCH.46	G4
8429	South-Central Interior Small Stream and Riparian	Platanus occidentalis - Celtis laevigata - Liriodendron tulipifera / Lindera benzoin - Arundinaria gigantea / Amphicarpaea bracteata Forest	Sycamore - Sugarberry - Tuliptree / Northern Spicebush - Giant Cane / Hog-peanut Forest	Rich Levee Mixed Hardwood Bottomland Forest	CHCH.23 CHCH.54	G3G4Q
8487	South-Central Interior Small Stream and Riparian	Quercus shumardii - Quercus michauxii - Quercus nigra / Acer barbatum - Tilia americana var. heterophylla Forest	Shumard Oak - Swamp Chestnut Oak - Water Oak / Southern Sugar Maple - Appalachian Basswood Forest	Southern Interior Oak Bottomland Forest	CHCH.53	G3G4Q
2103	South-Central Interior Large Floodplain	Salix nigra Forest	Black Willow Forest	Black Willow Riparian Forest		G4

**Table 6. Association Unique Identifiers (CEGLs), plot numbers, and global ranks of all associations identified at Chickamauga and Chattanooga National Military Park.**

CEGL	Ecological Systems (Comer 2004)	Association Scientific Name	Translated Name	Common Name	Plots Attributed to Association	Global Rank (G-rank)
8841	Central Interior Highlands and Appalachian Sinkhole and Depression Pond	Quercus phellos - Liquidambar styraciflua / Chasmanthium laxum Cumberland Plateau Forest	Willow Oak - Sweetgum / Slender Spikegrass Cumberland Plateau Forest	Cumberland Plateau Willow Oak Pond	CHCH.03 CHCH.52	G3
4731	Allegheny-Cumberland Dry Oak Forest and Woodland	Juniperus virginiana var. virginiana - Quercus spp. Forest	Eastern Red-cedar - Oak species Forest	Highland Rim Semi-natural Red-cedar - Oak Forest	CHCH.07	GNA
7493	Southern Appalachian Low Mountain Pine Forest	Pinus echinata - Quercus (prinus, falcata) / Oxydendrum arboreum / Vaccinium pallidum Forest	Shortleaf Pine - (Rock Chestnut Oak, Southern Red Oak) / Sourwood / Hillside Blueberry Forest	Southern Blue Ridge Escarpment Shortleaf Pine - Oak Forest	CHCH.22	G3G4
3807	Human Modified/Successional	Ligustrum sinense Upland Shrubland	Chinese Privet Upland Shrubland	Chinese Privet Shrubland		GNA
3901	South-Central Interior Small Stream and Riparian	Salix nigra Temporarily Flooded Shrubland	Black Willow Temporarily Flooded Shrubland	Black Willow Riverbank Shrubland		G4?
3938	Ridge and Valley Calcareous Valley Bottom Glade and Woodland	Juniperus virginiana var. virginiana - Forestiera ligustrina - Rhus aromatica - Hypericum frondosum Shrubland	Eastern Red-cedar - Glade Privet - Fragrant Sumac - Golden St. John's-wort Shrubland	Central Basin Limestone Glade Margin Shrubland		G3G4
4048	Human Modified/Successional	Lolium (arundinaceum, pratense) Herbaceous Vegetation	(Tall Fescue, Meadow Fescue) Herbaceous Vegetation	Cultivated Meadow	CHCH.04 CHCH.05 CHCH.11	GNA
4510	Central Interior Highlands and Appalachian Sinkhole and Depression Pond	Sparganium americanum - Epilobium leptophyllum Herbaceous Vegetation	American Bur-reed - Narrowleaf Willow-herb Herbaceous Vegetation	Piedmont/Mountain Semipermanent Impoundment (Montane Boggy Type)	CHCH.03 (in part)	G2G3
4169	Ridge and Valley Calcareous Valley Bottom Glade and Woodland	Eleocharis compressa - Schoenolirion croceum - Carex crawei - Allium cernuum Herbaceous Vegetation	Flat Spikerush - Yellow Sunnysbell - Crawe's Sedge - Nodding Onion Herbaceous Vegetation	Limestone Seep Glade	CHCH.21 (in part)	G2?

**Table 6. Association Unique Identifiers (CEGLs), plot numbers, and global ranks of all associations identified at Chickamauga and Chattanooga National Military Park.**

CEGL	Ecological Systems (Comer 2004)	Association Scientific Name	Translated Name	Common Name	Plots Attributed to Association	Global Rank (G-rank)
5131	Ridge and Valley Calcareous Valley Bottom Glade and Woodland	Quercus muehlenbergii - Juniperus virginiana / Schizachyrium scoparium - Manfreda virginica Wooded Herbaceous Vegetation	Chinquapin Oak - Eastern Red-cedar / Little Bluestem - Eastern Agave Wooded Herbaceous Vegetation	Central Limestone Glade	CHCH.16 CHCH.19 CHCH.21 CHCH.51	G2G3
4290	South-Central Interior Small Stream and Riparian	Polygonum (hydropiperoides, punctatum) - Leersia (lenticularis, virginica) Herbaceous Vegetation	(Swamp Smartweed, Dotted Smartweed) - (Catchfly Cutgrass, White Cutgrass) Herbaceous Vegetation	Smartweed - Cutgrass Beaver Pond	CHCH.03 (in part)	G4?
4339	Ridge and Valley Calcareous Valley Bottom Glade and Woodland	Sporobolus (neglectus, vaginiflorus) Herbaceous Vegetation	(Barrens Dropseed, Poverty Dropseed) Herbaceous Vegetation	Southern Ridge and Valley Annual Grass Glade	CHCH.20	G2G3
4392	Cumberland Acid Cliff	Asplenium montanum - Heuchera parviflora var. parviflora - Silene rotundifolia Sparse Vegetation	Mountain Spleenwort - Cave Alumroot - Sandstone Fire-pink Sparse Vegetation	Cumberland Plateau Sandstone Cliff (Dry Type)	CHCH.41	G3G4
4454	Southern Appalachian Montane Cliff and Talus	Parthenocissus quinquefolia / Dicentra eximia Sparse Vegetation	Virginia Creeper / Appalachian Bleeding- heart Sparse Vegetation	Appalachian Talus Slope	CHCH.30	G2G3Q

**Global rank**

G1 = Critically imperiled globally

G2 = Imperiled globally

G3 = Rare or uncommon

G4 = Widespread, abundant, and apparently secure, but with cause for long-term concern

G5 = Demonstrably widespread, abundant and secure

G? = Unranked

GNA = Not ranked (usually because it is a human modified or exotic type)

Qualifiers:

? = Inexact numeric rank

Q = Questionable taxonomy

**Table 7. Plot photo names and photo descriptions for Chickamauga and Chattanooga National Military Park.**

<b>Photo file name</b>	<b>Date taken</b>	<b>Photographer</b>	<b>Description of photo</b>
CHCHPlot01.jpg	8-28-02	Tom Govus	Plot 1
CHCHPlot02.jpg	8-28-02	Tom Govus	Plot 2
CHCHPlot03.jpg	8-29-02	Tom Govus	Plot 3
CHCHPlot04.jpg	8-27-02	Tom Govus	Plot 4
CHCHPlot05.jpg	8-27-02	Tom Govus	Plot 5
CHCHPlot06.jpg	8-28-02	Rob Evans	Plot 6
CHCHPlot07.jpg	8-29-02	Tom Govus	Plot 7
CHCHPlot08.jpg	8-27-02	Rob Evans	Plot 8
CHCHPlot09.jpg	8-27-02	Tom Govus	Plot 9
CHCHPlot10.jpg	8-26-02	Tom Govus	Plot 10
CHCHPlot11.jpg	8-28-02	Tom Govus	Plot 11
CHCHPlot12.jpg	8-28-02	Tom Govus	Plot 12
CHCHPlot13.jpg	8-29-02	Tom Govus	Plot 13
CHCHPlot14.jpg	8-27-02	Rob Evans	Plot 14
CHCHPlot15.jpg	8-27-02	Tom Govus	Plot 15
CHCHPlot16.jpg	8-26-02	Tom Govus	Plot 16
CHCHPlot17.jpg	8-28-02	Tom Govus	Plot 17
CHCHPlot18.jpg	8-30-02	Tom Govus	Plot 18
CHCHPlot20.jpg	9-23-02	Tom Govus	Plot 20
CHCHPlot21.jpg	6-25-03	Tom Govus	Plot 21
CHCHPlot22.jpg	6-24-03	Tom Govus	Plot 22
CHCHPlot23.jpg	6-25-03	Tom Govus	Plot 23
CHCHPlot26.jpg	4-30-03	Tom Govus	Plot 26
CHCHPlot27.jpg	4-29-03	Tom Govus	Plot 27
CHCHPlot29.jpg	6-24-03	Tom Govus	Plot 29
CHCHPlot31.jpg	6-24-03	Tom Govus	Plot 31
CHCHPlot32.jpg	4-29-03	Tom Govus	Plot 32
CHCHPlot33.jpg	9-24-02	Tom Govus	Plot 33
CHCHPlot34.jpg	9-24-02	Tom Govus	Plot 34
CHCHPlot35.jpg	9-24-02	Tom Govus	Plot 35
CHCHPlot36.jpg	6-23-03	Tom Govus	Plot 36

**Table 7. Plot photo names and photo descriptions for Chickamauga and Chattanooga National Military Park (cont).**

<b>Photo file name</b>	<b>Date taken</b>	<b>Photographer</b>	<b>Description of photo</b>
CHCHPlot37.jpg	9-24-02	Tom Govus	Plot 37
CHCHPlot38.jpg	6-24-03	Tom Govus	Plot 38
CHCHPlot39.jpg	8-30-02	Tom Govus	Plot 39
CHCHPlot41.jpg	4-28-05	Tom Govus	Plot 41
CHCHPlot43.jpg	9-27-05	Tom Govus	Plot 43
CHCHPlot44.jpg	9-15-05	Tom Govus	Plot 44
CHCHPlot45.jpg	9-15-05	Tom Govus	Plot 45
CHCHPlot46.jpg	9-15-05	Tom Diggs	Plot 46
CHCHPlot47.jpg	9-28-05	Tom Govus	Plot 47
CHCHPlot48.jpg	9-28-05	Tom Govus	Plot 48
CHCHPlot49.jpg	9-28-05	Tom Govus	Plot 49
CHCHPlot50.jpg	9-28-05	Tom Govus	Plot 50
CHCHPlot51.jpg	9-23-02	Tom Govus	Plot 51
CHCHPlot52.jpg	7-01-06	Tom Govus	Plot 52
CedarGadeGeneral.jpg	9-23-02	Tom Govus	Glade photo
CedarGlade#2.jpg	9-23-02	Tom Govus	Glade photo
CedarGlade#3.jpg	9-23-02	Tom Govus	Glade photo
PedimelumSubacaule.jpg	4-27-05	Tom Govus	Glade plant photo
RatibidaPinnata.jpg	6-25-03	Tom Govus	Glade plant photo
RuelliaHumilis.jpg	9-27-02	Tom Govus	Glade plant photo
SandstoneCliffsCHCH.jpg	4-28-05	Tom Govus	West Lookout Mtn

**Appendix I. Plot sheets used for permanent plots (formatted to fit this report).**

**Location name** \_\_\_\_\_ *Jurisdiction (State):* \_\_\_\_\_  
 Location organization (NPS, USFS, etc.) \_\_\_\_\_  
 Air photo # (if known) \_\_\_\_\_ Polygon code (if known) \_\_\_\_\_ Subplot? Y or N Subplot Parent Code \_\_\_\_\_

**Provisional community name** \_\_\_\_\_  
 Classified community name \_\_\_\_\_  
 Classifier \_\_\_\_\_ Date \_\_\_\_\_

*TUSNVC Elcode* \_\_\_\_\_ *EONum-Suffix* \_\_\_\_\_

**Sublocation (I.D.able feature on topo map)** \_\_\_\_\_

**USGS Quad name** \_\_\_\_\_ *Quad code (if known)* \_\_\_\_\_

Survey date: \_\_\_\_\_ Surveyors: \_\_\_\_\_

---

**Directions to permanent marker and to the plot (use reverse of sheet if necessary):**

\_\_\_\_\_

---

*Vegetation Plot length (m)* \_\_\_\_\_ *Plot width (m)* \_\_\_\_\_ *Plot shape (rectangle?)* \_\_\_\_\_ *Permanent? Y or N*

**Digital photos**  **Regular camera**  **No pictures taken** **Roll# or disc #** \_\_\_\_\_ **Frame #** \_\_\_\_\_

**Plot representativeness** (is the matrix the same?) \_\_\_\_\_

\_\_\_\_\_

**UTM**  **Lat/long** (if lat/long, then values are \_\_\_\_\_ **N** \_\_\_\_\_ **W**)

**GPS Techniques/Equipment** \_\_\_\_\_ **GPS file name** \_\_\_\_\_

**Field UTM X** \_\_\_\_\_ **m E** **Corrected UTM X** \_\_\_\_\_ **m E**  
**Field UTM Y** \_\_\_\_\_ **m N** **Corrected UTM Y** \_\_\_\_\_ **m N**

**Coordinate accuracy** \_\_\_\_\_ **m / ft** **UTM Zone** \_\_\_\_\_ **GPS location with respect to permanent marker if not 0,0: x** \_\_\_\_\_ **y** \_\_\_\_\_

*Estimated position marked on Topo. Sheet.* **Elevation** \_\_\_\_\_ **m / ft** *topo map? altimeter? DEM? GPS?*

**ENVIRONMENTAL / SITE INFORMATION**

<p><b>Measured Slope</b> _____ °</p> <p><input type="checkbox"/> Flat 0° 0%</p> <p><input type="checkbox"/> Gentle 0-5° 1-9%</p> <p><input type="checkbox"/> Mod 6-14° 10-25%</p> <p><input type="checkbox"/> Somewhat steep 15-25° 26-49%</p> <p><input type="checkbox"/> Steep 27-45° 50-100%</p> <p><input type="checkbox"/> Very steep 45-69° 101-275%</p> <p><input type="checkbox"/> Abrupt 70-100° 276-300%</p> <p><input type="checkbox"/> overhanging/sheltered &gt;100° &gt;300%</p>	<p><b>Measured Aspect</b> _____ ° (N=0°)</p> <p><input type="checkbox"/> Flat</p> <p><input type="checkbox"/> Variable</p> <p><input type="checkbox"/> N 338-22°</p> <p><input type="checkbox"/> NE 23-67°</p> <p><input type="checkbox"/> E 68-112°</p> <p><input type="checkbox"/> SE 113-157°</p> <p><input type="checkbox"/> S 158-202°</p> <p><input type="checkbox"/> SW 203-247°</p> <p><input type="checkbox"/> W 248-292°</p> <p><input type="checkbox"/> NW 293-337°</p> <p><b>Compass:</b> magnetic ? / corrected?</p>	<p><b>Topographic Position</b></p> <p><input type="checkbox"/> Interfluvial (Ridge, summit or crest)</p> <p><input type="checkbox"/> High Slope (upper slope, convex slope)</p> <p><input type="checkbox"/> Midslope (middle slope)</p> <p><input type="checkbox"/> Lowslope (lower slope, footslope)</p> <p><input type="checkbox"/> Toeslope (alluvial toeslope)</p> <p><input type="checkbox"/> Low level (terrace)</p> <p><input type="checkbox"/> Channel bed</p> <p><i>Cowardin System</i></p> <p><input type="checkbox"/> <i>Upland</i> <input type="checkbox"/> <i>Palustrine</i></p> <p><input type="checkbox"/> <i>Estuarine</i> <input type="checkbox"/> <i>Lacustrine</i></p> <p><input type="checkbox"/> <i>Riverine</i></p>
--	---	---

<b>Landform</b> (check most applicable)		
<input type="checkbox"/> Alluvial flat	<input type="checkbox"/> Draw	<input type="checkbox"/> Saddle
<input type="checkbox"/> Alluvial terrace	<input type="checkbox"/> Floodplain	<input type="checkbox"/> Scour
<input type="checkbox"/> Bank	<input type="checkbox"/> Gap	<input type="checkbox"/> Seep
<input type="checkbox"/> Bar	<input type="checkbox"/> Hanging valley	<input type="checkbox"/> Toe slope
<input type="checkbox"/> Bench	<input type="checkbox"/> Knob	<input type="checkbox"/> Slope
<input type="checkbox"/> Cliff	<input type="checkbox"/> Midslope	<input type="checkbox"/> Streambed
<input type="checkbox"/> Colluvial Slope	<input type="checkbox"/> Mima mound	<input type="checkbox"/> Slough
<input type="checkbox"/> Cove	<input type="checkbox"/> Nose slope	<input type="checkbox"/> Streamhead
<input type="checkbox"/> Debris slide	<input type="checkbox"/> Ravine	<input type="checkbox"/>
<input type="checkbox"/> Depression	<input type="checkbox"/> Ridge	<input type="checkbox"/>
	<input type="checkbox"/> Ridgetop bedrock outcrop	<input type="checkbox"/>

<b>Geology</b>		
<u>Igneous Rocks:</u>	<u>Sedimentary Rocks:</u>	<u>Metamorphic Rocks:</u>
<input type="checkbox"/> Granitic (Granite, Schyolite, Syenite, Trachyte)	<input type="checkbox"/> Conglomerates and Breccias	<input type="checkbox"/> Gneiss
<input type="checkbox"/> Dioritic (Diorite, Dacite, Andesite)	<input type="checkbox"/> Sandstone & conglomerate	<input type="checkbox"/> Schist
<input type="checkbox"/> Gabbroic (Gabbro, Basalt, Pyroxenite, Peridotite Diabase, Traprock)	<input type="checkbox"/> Siltstone (calcareous or noncalc)	<input type="checkbox"/> Slate and Phyllite
	<input type="checkbox"/> Shale (calcareous or noncalc)	<input type="checkbox"/> Marble
	<input type="checkbox"/> Limestone and Dolomite	<input type="checkbox"/> Serpentine (Ultramafic)
	<input type="checkbox"/> Gypsum	
	<input type="checkbox"/> Marl	<input type="checkbox"/> Other _____
<b>Hydrologic Regime (check only for wetlands)</b>	<b>Salinity/Halinity Modifiers:</b>	<b>Hydrology Evidence</b> (Describe the hydrological factors that caused you to assign the type to the hydrologic regime that you chose.):
<input type="checkbox"/> Intermittently flooded	<i>Upland (N/A)</i>	
<input type="checkbox"/> Permanently flooded	<i>Coastal Tidal: Saltwater- Tidal</i>	
<input type="checkbox"/> Semipermanently flooded	<i>Coastal Tidal – Brackish</i>	
<input type="checkbox"/> Temporarily Flooded (e.g. floodplains)	<i>Coastal Tidal – Freshwater</i>	
<input type="checkbox"/> Seasonally Flooded (e.g. seasonal ponds)	<i>Inland Saltwater</i>	
<input type="checkbox"/> Saturated (e.g. bogs, perennial seeps)	<i>Inland Brackish seeps)</i>	
<input type="checkbox"/> Unknown	<i>Unknown</i>	
<input type="checkbox"/> Not a wetland (Upland: XERIC : DRY - MESIC : MESIC)		
<input type="checkbox"/> Permanently flooded – Tidal		
<input type="checkbox"/> Tidally flooded		
<input type="checkbox"/> Irregularly flooded		
<input type="checkbox"/> Irregularly exposed		

<i>Environmental comments:</i>
<i>Landscape comments:</i>

<b>Soil Texture:</b>	<b>Soil Taxon Description:</b>
<input type="checkbox"/> Sand	_____
<input type="checkbox"/> Sandy loam	_____
<input type="checkbox"/> Loam	_____
<input type="checkbox"/> Silt loam	
<input type="checkbox"/> Clay loam	
<input type="checkbox"/> Clay	
<input type="checkbox"/> Peat	
<input type="checkbox"/> Muck	
	<b>Drainage:</b>
	<input type="checkbox"/> Rapidly drained <input type="checkbox"/> Somewhat poorly drained
	<input type="checkbox"/> Well drained <input type="checkbox"/> Poorly drained
	<input type="checkbox"/> Moderately well drained <input type="checkbox"/> Very poorly drained
	Soil depth (optional): _____







**Appendix II. USNVC Classification of Plant Associations at  
Chickamauga and Chattanooga National Military Park**

**INTERNATIONAL ECOLOGICAL  
CLASSIFICATION STANDARD:**

**TERRESTRIAL ECOLOGICAL CLASSIFICATIONS**

**Chickamauga-Chattanooga National Military Park**

30 January 2007

by

NatureServe

1101 Wilson Blvd., 15<sup>th</sup> floor  
Arlington, VA 22209

6114 Fayetteville St, Suite 109  
Durham, NC 27713

This subset of the International Ecological Classification Standard covers associations and alliances attributed to Chickamauga-Chattanooga National Military Park. This classification has been developed in consultation with many individuals and agencies and incorporates information from a variety of publications and other classifications. Comments and suggestions regarding the contents of this subset should be directed to Mary J. Russo, Central Ecology Data Manager, Durham, NC <mary\_russo@natureserve.org> and Carl Nordman, Regional Ecologist, Durham, NC <carl\_nordman@natureserve.org>.



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**Citations:**

*The following citation should be used in any published materials which reference ecological system and/or International Vegetation Classification (IVC hierarchy) and association data:*

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<sup>1</sup> NatureServe is an international organization including NatureServe regional offices, a NatureServe central office, U.S. State Natural Heritage Programs, and Conservation Data Centres (CDC) in Canada and Latin America and the Caribbean. Ecologists from the following organizations have contributed the development of the ecological systems classification:

#### **United States**

Central NatureServe Office, Arlington, VA; Eastern Regional Office, Boston, MA; Midwestern Regional Office, Minneapolis, MN; Southeastern Regional Office, Durham, NC; Western Regional Office, Boulder, CO; Alabama Natural Heritage Program, Montgomery AL; Alaska Natural Heritage Program, Anchorage, AK; Arizona Heritage Data Management Center, Phoenix AZ; Arkansas Natural Heritage Commission Little Rock, AR; Blue Ridge Parkway, Asheville, NC; California Natural Heritage Program, Sacramento, CA; Colorado Natural Heritage Program, Fort Collins, CO; Connecticut Natural Diversity Database, Hartford, CT; Delaware Natural Heritage Program, Smyrna, DE; District of Columbia Natural Heritage Program/National Capital Region Conservation Data Center, Washington DC; Florida Natural Areas Inventory, Tallahassee, FL; Georgia Natural Heritage Program, Social Circle, GA; Great Smoky Mountains National Park, Gatlinburg, TN; Gulf Islands National Seashore, Gulf Breeze, FL; Hawaii Natural Heritage Program, Honolulu, Hawaii; Idaho Conservation Data Center, Boise, ID; Illinois Natural Heritage Division/Illinois Natural Heritage Database, Springfield, IL; Indiana Natural Heritage Data Center, Indianapolis, IN; Iowa Natural Areas Inventory, Des Moines, IA; Kansas Natural Heritage Program, Lawrence, KS; Kentucky Natural Heritage Program, Frankfort, KY; Louisiana Natural Heritage Program, Baton Rouge, LA; Maine Natural Areas Program, Augusta, ME; Mammoth Cave National Park, Mammoth Cave, KY; Maryland Wildlife & Heritage Division, Annapolis, MD; Massachusetts Natural Heritage & Endangered Species Program, Westborough, MA; Michigan Natural Features Inventory, Lansing, MI; Minnesota Natural Heritage & Nongame Research and Minnesota County Biological Survey, St. Paul, MN; Mississippi Natural Heritage Program, Jackson, MI; Missouri Natural Heritage Database, Jefferson City, MO; Montana Natural Heritage Program, Helena, MT; National Forest in North Carolina, Asheville, NC; National Forests in Florida, Tallahassee, FL; National Park Service, Southeastern Regional Office, Atlanta, GA; Navajo Natural Heritage Program, Window Rock, AZ; Nebraska Natural Heritage Program, Lincoln, NE; Nevada Natural Heritage Program, Carson City, NV; New Hampshire Natural Heritage Inventory, Concord, NH; New Jersey Natural Heritage Program, Trenton, NJ; New Mexico Natural Heritage Program, Albuquerque, NM; New York Natural Heritage Program, Latham, NY; North Carolina Natural Heritage Program, Raleigh, NC; North Dakota Natural Heritage Inventory, Bismarck, ND; Ohio Natural Heritage Database, Columbus, OH; Oklahoma Natural Heritage Inventory, Norman, OK; Oregon Natural Heritage Program, Portland, OR; Pennsylvania Natural Diversity Inventory, PA; Rhode Island Natural Heritage Program, Providence, RI; South Carolina Heritage Trust, Columbia, SC; South Dakota Natural Heritage Data Base, Pierre, SD; Tennessee Division of Natural Heritage, Nashville, TN; Tennessee Valley Authority Heritage Program, Norris, TN; Texas Conservation Data Center, San Antonio, TX; Utah Natural Heritage Program, Salt Lake City, UT; Vermont Nongame & Natural Heritage Program, Waterbury, VT; Virginia Division of Natural Heritage, Richmond, VA; Washington Natural Heritage Program, Olympia, WA; West Virginia Natural Heritage Program, Elkins, WV; Wisconsin Natural Heritage Program, Madison, WI; Wyoming Natural Diversity Database, Laramie, WY

#### **Canada**

Alberta Natural Heritage Information Centre, Edmonton, AB, Canada; Atlantic Canada Conservation Data Centre, Sackville, New Brunswick, Canada; British Columbia Conservation Data Centre, Victoria, BC, Canada; Manitoba Conservation Data Centre, Winnipeg, MB, Canada; Ontario Natural Heritage Information Centre, Peterborough, ON, Canada; Quebec Conservation Data Centre, Quebec, QC, Canada; Saskatchewan Conservation Data Centre, Regina, SK, Canada; Yukon Conservation Data Centre, Yukon, Canada

#### **Latin American and Caribbean**

Centro de Datos para la Conservacion de Bolivia, La Paz, Bolivia; Centro de Datos para la Conservacion de Colombia, Cali, Valle, Columbia; Centro de Datos para la Conservacion de Ecuador, Quito, Ecuador; Centro de Datos para la Conservacion de Guatemala, Ciudad de Guatemala, Guatemala; Centro de Datos para la Conservacion de Panama, Quarry Heights, Panama; Centro de Datos para la Conservacion de Paraguay, San Lorenzo, Paraguay; Centro de Datos para la Conservacion de Peru, Lima, Peru; Centro de Datos para la Conservacion de Sonora, Hermosillo, Sonora, Mexico; Netherlands Antilles Natural Heritage Program, Curacao, Netherlands Antilles; Puerto Rico-Departamento De Recursos Naturales Y Ambientales, Puerto Rico; Virgin Islands Conservation Data Center, St. Thomas, Virgin Islands.

NatureServe also has partnered with many International and United States Federal and State organizations, which have also contributed significantly to the development of the International Classification. Partners include the following The Nature Conservancy; Provincial Forest Ecosystem Classification Groups in Canada; Canadian Forest Service; Parks Canada; United States Forest Service; National GAP Analysis Program; United States National Park Service; United States Fish and Wildlife Service; United States Geological Survey; United States Department of Defense; Ecological Society of America; Environmental Protection Agency; Natural Resource Conservation Services; United States Department of Energy; and the Tennessee Valley Authority. Many individual state organizations and people from academic institutions have also contributed to the development of this classification.

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**White Pine Plantation***Pinus strobus* Planted Forest

Eastern White Pine Planted Forest

Identifier: CEGL007178

**NVC Classification**

Physiognomic Class	Forest (I)
Physiognomic Subclass	Evergreen forest (I.A.)
Physiognomic Group	Temperate or subpolar needle-leaved evergreen forest (I.A.8.)
Physiognomic Subgroup (I.A.8.C.)	Planted/Cultivated temperate or subpolar needle-leaved evergreen forest
Formation (I.A.8.C.x.)	Planted/cultivated temperate or subpolar needle-leaved evergreen forest
Alliance	<i>Pinus strobus</i> Planted Forest Alliance (A.98)
Alliance (English name)	Eastern White Pine Planted Forest Alliance
Association	<i>Pinus strobus</i> Planted Forest
Association (English name)	Eastern White Pine Planted Forest
Association (Common name)	White Pine Plantation

**Ecological System(s):****ELEMENT CONCEPT**

**Global Summary:** This white pine plantation type is found throughout the northeastern and midwestern United States and adjacent Canada. Stands contain plantations of *Pinus strobus* that are maintained for the extraction of forest products. Some have been planted as reclamation projects (e.g., following strip-mining). At maturity, the tree canopy is usually dense and contains a monospecific layer of *Pinus strobus*. *Pinus resinosa* is occasionally present in small amounts. In older stands or gaps, regenerating trees may include *Fagus grandifolia*, *Acer saccharum*, *Acer rubrum*, and *Prunus serotina*; *Robinia pseudoacacia* and *Betula lenta* are occasionally present. *Acer pensylvanicum* and *Ostrya virginiana* are common small trees. The shrub layer is typically sparse and mostly consists of smaller individuals of the tree species. The field layer varies from sparse to absent; it may be locally well-developed in small openings, with variable composition. In some stands, mosses may be abundant. Susceptibility to a variety of pests or diseases, including white pine blister rust (*Cronartium ribicola*) and southern pine beetle (*Dendroctonus frontalis*), has had some impact on its commercial use.

**ENVIRONMENTAL DESCRIPTION****USFWS Wetland System:**

**Chickamauga-Chattanooga National Military Park Environment:** The example at Chickamauga-Chattanooga National Military Park is located at Moccasin Bend on the floodplain of the Tennessee River and has been impacted by southern pine beetle and windstorm and/or ice damage. The general landscape is also of a disturbed and successional character. The site is probably very infrequently flooded and at low elevation of 200 m (650 feet).

**Global Environment:** Stands contain plantations of *Pinus strobus* that are maintained for the extraction of forest products. The type does well on a variety of soils. Some have been planted on strip-mine reclamation sites.

**VEGETATION DESCRIPTION**

**Chickamauga-Chattanooga National Military Park Vegetation:** This particular stand has a very open character of *Pinus strobus*, but due to the disturbance by southern pine beetle and possibly disease, the canopy also includes a substantial mix of *Pinus taeda* (loblolly pine) and successional hardwoods (*Liriodendron tulipifera* and *Liquidambar styraciflua*). The invasive *Ligustrum sinense* (Chinese privet) is dominant in a thicket type shrub layer. Another invasive, *Microstegium vimineum* (Japanese stiltgrass) dominates the herb layer. Vine species such as *Parthenocissus quinquefolia*, *Lonicera japonica*, and *Bignonia capreolata* are also prominent.

**Global Vegetation:** The tree canopy at maturity is usually dense and contains a monospecific layer of *Pinus strobus*. *Pinus resinosa* is occasionally present in small amounts. In older stands or gaps, regenerating trees may

include *Fagus grandifolia*, *Acer saccharum*, *Acer rubrum*, and *Prunus serotina*; *Robinia pseudoacacia* and *Betula lenta* are occasionally present. *Acer pensylvanicum* and *Ostrya virginiana* are common small trees. The shrub layer is typically sparse and mostly consists of smaller individuals of the tree species. The field layer varies from sparse to absent; it may be locally well-developed in small openings, with variable composition. In some stands, mosses may be abundant.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Needle-leaved tree	<i>Pinus strobus</i>

##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Needle-leaved tree	<i>Pinus strobus</i>

#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Pinus strobus*

**Global:** *Pinus strobus*

#### OTHER NOTEWORTHY SPECIES

**Chickamauga-Chattanooga National Military Park:**

**Global:**

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** GNA (cultural) (8-Aug-2000). This community represents vegetation which 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. It is not a conservation priority and does not receive a conservation rank.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

##### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** There was a lot of planting of white pine from the 1930s into the 1950s, but there has been very little planting since then (P. Manion pers. comm. 2001). On the Daniel Boone National Forest of Kentucky, *Pinus strobus* plantings are of limited extent and are related to wildlife plantings. In the southern part of this type's range, there has been some damage from southern pine beetle (*Dendroctonus frontalis*). These plantations have been observed in the Peters Mountain area (James River Ranger District) and various other sites in the George Washington and Jefferson national forests.

##### Global Similar Associations:

*Pinus* spp. Planted Forest (CEGL006313)

*Pinus strobus* Successional Forest (CEGL007944)

##### Global Related Concepts:

IF3b. Plantation (Hardwood or Conifer) (Allard 1990) B

Unclassified Clearcut Regeneration (Fleming and Moorhead 2000) ?

#### OTHER COMMENTS

**Other Comments:**

#### ELEMENT DISTRIBUTION

**Chickamauga-Chattanooga National Military Park Range:** During the Chickamauga-Chattanooga classification project, this association was only sampled at Moccasin Bend.

**Global Range:** This white pine plantation type is found throughout the northeastern and midwestern United States and adjacent Canada.

**Nations:** CA, US

**States/Provinces:** GA, KY, MD, NC, NH, NY, PA, SC, TN, VA, VT, WV

**USFS Ecoregions:** 212:C, 221Ai:CCC, 221He:CCC, M212Ba:CCC, M221Aa:CCC, M221Bb:CCC, M221Ce:CCC, M221Dc:CCC, M221Dd:CCP

**Federal Lands:** DOD (Camp Dawson); NPS (Blue Ridge Parkway, Chickamauga-Chattanooga, Marsh-Billings-Rockefeller, New River Gorge, Valley Forge); USFS (Chattahoochee, Chattahoochee (Southern Blue Ridge), Cherokee, Daniel Boone, George Washington, Jefferson, Nantahala, Pisgah, Sumter, Sumter (Mountains)); USFWS (Chesapeake Marshlands)

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.48.

**Local Description Authors:** T. Govus

**Global Description Authors:** D. Faber-Langendoen, mod. S.C. Gawler

**References:** Allard 1990, Fleming and Coulling 2001, Fleming and Moorhead 2000, Reschke 1990, Southeastern Ecology Working Group n.d., TDNH unpubl. data, Vanderhorst 2001a, Vanderhorst 2001b, Vanderhorst 2007

### Loblolly Pine Plantation

*Pinus taeda* Planted Forest

Loblolly Pine Planted Forest

Identifier: CEGL007179

#### NVC Classification

Physiognomic Class	Forest (I)
Physiognomic Subclass	Evergreen forest (I.A.)
Physiognomic Group	Temperate or subpolar needle-leaved evergreen forest (I.A.8.)
Physiognomic Subgroup (I.A.8.C.)	Planted/Cultivated temperate or subpolar needle-leaved evergreen forest
Formation (I.A.8.C.x.)	Planted/cultivated temperate or subpolar needle-leaved evergreen forest
Alliance	<i>Pinus taeda</i> Planted Forest Alliance (A.99)
Alliance (English name)	Loblolly Pine Planted Forest Alliance
Association	<i>Pinus taeda</i> Planted Forest
Association (English name)	Loblolly Pine Planted Forest
Association (Common name)	Loblolly Pine Plantation

**Ecological System(s):**

#### ELEMENT CONCEPT

**Global Summary:** This association represents young, monospecific planted stands of *Pinus taeda*. Due to the commercial value of this species, this type is widely distributed across much of the southeastern United States from the Interior Highlands to the Coastal Plain, including areas outside the natural range of the species. The core concept of stands attributable to this type are those which support dense, often perfect rows of planted *Pinus taeda* or otherwise dense, young stands which are established, managed, and/or maintained for the extraction of forest products (usually pulpwood). In most cases these stands support almost no other tree species in the overstory. Understory composition and density can vary widely depending upon location, management history, and stand age.

Stands are typically established with mechanical planting, but may also be established through other means. This association rarely exceeds 20-40 years of age on most timberlands. Excluded from this association are plantation stands which have "broken up" with age or thinning to approximate a more natural structure. Dense planting in rows, if successful, tends to result in nearly complete canopy closure which persists until the stand has either been regenerated or transitions into a different association. Herbaceous ground cover of any kind tends to be sparse due to reduction during site preparation, the typically dense canopy cover, and to the fact that many young plantations are infrequently burned at best.

### ENVIRONMENTAL DESCRIPTION

#### USFWS Wetland System:

#### Chickamauga-Chattanooga National Military Park Environment:

#### Global Environment:

### VEGETATION DESCRIPTION

#### Chickamauga-Chattanooga National Military Park Vegetation:

**Global Vegetation:** In the Ouachita Mountains planted loblolly is found with a variable amount of *Quercus alba*, *Quercus falcata*, *Quercus marilandica*, *Quercus stellata*, and *Quercus velutina*; on drier sites *Pinus echinata*, *Carya alba*, and *Carya texana*; and *Acer rubrum*, *Liquidambar styraciflua*, and *Quercus nigra* on wetter sites. The understory can be thick especially after thinning and/or burning. Common understory species are *Vaccinium pallidum*, *Vaccinium arboreum*, *Vaccinium stamineum*, *Cornus florida*, *Ulmus alata*, and others. Vines are an important component, including *Berchemia scandens*, *Vitis* spp., *Smilax* spp., and *Toxicodendron radicans*. In dense stands the herbaceous layer is suppressed by dense needle litter. In thinned and burned stands the plantations are often grazed. Herbaceous species can include *Solidago ulmifolia*, *Chasmanthium sessiliflorum*, *Schizachyrium scoparium*, *Danthonia spicata*, *Tephrosia virginiana*, *Lespedeza* spp., *Symphytotrichum patens* (= *Aster patens*), *Eupatorium* spp., and others. In Oklahoma, associates include *Rhus copallinum*, *Hypericum densiflorum*, *Liquidambar styraciflua* and *Toxicodendron radicans* (Hoagland 2000). Additional data on several stands on the Croatan National Forest can be found in Doyle and Allard (1990).

### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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### CHARACTERISTIC SPECIES

#### Chickamauga-Chattanooga National Military Park:

#### Global:

### OTHER NOTEWORTHY SPECIES

#### Chickamauga-Chattanooga National Military Park:

#### Global:

### CONSERVATION STATUS RANK

**Global Rank & Reasons:** GNA (cultural) (8-Aug-2000). This community represents vegetation which 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. It is not a conservation priority and does not receive a conservation rank.

### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** At Arnold Air Force Base, Coffee and Franklin counties, Tennessee, *Pinus taeda* is near the edge of its putative natural range and was apparently absent prior to being planted there between 1945 and 1950 on abandoned agricultural land and along roadsides. Older plantings have not been intensively managed, and many have become "modified" vegetation (e.g., CEGLO07109) and are no longer regarded as plantations. More recently (1998-2001) some of these older pine stands have been harvested and replaced with true *Pinus taeda* plantations. *Pinus taeda* also invades seasonally wet hardwood depressions, but these stands remain recognizable as to their natural identity (e.g., CEGLO07364). Associations occur as plantations and on old fields on Kisatchie and Sumter national forests and after blowdowns on the Kisatchie. South Carolina information after Jones et al. (1981). In the Coastal Plain of South Carolina, there are mature loblolly plantations, often with *Prunus serotina* in the understory, that have been prescribed burned (based on seven plots at Savannah River Site) - such stands are presumably better covered under *Pinus taeda* Forest Alliance (A.130). Plantations occur in obvious rows in the aerial photos of the Delmarva Peninsula in Maryland.

**Global Similar Associations:**

*Pinus taeda* - *Liriodendron tulipifera* / *Acer saccharum* Successional Forest (CEGL007105)

*Pinus taeda* - *Quercus (falcata, hemisphaerica, nigra)* - *Liquidambar styraciflua* / *Rhus copallinum* - *Vaccinium stamineum* Forest (CEGL008450)

*Pinus taeda* / *Liquidambar styraciflua* - *Acer rubrum* var. *rubrum* / *Vaccinium stamineum* Forest (CEGL006011)-- develops when stands develop typical two-layered structure with well-developed subcanopy.

*Pinus taeda* / *Rhus copallinum* Managed Forest (CEGL007108)--may replace this association as stands mature.

*Pinus taeda* / *Saccharum alopecuroidum* - (*Andropogon* spp.) Forest (CEGL007109)

**Global Related Concepts:**

Loblolly Pine: 81 (Eyre 1980) B

**OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION****Chickamauga-Chattanooga National Military Park Range:**

**Global Range:** This association is found throughout the southeastern United States.

**Nations:** US

**States/Provinces:** AL, AR, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA?

**USFS Ecoregions:** 221Hc:CCC, 221He:CCC, 221Jb:CCC, 222C:CC, 222E:CC, 231Aa:CCC, 231Bh:CCC, 231Ca:CPP, 231Cd:CPP, 231E:CC, 232Ac:CCC, 232Bm:CCC, 232Br:CCC, 232Bx:CCC, 232Ca:CCC, 232Cb:CCC, 232Ce:CCC, 234A:CC, M221Cd:CCC, M221D:CC, M222A:CC, M231A:CC

**Federal Lands:** DOD (Arnold, Fort Benning, Fort Bragg, Fort Gordon, Fort Stewart); DOE (Savannah River Site); NPS (Chickamauga-Chattanooga?, Natchez Trace, Obed, Vicksburg); USFS (Angelina, Bankhead?, Bienville, Cherokee, Conecuh, Croatan, Davy Crockett, De Soto, Delta, Francis Marion, Holly Springs, Kisatchie, Land Between the Lakes, Oconee, Ouachita, Ouachita (Coastal Plain), Ouachita (Mountains), Ozark, Sabine NF, Sam Houston, St. Francis?, Sumter, Sumter (Mountains), Sumter (Piedmont), Talladega, Talladega (Oakmulgee), Talladega (Talladega), Tombigbee, Tuskegee); USFWS (Blackwater, Chesapeake Marshlands, Eufaula, Prime Hook)

**ELEMENT SOURCES****Chickamauga-Chattanooga National Military Park Inventory Notes:****Chickamauga-Chattanooga National Military Park Plots:****Local Description Authors:**

**Global Description Authors:** A.S. Weakley

**References:** ALNHP 2002, Doyle and Allard 1990, Eyre 1980, Hoagland 1998a, Hoagland 2000, Jones et al. 1981b, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, TNC 1998a

### **Virginia Pine Plantation**

*Pinus virginiana* Planted Forest

Virginia Pine Planted Forest

Identifier: CEGL004730

### **NVC Classification**

Physiognomic Class	Forest (I)
Physiognomic Subclass	Evergreen forest (I.A.)
Physiognomic Group	Temperate or subpolar needle-leaved evergreen forest (I.A.8.)
Physiognomic Subgroup (I.A.8.C.)	Planted/Cultivated temperate or subpolar needle-leaved evergreen forest
Formation (I.A.8.C.x.)	Planted/cultivated temperate or subpolar needle-leaved evergreen forest
Alliance	<i>Pinus virginiana</i> Planted Forest Alliance (A.100)
Alliance (English name)	Virginia Pine Planted Forest Alliance
Association	<i>Pinus virginiana</i> Planted Forest
Association (English name)	Virginia Pine Planted Forest
Association (Common name)	Virginia Pine Plantation

### **Ecological System(s):**

#### **ELEMENT CONCEPT**

**Global Summary:** This association includes planted stands of *Pinus virginiana* which have little understory, but they may have admixtures of other native or off-site pines (e.g., *Pinus echinata*, *Pinus strobus*, *Pinus taeda*). These are cultivated forests and are not considered natural or near-natural vegetation. They are maintained as plantations for the harvest of forest products, or for production of Christmas trees and on strip-mined sites. Stands have suffered some damage from southern pine beetle (*Dendroctonus frontalis*). Stands are planted in the Inner Coastal Plain for Christmas tree production.

#### **ENVIRONMENTAL DESCRIPTION**

##### **USFWS Wetland System:**

**Chickamauga-Chattanooga National Military Park Environment:** This association is located in a matrix of successional forests associated with applied fill dirt in the north-central portion of Moccasin Bend. The habitat consists largely of successional trees, shrubs and vines. The elevation is 200 m (660 feet).

**Global Environment:** These are cultivated forests and are not considered natural or near-natural vegetation. They are maintained as plantations for the harvest of forest products. Stands are planted in the Inner Coastal Plain for Christmas tree production.

#### **VEGETATION DESCRIPTION**

**Chickamauga-Chattanooga National Military Park Vegetation:** The example located during this study has a dense, somewhat low canopy of monospecific *Pinus virginiana*. A sparse shrub layer includes *Juniperus virginiana*, *Prunus serotina*, and *Acer negundo*, as well as the non-natives *Lonicera maackii* and *Ligustrum sinense*. The herb layer is sparse and also largely made up of non-native species, such as *Lonicera japonica* and *Microstegium vimineum*.

**Global Vegetation:** This association includes planted stands of *Pinus virginiana* with little understory, but may have admixtures of other native or off-site pines (e.g., *Pinus echinata*, *Pinus strobus*, *Pinus taeda*). At Arnold Air Force Base, Coffee and Franklin counties, Tennessee, *Pinus virginiana* is dominant in dry-mesic, low to mid-slope forests. *Pinus strobus* is scattered throughout, with *Juniperus virginiana* var. *virginiana* occurring in patches. The

subcanopy contains *Acer rubrum*, *Cornus florida*, and *Liquidambar styraciflua*. The tall-shrub layer includes *Sassafras albidum*, *Cornus florida*, *Cercis canadensis*, *Liquidambar styraciflua*, and *Quercus stellata*. The herbaceous layer is sparse or nearly absent, and contains *Polystichum acrostichoides*, Asteraceae sp., *Carex* spp., *Botrychium biternatum*, and exotic *Lonicera japonica*.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Needle-leaved tree	<i>Pinus virginiana</i>

##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Pinus virginiana*

**Global:**

#### OTHER NOTEWORTHY SPECIES

**Chickamauga-Chattanooga National Military Park:**

**Global:**

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** GNA (cultural) (8-Aug-2000). This community represents vegetation which 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. It is not a conservation priority and does not receive a conservation rank.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

##### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** Stands have suffered some damage from the Southern Pine Beetle (*Dendroctonus frontalis*).

**Global Similar Associations:**

##### Global Related Concepts:

IF3b. Plantation (Hardwood or Conifer) (Allard 1990) B  
Virginia Pine: 79 (Eyre 1980) B

#### OTHER COMMENTS

**Other Comments:**

#### ELEMENT DISTRIBUTION

**Chickamauga-Chattanooga National Military Park Range:** During the Chickamauga-Chattanooga classification project, this association was only sampled at Moccasin Bend.

**Global Range:** This alliance is found throughout the Piedmont of the southeastern United States and ranges into part of the Cumberland Plateau, Interior Low Plateau, Inner Coastal Plain, and the Southern Blue Ridge. It is known to occur in Alabama, Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Virginia, and may possibly range into Mississippi.

**Nations:** US

**States/Provinces:** AL, GA, KY, MS?, NC, SC, TN, VA

**USFS Ecoregions:** 221Hc:CCC, 221He:CCC, 222Eb:CCC, 231B:CC, 232:?, M221Dc:???, M221Dd:???

**Federal Lands:** DOD (Arnold, Fort Gordon, Fort Stewart?); NPS (Chickamauga-Chattanooga); USFS (Chattahoochee, Chattahoochee (Piedmont), Chattahoochee (Southern Blue Ridge), Cherokee, Daniel Boone, Land Between the Lakes?, Nantahala?, Pisgah?, Uwharrie?)

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.50.

**Local Description Authors:** T. Govus

**Global Description Authors:** M. Pyne

**References:** Allard 1990, Eyre 1980, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

### **Mid- to Late-Successional Loblolly Pine - Sweetgum Forest**

*Pinus taeda* - *Liquidambar styraciflua* Semi-natural Forest

Loblolly Pine - Sweetgum Semi-natural Forest

Identifier: CEGL008462

#### **NVC Classification**

Physiognomic Class	Forest (I)
Physiognomic Subclass	Evergreen forest (I.A.)
Physiognomic Group	Temperate or subpolar needle-leaved evergreen forest (I.A.8.)
Physiognomic Subgroup (I.A.8.N.)	Natural/Semi-natural temperate or subpolar needle-leaved evergreen forest
Formation (I.A.8.N.b.)	Rounded-crowned temperate or subpolar needle-leaved evergreen forest
Alliance	<i>Pinus taeda</i> Forest Alliance (A.130)
Alliance (English name)	Loblolly Pine Forest Alliance
Association	<i>Pinus taeda</i> - <i>Liquidambar styraciflua</i> Semi-natural Forest
Association (English name)	Loblolly Pine - Sweetgum Semi-natural Forest
Association (Common name)	Mid- to Late-Successional Loblolly Pine - Sweetgum Forest
<b>Ecological System(s):</b>	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest (CES203.506)

#### ELEMENT CONCEPT

**Global Summary:** This community type is broadly defined to accommodate mid- to late-successional upland forests strongly codominated by *Pinus taeda* and *Liquidambar styraciflua*, resulting from past disturbance (such as agricultural or other land clearing). Understory composition differs based on edaphic site and on age and history. This broadly defined type occupies a variety of edaphic sites, ranging from mesic through dry-mesic sites on a wide variety of (generally acidic) soils. If left unmanaged or undisturbed, this can be a short-lived forest type, which is likely to succeed with greater age into various oak- and oak-pine-dominated forests.

#### ENVIRONMENTAL DESCRIPTION

##### **USFWS Wetland System:**

**Chickamauga-Chattanooga National Military Park Environment:** Sites range from disturbed and filled wetland bottomlands to successional slopes on well-drained bluffs derived from sandstone. Elevations range from 200 to 244 m (660-800 feet).

**Global Environment:** Stands of this community type are strongly codominated by *Pinus taeda* and *Liquidambar styraciflua*, resulting from past disturbance followed by forest succession. This community type is more influenced by past land-use history than by specific soil differences. However, this community type tends to occur on poorly drained and low-nutrient soils, especially in areas that were farmed heavily in the past.

### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** Stands have a canopy largely dominated by *Pinus taeda* and *Liquidambar styraciflua*. Other minor canopy and subcanopy species include *Pinus virginiana*, *Quercus phellos*, *Quercus nigra*, *Quercus velutina*, and *Liriodendron tulipifera*. *Salix nigra* occurs in bottomland examples, while *Celtis occidentalis* occurs in upland types. The exotic shrub *Ligustrum sinense* is present in both situations. The herb layer is largely dominated by *Microstegium vimineum* with abundant vines, including *Lonicera japonica*, *Toxicodendron radicans*, *Vitis rotundifolia*, and *Wisteria sinensis*.

**Global Vegetation:** Stands of this community type are strongly codominated by *Pinus taeda* and *Liquidambar styraciflua*. Some other species which may be present in stands of this association include *Quercus phellos*, *Quercus nigra*, *Ulmus alata*, *Acer rubrum*, *Quercus michauxii*, *Nyssa sylvatica*, and *Prunus serotina*, along with *Vitis rotundifolia*, *Toxicodendron radicans*, *Rubus argutus*, *Smilax rotundifolia*, *Eupatorium capillifolium*, *Eupatorium hyssopifolium*, *Erigeron strigosus*, *Solidago gigantea*, *Ambrosia artemisiifolia*, *Juncus effusus*, *Juncus subcaudatus*, and the exotics *Lespedeza cuneata* and *Ligustrum sinense*. Examples of this association in low-lying areas may also have a dense herbaceous layer of *Microstegium vimineum*.

### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Needle-leaved tree	<i>Pinus taeda</i>
Tree canopy	Broad-leaved deciduous tree	<i>Liriodendron tulipifera</i> , <i>Quercus nigra</i>

#### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Needle-leaved tree	<i>Pinus taeda</i>
Tree canopy	Broad-leaved deciduous tree	<i>Liquidambar styraciflua</i>

### CHARACTERISTIC SPECIES

#### Chickamauga-Chattanooga National Military Park:

Global:

### OTHER NOTEWORTHY SPECIES

#### Chickamauga-Chattanooga National Military Park:

Global:

### CONSERVATION STATUS RANK

**Global Rank & Reasons:** GNA (modified/managed) (20-Oct-2000). This forest represents early successional or silviculturally managed vegetation and is thus not of conservation concern and does not receive a conservation status rank.

### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 1 - Strong

#### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** This community likely occurs along the northern periphery of the Gulf Coast Prairies and Marshes Ecoregion of eastern Texas and along the Coastal Plain in Maryland (Chesapeake Bay Lowlands).

#### Global Similar Associations:

*Liriodendron tulipifera* - *Pinus taeda* Forest (CEGL007521)--with greater dominance by *Liriodendron*.

*Pinus echinata* Early-Successional Forest (CEGL006327)

*Pinus taeda* - (*Pinus echinata*) - *Quercus falcata* - *Carya texana* / *Vaccinium arboreum* Forest (CEGL007528)--overlaps only in the western part of the range of this type.

*Pinus taeda* / *Liquidambar styraciflua* - *Acer rubrum* var. *rubrum* / *Vaccinium stamineum* Forest (CEGL006011)--is very similar and may need to be merged with this concept someday. For now, the main difference is that

CEGL006011 does not have *Liquidambar styraciflua* present in the canopy but instead in the subcanopy/tall-shrub layer.

*Pinus taeda* / *Saccharum alopecuroidum* - (*Andropogon* spp.) Forest (CEGL007109)--a related *Pinus taeda*-dominated type placed in evergreen.

*Pinus virginiana* Successional Forest (CEGL002591)

#### Global Related Concepts:

IF3a. Recently Harvested Timber Land (Allard 1990) B

IF3b. Plantation (Hardwood or Conifer) (Allard 1990) B

Loblolly Pine - Hardwood (13) (USFS 1988) ?

Loblolly Pine - Hardwood: 82 (Eyre 1980) B

T1B3aIII6a. *Pinus taeda* - *Liquidambar styraciflua* (Foti et al. 1994) ?

#### OTHER COMMENTS

#### Other Comments:

#### ELEMENT DISTRIBUTION

**Chickamauga-Chattanooga National Military Park Range:** To date, this association has only been sampled at Moccasin Bend. It could potentially occur at Lookout Mountain or Chickamauga Battlefield.

**Global Range:** This altered forest type is widespread in the lowland portions of the southeastern United States, particularly on the Coastal Plain, but also on adjacent inland provinces.

**Nations:** US

**States/Provinces:** AL, AR, DE, GA, LA, MD, MS, NC, OK, SC, TN, TX, VA

**USFS Ecoregions:** 231Aa:CCC, 231Ab:CCC, 231Ac:CCC, 231Ad:CCC, 231Ae:CCC, 231Af:CCC, 231Fa:CPP, 232Ac:CCC, 232Bm:CCC, 232Bx:CCC, 232Cb:CCC, 232F:CC, 255Da:PPP

**Federal Lands:** DOD (Fort Benning?); NPS (Chickamauga-Chattanooga, Guilford Courthouse, Kings Mountain, Little River Canyon?, Natchez Trace, Ninety Six, Shiloh); USFS (Angelina, Bienville, Conecuh?, Croatan, Davy Crockett, Kisatchie, Oconee, Ouachita, Ouachita (Coastal Plain), Ouachita (Mountains), Sabine NF, Sam Houston, Talladega, Talladega (Oakmulgee), Talladega (Talladega), Tuskegee?, Uwharrie); USFWS (Blackwater, Chesapeake Marshlands, Prime Hook)

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.44, CHCH.49.

**Local Description Authors:** T. Govus

**Global Description Authors:** A.S. Weakley, mod. R. White and E. Largay

**References:** Allard 1990, Eyre 1980, Foti 1994b, Foti et al. 1994, Harcombe and Neaville 1977, Hoagland 2000, NatureServe Ecology - Southeastern U.S. unpubl. data, Peet et al. unpubl. data 2002, Schotz pers. comm., Southeastern Ecology Working Group n.d., USFS 1988, Zandoni et al. 1979

#### Interior Mid- to Late-Successional Loblolly Forest

*Pinus taeda* - *Liriodendron tulipifera* / *Acer saccharum* Successional Forest

Loblolly Pine - Tuliptree / Sugar Maple Successional Forest

Identifier: CEGL007105

#### NVC Classification

Physiognomic Class	Forest (I)
Physiognomic Subclass	Evergreen forest (I.A.)
Physiognomic Group	Temperate or subpolar needle-leaved evergreen forest (I.A.8.)

Physiognomic Subgroup (I.A.8.N.)	Natural/Semi-natural temperate or subpolar needle-leaved evergreen forest
Formation (I.A.8.N.b.)	Rounded-crowned temperate or subpolar needle-leaved evergreen forest
Alliance	<i>Pinus taeda</i> Forest Alliance (A.130)
Alliance (English name)	Loblolly Pine Forest Alliance
Association	<i>Pinus taeda</i> - <i>Liriodendron tulipifera</i> / <i>Acer saccharum</i> Successional Forest
Association (English name)	Loblolly Pine - Tuliptree / Sugar Maple Successional Forest
Association (Common name)	Interior Mid- to Late-Successional Loblolly Forest

**Ecological System(s):****ELEMENT CONCEPT**

**Global Summary:** This successional forest dominated by *Pinus taeda* has low levels of hardwoods present in the overstory and a potentially well-developed subcanopy. *Liriodendron tulipifera* and/or *Acer saccharum* (or *Acer barbatum* within its range) are characteristic species of this community that broadly indicate stands found in the most interior portions of the range of *Pinus taeda* in the southeastern United States; more southerly stands with *Liquidambar styraciflua* are covered by another association [see *Pinus taeda* - *Liquidambar styraciflua* Semi-natural Forest (CEGL008462)]. *Liriodendron tulipifera* may reach the canopy but generally comprises less than 25% of total cover. A variety of other canopy and subcanopy species may be possible, and some examples lack tuliptree. Examples over limestone may include *Fraxinus americana*, *Celtis laevigata*, or *Ulmus* sp. The herbaceous and shrub strata may contain *Toxicodendron radicans*, *Smilax rotundifolia*, *Goodyera pubescens*, *Chimaphila maculata*, *Galium circaezans*, *Galium pilosum*, *Parthenocissus quinquefolia*, *Polystichum acrostichoides*, *Pleopeltis polypodioides*, *Matelea* sp., and *Vaccinium* spp.

**ENVIRONMENTAL DESCRIPTION****USFWS Wetland System:**

**Chickamauga-Chattanooga National Military Park Environment:** This association has only been documented once in the park but could potentially occur throughout in habitats that have been logged or cleared. The site documented is along a mesic flat adjacent to a stream corridor on moderately well-drained soils.

**Global Environment:** This upland community occurs in areas formerly cut, then cultivated or grazed and abandoned. It often occurs outside the native range of loblolly pine and is a result of reforestation or replanting efforts. Stands are generally between 30 and 70 years old and tend to convert to oak, maple, and/or tuliptree domination as the stand approaches greater age.

**VEGETATION DESCRIPTION**

**Chickamauga-Chattanooga National Military Park Vegetation:** In the example studied, the canopy is strongly dominated by *Pinus taeda* but also includes *Fraxinus americana*, *Carya carolinae-septentrionalis*, *Pinus echinata*, and *Quercus stellata*. *Celtis laevigata* dominates the understory along with *Acer barbatum*, *Morus rubra*, and *Ulmus rubra*. The shrub layer is dominated by the exotic *Ligustrum sinense* but also includes *Cercis canadensis*. The herb layer is moderately developed with *Conoclinium coelestinum* and *Carex cherokeensis* most prominent. Vine species in this example include *Berchemia scandens* and *Campsis radicans*.

**Global Vegetation:** Examples are strongly dominated by *Pinus taeda*. The canopy also includes some hardwoods, but generally less than 25% of the total cover. In addition to *Liriodendron tulipifera*, a variety of other canopy species are possible. Other woody species documented in plots include *Acer rubrum*, *Prunus serotina* var. *serotina*, *Quercus velutina*, *Juniperus virginiana* var. *virginiana*, *Cornus florida*, and *Carya* spp. (NatureServe Ecology unpubl. data).

**MOST ABUNDANT SPECIES****Chickamauga-Chattanooga National Military Park**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Needle-leaved tree	<i>Pinus taeda</i>
Tree canopy	Broad-leaved deciduous tree	<i>Fraxinus americana</i>
Tree subcanopy	Broad-leaved deciduous tree	<i>Acer barbatum</i> , <i>Celtis laevigata</i>

**Global****Stratum**

Tree canopy

**Lifeform**

Needle-leaved tree

**Species***Pinus taeda***CHARACTERISTIC SPECIES****Chickamauga-Chattanooga National Military Park:** *Fraxinus americana*, *Pinus taeda***Global:****OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:****Global:****CONSERVATION STATUS RANK****Global Rank & Reasons:** GNA (modified/managed) (22-Dec-2000). This is a successional forest. It is composed of species that are native to the southeastern United States. However, this community does exist outside the original native range of *Pinus taeda* and therefore could be considered an exotic-dominated type.**CLASSIFICATION****Status:** Standard**Classification Confidence:** 3 - Weak**Chickamauga-Chattanooga National Military Park Comments:****Global Comments:** Originally described from the work of Andreu and Tukman (1995), the bulk of their examples were found on low slopes or stream bottoms (Ridge and Valley of Tennessee from Tellico Pilot Project; northeastern Monroe County, Tennessee; 19 stands sampled). On the Bankhead National Forest in the Cumberland Plateau of northern Alabama, this association is found on streamside terraces that are presumed to have been previously farmed. More work needs to be done to determine the range of this type. This community is distinguished from other successional pine types by its presence in the Interior Low Plateau and Upper East Gulf Coastal Plain.**Global Similar Associations:***Pinus taeda* / *Liquidambar styraciflua* - *Acer rubrum* var. *rubrum* / *Vaccinium stamineum* Forest (CEGL006011)--of the Piedmont and related areas.*Pinus taeda* / *Schizachyrium scoparium* - *Tephrosia virginiana* Forest (CEGL007110)--consists of a more diverse and less "successional" understory.*Pinus taeda* Planted Forest (CEGL007179)--applies to young, dense, monospecific, stands with plantation structure (rows of trees).**Global Related Concepts:****OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION****Chickamauga-Chattanooga National Military Park Range:** This association has only been sampled once at Chickamauga Battlefield but could potentially occur throughout in habitats that have been logged or cleared.**Global Range:** This association is known from the Southern Ridge and Valley of Tennessee and the Cumberland Plateau of Alabama. It is also found in northern Georgia in areas peripheral to these ecoregions, as well as the Interior Low Plateau and the Upper East Gulf Coastal Plain of Tennessee.**Nations:** US**States/Provinces:** AL, GA, TN**USFS Ecoregions:** 221Jb:CCC, 222Eg:CCC, 231Cd:CCC

**Federal Lands:** NPS (Chickamauga-Chattanooga, Fort Donelson); TVA (Tellico); USFS (Bankhead, Chattahoochee, Chattahoochee (Southern Blue Ridge))

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.09.

**Local Description Authors:** T. Govus

**Global Description Authors:** M. Andreu and M. Tukman, mod. M. Pyne and R.E. Evans

**References:** Andreu and Tukman 1995, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

### Appalachian Low-Elevation Mixed Pine / Hillside Blueberry Forest

*Pinus virginiana* - *Pinus (rigida, echinata)* - (*Quercus prinus*) / *Vaccinium pallidum* Forest

Virginia Pine - (Pitch Pine, Shortleaf Pine) - (Chestnut Oak) / Hillside Blueberry Forest

Identifier: CEGL007119

#### NVC Classification

Physiognomic Class	Forest (I)
Physiognomic Subclass	Evergreen forest (I.A.)
Physiognomic Group	Temperate or subpolar needle-leaved evergreen forest (I.A.8.)
Physiognomic Subgroup (I.A.8.N.)	Natural/Semi-natural temperate or subpolar needle-leaved evergreen forest
Formation (I.A.8.N.b.)	Rounded-crowned temperate or subpolar needle-leaved evergreen forest
Alliance	<i>Pinus virginiana</i> Forest Alliance (A.131)
Alliance (English name)	Virginia Pine Forest Alliance
Association	<i>Pinus virginiana</i> - <i>Pinus (rigida, echinata)</i> - ( <i>Quercus prinus</i> ) / <i>Vaccinium pallidum</i> Forest
Association (English name)	Virginia Pine - (Pitch Pine, Shortleaf Pine) - (Chestnut Oak) / Hillside Blueberry Forest
Association (Common name)	Appalachian Low-Elevation Mixed Pine / Hillside Blueberry Forest

<b>Ecological System(s):</b>	Cumberland Sandstone Glade and Barrens (CES202.337)
	Central Interior Highlands Dry Acidic Glade and Barrens (CES202.692)
	Southern Appalachian Montane Pine Forest and Woodland (CES202.331)
	Southern Appalachian Low-Elevation Pine Forest (CES202.332)
	Central Appalachian Dry Oak-Pine Forest (CES202.591)
	Cumberland Acidic Cliff and Rockhouse (CES202.309)

#### ELEMENT CONCEPT

**Global Summary:** This community includes *Pinus virginiana*-dominated forests of low-elevation ridges and steep upper slopes, occurring primarily in the Appalachian provinces of the eastern United States, from central Pennsylvania, south and west to northern Georgia and northern Alabama. This community occurs on narrow ridges, steep slopes, and other exposed topographic positions, over shallow, infertile soils. This mainly evergreen forest is often of low stature, with a somewhat open to closed canopy, sparse to very dense shrub cover dominated by ericaceous species, and a sparse herb stratum. *Pinus virginiana* is the canopy dominant throughout the range of the type. In some parts of the range, other *Pinus* species may be significant canopy associates, as well as dry-site *Quercus* species (e.g., *Quercus prinus*, *Quercus coccinea*). Deciduous species may form a subcanopy or sapling stratum, particularly in areas where fire has been excluded. Common shrub dominants include *Vaccinium pallidum*, *Vaccinium stamineum*, *Gaylussacia baccata*, and *Kalmia latifolia*. Herbs vary with geography but are typical of infertile, xeric habitats. Some typical herbs in this forest are *Baptisia tinctoria*, *Chimaphila maculata*,

*Dichanthelium commutatum*, *Epigaea repens*, *Euphorbia corollata*, *Galax urceolata*, *Gaultheria procumbens*, *Hypoxis hirsuta*, *Iris verna*, *Pityopsis graminifolia* var. *latifolia*, *Pteridium aquilinum* var. *latiusculum*, and *Schizachyrium scoparium*.

## ENVIRONMENTAL DESCRIPTION

### USFWS Wetland System:

#### Chickamauga-Chattanooga National Military Park Environment:

**Global Environment:** Stands of this forest occur on narrow ridges and knobs, steep upper slopes, bluff and cliff tops, and other exposed sites throughout the range of the type. The community is found primarily on south-, southeast- or southwest-facing aspects on excessively drained, shallow soils. In the Blue Ridge Escarpment region, the western margin of the Blue Ridge, and west into the Ridge and Valley and Cumberland Mountains, this xeric forest occurs on convex slopes and ridges below 850 m (2800 feet) elevation, over soils classed as Inceptisols, typically Lithic Dystrochrepts originating from sandstone, shale and other noncalcareous parent material. Occurrences in rugged parts of the western Piedmont are also likely. Its environmental situation in the western Alleghenies is not known. In the Interior Low Plateau of Kentucky, Tennessee, and Indiana, this association occurs in edaphically extreme situations, including bluff tops and narrow ridges in thin soils weathered from relatively acidic caprocks with southern and western aspects, as well as other similar slopes, over cherty limestone, siltstones, sandstones, and shales. In particular, in the Knobstone Escarpment Subsection (a few Indiana counties just north of Louisville, Kentucky), it occurs in gladelike situations on steep slopes with thin soils. Along the edges of cliff tops, there is usually a narrow zone of exposed bedrock pavement and patches of very shallow soil, but soils become progressively deeper back from the cliff edge. At least in West Virginia, portions of the stands along the cliff edge are likely to be edaphic climax communities, but farther back from the edge, they are likely to be successional following fire.

## VEGETATION DESCRIPTION

#### Chickamauga-Chattanooga National Military Park Vegetation:

**Global Vegetation:** This community is a needle-leaved evergreen forest with a usually somewhat open (occasionally closed) canopy. The canopy is typically short (<20 m) with tree height and canopy cover decreasing with increasing severity of the microsite. A deciduous subcanopy may be present, especially in areas where fire has been excluded. The shrub layers can be sparse but are more often dense to very dense and are composed of tall and short shrubs, predominantly ericaceous species. Herb cover is sparse, and leaf litter often dominates the ground layer. *Pinus virginiana* is the canopy dominant throughout the range of the type. In the southern Appalachians and southern Ridge and Valley it may occur with mixes of *Pinus rigida*, *Pinus echinata*, or *Pinus strobus*. Within its range, *Pinus pungens* may be present as a very minor component. Regeneration of *Pinus virginiana* is concentrated along cliff edges and tends to drop off inward from the edge. Small stems of *Quercus prinus*, *Quercus coccinea*, *Acer rubrum*, *Nyssa sylvatica*, and *Oxydendrum arboreum* are common in the subcanopy and sapling strata, particularly in areas where fire has been excluded, and may occur in the canopy as well. In the Southern Blue Ridge/Piedmont and Southern Blue Ridge/Ridge and Valley transition regions, *Quercus marilandica*, *Quercus falcata*, and *Quercus stellata* can be deciduous components. Common shrub dominants include *Vaccinium pallidum*, *Vaccinium stamineum*, *Gaylussacia baccata*, and *Kalmia latifolia*. Other typical shrubs can include *Gaylussacia ursina*, *Kalmia latifolia*, *Sassafras albidum*, and *Vaccinium hirsutum* (southwestern North Carolina and southeastern Tennessee only). *Smilax glauca* and *Smilax rotundifolia* can be common vines. In the sparse herb layer, characteristic species from the Southern Blue Ridge and Southern Ridge and Valley include *Baptisia tinctoria*, *Chimaphila maculata*, *Dichanthelium commutatum*, *Danthonia spicata*, *Epigaea repens*, *Euphorbia corollata*, *Galax urceolata*, *Gaultheria procumbens*, *Hypoxis hirsuta*, *Iris verna*, *Pityopsis graminifolia* var. *latifolia*, *Pteridium aquilinum* var. *latiusculum*, and *Schizachyrium scoparium*. Typical herbs from examples in the western portion of the range (Interior Low Plateau) include *Antennaria plantaginifolia*, *Antennaria solitaria*, *Carex albicans* var. *albicans* (= *Carex artitecta*), *Danthonia spicata*, *Dichanthelium dichotomum*, *Lespedeza violacea* (= *Lespedeza intermedia*), *Hieracium gronovii*, *Hieracium venosum*, *Krigia biflora*, *Solidago erecta*, and *Tephrosia virginiana* (M. Homoya pers. comm. 1999). In some of these examples *Opuntia humifusa*, *Calamagrostis porteri* ssp. *insperata*, and *Solidago squarrosa* may occur locally.

**MOST ABUNDANT SPECIES****Chickamauga-Chattanooga National Military Park**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
<b>Global</b>		
<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Needle-leaved tree	<i>Pinus virginiana</i>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus prinus</i>
Tall shrub/sapling	Broad-leaved evergreen shrub	<i>Kalmia latifolia</i>
Short shrub/sapling	Broad-leaved deciduous shrub	<i>Gaylussacia baccata</i> , <i>Vaccinium pallidum</i> , <i>Vaccinium stamineum</i>

**CHARACTERISTIC SPECIES****Chickamauga-Chattanooga National Military Park:**

**Global:** *Comptonia peregrina*, *Epigaea repens*, *Gaultheria procumbens*, *Pinus virginiana*, *Pteridium aquilinum*, *Sassafras albidum*

**OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:**

**Global:** *Buckleya distichophylla*, *Calamagrostis porteri* ssp. *insperata*, *Cleistes bifaria*, *Penstemon deamii*, *Thermopsis villosa*, *Vaccinium hirsutum*

**CONSERVATION STATUS RANK**

**Global Rank & Reasons:** G4? (11-Feb-2001). This xeric evergreen forest community will be maintained on sites where local soil conditions, topographic extremes, or occasional fire function to retard hardwood invasion. Infestations of southern pine beetle (*Dendroctonus frontalis*) can cause mortality of canopy trees. Examples affected by southern pine beetle in the Great Smoky Mountains can have up to 80-90% standing dead pine.

**CLASSIFICATION**

**Status:** Standard

**Classification Confidence:** 1 - Strong

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** Some vegetation formerly placed (at least conceptually) in the *Pinus virginiana* - *Quercus coccinea*, *pinus*) Forest Alliance (A.408) has been transferred here, with this association (CEGL007119) becoming more geographically inclusive. In Indiana examples, the substrate is primarily a matrix of acidic siltstone, shale, and sandstone. Rarely are cliffs formed; instead the setting is mostly very steep slopes with high hills and deep ravines. This association also includes vegetation from the transition between the Cumberland Plateau / Southern Ridge and Valley and the Upper East Gulf Coastal Plain in Alabama. Though located in the Coastal Plain, these occurrences are physiographically and floristically similar to this montane association.

Early-successional vegetation associated with old fields, old pastures, clearcuts, and burned or eroded areas and dominated by *Pinus virginiana* is classified as *Pinus virginiana* Successional Forest (CEGL002591). Appalachian xeric oak forests with similar floristics, but with a mainly deciduous canopy, are classed in *Quercus (pinus, coccinea) / Kalmia latifolia / (Galax urceolata, Gaultheria procumbens)* Forest (CEGL006271). Appalachian shale forests and woodlands with *Pinus virginiana* occur on steep, shaly slopes and have stunted canopies and sparse herb and shrub strata, characterized by species adapted to shaly substrates. These shale communities are classed in *Pinus virginiana - Quercus (coccinea, pinus)* Forest Alliance (A.408) and *Pinus (rigida, pungens, virginiana) - Quercus prinus* Woodland Alliance (A.677).

**Global Similar Associations:**

*Pinus (rigida, echinata) - Quercus coccinea / Ilex opaca* Woodland (CEGL006115)

*Pinus echinata* Early-Successional Forest (CEGL006327)

*Pinus pungens - Pinus rigida - (Quercus prinus) / Kalmia latifolia - Vaccinium pallidum* Woodland (CEGL007097)

*Pinus virginiana - (Pinus rigida, Pinus pungens) / Schizachyrium scoparium* Forest (CEGL008500)

*Pinus virginiana* - *Quercus falcata* - *Carya pallida* Forest (CEGL006354)

*Pinus virginiana* / *Quercus marilandica* Serpentine Forest (CEGL006266)

*Pinus virginiana* Successional Forest (CEGL002591)--is distinguished from this community by differences in land-use history; CEGL002591 exists in flat to moderately sloping land that was heavily plowed in the recent past (10-60 years), whereas this community is generally a product of less disturbed soils and more historic disturbance by fire or logging without plowing.

*Quercus (prinus, coccinea) / Kalmia latifolia / (Galax urceolata, Gaultheria procumbens)* Forest (CEGL006271)

*Quercus prinus* - *Quercus (alba, coccinea, velutina) / Viburnum acerifolium* - (*Kalmia latifolia*) Forest (CEGL005023)

#### Global Related Concepts:

*Pinus virginiana* - (*Quercus* spp.) / *Nyssa sylvatica* / *Gaultheria procumbens* forest (Vanderhorst 2002b) =

*Pinus virginiana* - *Quercus prinus* - *Nyssa sylvatica* Forest (Walton et al. 1997) ?

IA7c. Xeric Virginia Pine Ridge Forest (Allard 1990) B

Low Mountain Pine Forest (Montane Pine Subtype) (Schafale 1998b) ?

Oligotrophic Forest (Rawinski 1992) B

Virginia Pine - Mixed Oaks, HR (Pyne 1994) B

Virginia Pine - Oak: 78 (Eyre 1980) B

Virginia Pine Type (Schmalzer and DeSelm 1982) B

Virginia Pine, BR, R&V, CUPL (Pyne 1994) B

Virginia Pine: 79 (Eyre 1980) B

Virginia pine forest (CAP pers. comm. 1998) ?

Xeric Pine Forest, Pine - Heath Ridge Forest (Ambrose 1990a) B

#### OTHER COMMENTS

#### Other Comments:

#### ELEMENT DISTRIBUTION

#### Chickamauga-Chattanooga National Military Park Range:

**Global Range:** This community occurs primarily in the Appalachian region of the United States, ranging from central Pennsylvania, south and west through the Ridge and Valley, Blue Ridge, and Cumberland Plateau to northern Georgia and Alabama, extending westward to scattered areas in the Interior Low Plateau and eastward into the upper Piedmont. It is recorded from the states of Georgia, North Carolina, South Carolina, Tennessee, Kentucky, Pennsylvania, Indiana, Ohio, Maryland, Virginia, and West Virginia.

**Nations:** US

**States/Provinces:** AL, GA, IN, KY, MD, NC, OH, PA, SC, TN, VA, WV

**USFS Ecoregions:** 221Ea:CC?, 221Eb:CCC, 221Ec:CCC, 221Ed:CCP, 221Ef:CCC, 221Eg:CCC, 221Ha:CCC, 221Hc:CCC, 221He:CCC, 221Ja:CCC, 221Jb:CCC, 222Da:CCC, 222Dc:CCC, 222Dg:CCC, 222Dj:CCC, 222Eg:CCC, 222Ej:CCC, 222El:CCC, 222En:CCC, 222Eo:CCC, 222Fd:CCC, 222Ff:CCC, 231Aa:CCC, 231Ab:CCC, 231Ae:CCC, 231Bc:CCC, 231Cd:CCC, 231Da:CCC, 231Dc:CCC, M221Aa:CCP, M221Ab:CCC, M221Ac:CCC, M221Bb:CCC, M221Bd:CCP, M221Be:CCP, M221Cb:CCC, M221Cd:CCC, M221Dc:CCC, M221Dd:CCC

**Federal Lands:** NPS (Big South Fork, Blue Ridge Parkway, Chickamauga-Chattanooga, Great Smoky Mountains, Kennesaw Mountain, Kings Mountain?, Little River Canyon?, Mammoth Cave, New River Gorge, Obed); USFS (Bankhead, Chattahoochee, Chattahoochee (Piedmont), Chattahoochee (Southern Blue Ridge), Cherokee, Daniel Boone, Land Between the Lakes?, Nantahala, Pisgah, Sumter, Sumter (Mountains), Sumter (Piedmont), Talladega, Talladega (Oakmulgee), Talladega (Talladega))

#### ELEMENT SOURCES

#### Chickamauga-Chattanooga National Military Park Inventory Notes:

#### Chickamauga-Chattanooga National Military Park Plots:

#### Local Description Authors:

**Global Description Authors:** K.D. Patterson, mod. R. White and S.C. Gawler

**References:** Allard 1990, Ambrose 1990a, Barden 1977, Burns and Honkala 1990a, CAP pers. comm. 1998, Cooper 1963, Core 1966, Evans 1991, Eyre 1980, Fike 1999, Gettman 1974, Harrison 2004, Homoya pers. comm., Malter 1977, Maxwell 2006, NatureServe Ecology - Southeastern U.S. unpubl. data, Nelson 1986, Patterson et al. 1999, Peet et al. unpubl. data 2002, Pyne 1994, Racine 1966, Rawinski 1992, Schafale 1998b, Schafale and Weakley 1990, Schmalzer and DeSelm 1982, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, Vanderhorst 2002b, Vanderhorst 2007, Walton et al. 1997, Whittaker 1956

### **Red-cedar Successional Forest**

*Juniperus virginiana* var. *virginiana* - (*Quercus* spp.) Forest

Eastern Red-cedar - (Oak species) Forest

Identifier: CEGL007124

### **NVC Classification**

Physiognomic Class	Forest (I)
Physiognomic Subclass	Evergreen forest (I.A.)
Physiognomic Group	Temperate or subpolar needle-leaved evergreen forest (I.A.8.)
Physiognomic Subgroup (I.A.8.N.)	Natural/Semi-natural temperate or subpolar needle-leaved evergreen forest
Formation (I.A.8.N.c.)	Conical-crowned temperate or subpolar needle-leaved evergreen forest
Alliance	<i>Juniperus virginiana</i> Semi-natural Forest Alliance (A.137)
Alliance (English name)	Eastern Red-cedar Forest Alliance
Association	<i>Juniperus virginiana</i> var. <i>virginiana</i> - ( <i>Quercus</i> spp.) Forest
Association (English name)	Eastern Red-cedar - (Oak species) Forest
Association (Common name)	Red-cedar Successional Forest
<b>Ecological System(s):</b> (CES203.482)	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland  East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest (CES203.506) Southern Interior Low Plateau Dry-Mesic Oak Forest (CES202.898) Southern Ridge and Valley / Cumberland Dry Calcareous Forest (CES202.457) East Gulf Coastal Plain Limestone Forest (CES203.502)

### **ELEMENT CONCEPT**

**Global Summary:** This is a successional community dominated by a nearly monospecific *Juniperus virginiana* var. *virginiana* canopy. Species composition and cover are variable depending upon geographic location and disturbance history. Some examples are densely forested (75-100% total cover) with *Juniperus virginiana* var. *virginiana* and sparse subcanopy, shrub and herb strata. Other examples, especially those that are somewhat more open-canopied, are more species-rich and other tree species may enter the canopy in low levels of abundance. Species that may occur in the canopy include *Carya alba*, *Carya caroliniae-septentrionalis*, *Carya ovata*, *Cercis canadensis*, and *Pinus virginiana*. Various oaks (including *Quercus coccinea*, *Quercus falcata*, *Quercus stellata*, and *Quercus phellos*) may also be present, seeding in from adjacent oak-hardwood forests. The midstory is typically sparse, with canopy species as well as *Cornus florida*, *Ilex opaca*, *Liquidambar styraciflua*, and *Prunus serotina* var. *serotina*. In addition, *Frangula caroliniana* occurs in various strata. Herbs are patchy and typically include *Asplenium platyneuron*, *Chasmanthium laxum*, *Eupatorium* spp., *Polystichum acrostichoides*, and *Carex* spp.

### **ENVIRONMENTAL DESCRIPTION**

#### **USFWS Wetland System:**

**Chickamauga-Chattanooga National Military Park Environment:** This association is documented from a well-drained slope with a northerly aspect over dolomitic limestones of the Knox Group. The elevation is approximately 225 m (740 feet). It could potentially occur in a wide variety of environmental situations.

**Global Environment:** This community occurs in both coastal plain and interior regions of the southeastern United States in a variety of disturbed areas such as eroded soils on abandoned agricultural land (Andreu and Tukman 1995). In Kentucky, this vegetation occurs throughout the state (Bluegrass region, Highland Rim, East Gulf Coastal Plain) on calcareous substrates or on abandoned agricultural land; acreage of this type has increased since presettlement times. This type also includes the *Juniperus virginiana* var. *virginiana* woodland from Tellico Lake (Andreu and Tukman 1995) which occurs on drier sites with shallow, rocky soils.

#### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** The example studied is strongly dominated by *Juniperus virginiana*, occurring in nearly all strata. A large number of widely scattered dead pine trees are also present (*Pinus taeda*, *Pinus echinata*, *Pinus virginiana*). Other important canopy and subcanopy species are *Carya carolinae-septentrionalis*, *Quercus stellata*, *Cercis canadensis*, and *Fraxinus americana*. The shrub layer is sparse and made up of transgressive species from the canopy along with *Frangula caroliniana* and *Celtis tenuifolia*. The herbaceous layer is sparse but diverse and includes *Salvia urticifolia*, *Schizachyrium scoparium*, *Salvia lyrata*, *Opuntia humifusa*, and *Danthonia spicata*.

**Global Vegetation:** Stands are dominated by *Juniperus virginiana* var. *virginiana*. A host of other woody species may also be present, some of which may occur in the canopy at low levels of abundance. These species include *Carya alba*, *Carya ovata*, *Cercis canadensis*, *Pinus virginiana*, *Quercus coccinea*, *Quercus falcata*, and *Quercus phellos*. The midstory is typically sparse, with canopy species as well as *Cornus florida*, *Ilex opaca*, *Liquidambar styraciflua*, and *Prunus serotina* var. *serotina* (NatureServe Ecology unpubl. data). In addition, *Frangula caroliniana* occurs in various strata. Herbs are patchy and typically include *Asplenium platyneuron*, *Chasmanthium laxum*, *Eupatorium* spp., *Polystichum acrostichoides*, and *Carex* spp. The ground layers of some stands may exhibit dominance by native warm-season grasses and other graminoids, including *Schizachyrium scoparium*, *Andropogon* spp., and *Danthonia* spp. The exotics *Lonicera japonica* and *Microstegium vimineum* may also be present.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Needle-leaved tree	<i>Juniperus virginiana</i> var. <i>virginiana</i>

##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree subcanopy	Needle-leaved tree	<i>Juniperus virginiana</i> var. <i>virginiana</i>

#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Carya carolinae-septentrionalis*, *Frangula caroliniana*, *Quercus stellata*

**Global:**

#### OTHER NOTEWORTHY SPECIES

**Chickamauga-Chattanooga National Military Park:**

**Global:**

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** GNA (ruderal) (3-Sep-2002). This forest represents early-successional, modified, or silviculturally managed vegetation and is thus not of conservation concern and does not receive a conservation status rank.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 3 - Weak

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** Originally described from Tellico Pilot Project (Ridge and Valley of Tennessee, northeastern Monroe County) based on 10 stands sampled by Andreu and Tukman (1995). This community is very closely related to *Juniperus virginiana* Woodland and to mixed juniper-oak forest types but is distinguished by the closed-canopy evergreen dominance of *Juniperus virginiana*. *Juniperus virginiana* woodlands may be equivalent to this type.

**Global Similar Associations:**

*Juniperus virginiana* Midwest Forest (CEGL002593)

*Juniperus virginiana* var. *virginiana* / *Rhus copallinum* / *Schizachyrium scoparium* Woodland (CEGL007704)

**Global Related Concepts:**

Eastern Redcedar: 46 (Eyre 1980) B

IB5a. Eastern Red Cedar Woodland (Allard 1990) ?

Red cedar, RV (Pyne 1994) B

**OTHER COMMENTS**

**Other Comments:**

**ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This association was only documented once at Chickamauga but could potentially occur throughout the battlefield on calcareous substrates.

**Global Range:** This community is widely distributed in both coastal plain and interior regions of the southeastern United States, ranging in the interior to Oklahoma, Kentucky, and West Virginia.

**Nations:** US

**States/Provinces:** AL, AR, GA, KY, LA, MS, NC, OK, SC, TN, VA, WV?

**USFS Ecoregions:** 221Hc:CCC, 222Ak:CCP, 222Cg:CCC, 222Eb:CCC, 222Ed:CCC, 222Eg:CCC, 222Ej:CCC, 222En:CCC, 222Eo:CCC, 222Lc:CCP, 222Me:CCP, 231:C, 251Cc:CC?, 251Ch:CCP, M221Be:CCC

**Federal Lands:** DOD (Arnold, Camp Gruber, J. Percy Priest); NPS (Big South Fork, Blue Ridge Parkway?, Chickamauga-Chattanooga, Chickasaw NRA, Cumberland Gap, Fort Donelson, Kings Mountain, Lincoln Birthplace, Mammoth Cave, Natchez Trace, Russell Cave, Shiloh, Stones River); TVA (Columbia, Tellico); USFS (Bankhead, Cherokee?, Daniel Boone, Ouachita (Mountains)?, Ouachita?, Ozark)

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.14.

**Local Description Authors:** T. Govus

**Global Description Authors:** K.D. Patterson, mod. M. Pyne

**References:** Allard 1990, Andreu and Tukman 1995, Evans 1991, Eyre 1980, Gallyoun et al. 1996, Hoagland 2000, NatureServe Ecology - Southeastern U.S. unpubl. data, Pyne 1994, Rice 1960, Rosson 1995, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

**Central Interior Beech - White Oak Forest**

Fagus grandifolia - Quercus alba / Cornus florida Forest

American Beech - White Oak / Flowering Dogwood Forest

Identifier: CEGL007881

**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>Fagus grandifolia</i> - <i>Quercus rubra</i> - <i>Quercus alba</i> Forest Alliance (A.229)
Alliance (English name)	American Beech - Northern Red Oak - White Oak Forest Alliance
Association	<i>Fagus grandifolia</i> - <i>Quercus alba</i> / <i>Cornus florida</i> Forest
Association (English name)	American Beech - White Oak / Flowering Dogwood Forest
Association (Common name)	Central Interior Beech - White Oak Forest
<b>Ecological System(s):</b>	South-Central Interior Mesophytic Forest (CES202.887) East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest (CES203.477)

#### ELEMENT CONCEPT

**Global Summary:** This beech-white oak forest is found in the Interior Low Plateau and the Southern Ridge and Valley of Tennessee (and possibly adjacent Georgia), the Cumberland region of Kentucky, and adjacent areas of the Upper East Gulf Coastal Plain. Stands occur on mesic mid to lower slopes in moderately dissected terrain. Stand positions vary from north-facing slopes and low slopes to high terraces along streams. The vegetation is generally dominated by *Fagus grandifolia* with more or less *Quercus alba* depending on past logging history. Associated canopy and subcanopy species can include *Acer saccharum*, *Quercus muehlenbergii*, *Acer rubrum*, *Cornus florida*, *Ostrya virginiana*, and *Ilex opaca*. Shrubs which may be present include *Vaccinium stamineum*, *Viburnum acerifolium*, *Euonymus americanus*, and, in some occurrences, *Kalmia latifolia*. The herb layer can be relatively lush with such species as *Polystichum acrostichoides*, *Galium circaeazans*, *Desmodium nudiflorum*, *Erythronium americanum*, *Hepatica nobilis* var. *obtusata*, *Epifagus virginiana*, *Tiarella cordifolia* var. *collina*, *Heuchera americana*, *Stellaria pubera*, *Podophyllum peltatum*, *Botrychium virginianum*, and others.

#### ENVIRONMENTAL DESCRIPTION

##### USFWS Wetland System:

##### Chickamauga-Chattanooga National Military Park Environment:

**Global Environment:** Stands occur on mesic mid to lower slopes in moderately dissected terrain. Stand positions vary from north-facing slopes and low slopes to more rocky stands (Franklin et al. 1993). At Land Between the Lakes, this community is restricted to deep limestone-derived soils of the Baxter Series and silty soils of the Brandon Series, generally on lower slopes with northwest, north, to southeast aspects (Franklin 1990).

#### VEGETATION DESCRIPTION

##### Chickamauga-Chattanooga National Military Park Vegetation:

**Global Vegetation:** The vegetation is dominated by at least 40% *Fagus grandifolia* with more or less *Quercus alba* depending on past logging history. Associated canopy and subcanopy species can include *Liriodendron tulipifera*, *Acer saccharum*, *Quercus pagoda*, *Quercus rubra*, *Quercus coccinea*, *Cornus florida*, *Nyssa sylvatica*, *Sassafras albidum*, and *Ostrya virginiana* (Franklin 1990, NatureServe Ecology unpubl. data). Other potential species include *Quercus muehlenbergii*, *Acer rubrum*, and *Ilex opaca*. Shrubs which may be present include *Vaccinium stamineum*, *Viburnum acerifolium*, *Euonymus americanus*, and in some occurrences, *Kalmia latifolia*. The herb layer can be relatively lush with such species as *Polystichum acrostichoides*, *Galium circaeazans*, *Desmodium nudiflorum*, *Erythronium americanum*, *Hepatica nobilis* var. *obtusata*, *Epifagus virginiana*, *Tiarella cordifolia* var. *collina*, *Heuchera americana*, *Stellaria pubera*, *Podophyllum peltatum*, *Botrychium virginianum*, and others. Campbell (2001) provides an extensive list of species for eastern Kentucky; see also NatureServe Ecology unpublished data from Fort Donelson.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Fagus grandifolia</i> , <i>Quercus alba</i>

**CHARACTERISTIC SPECIES****Chickamauga-Chattanooga National Military Park:**

**Global:** *Polystichum acrostichoides*

**OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:**

**Global:**

**CONSERVATION STATUS RANK**

**Global Rank & Reasons:** G4 (15-Dec-1999). This is not an inherently rare forest type, and many examples are still believed to be extant. The lack of element occurrences of this type does not reflect its relative abundance. Patch size may be small, but this is a somewhat widespread association (and may be merged with others as classification is resolved); many examples are still extant. Some stands have been impacted by removal of more valuable timber species (e.g., *Quercus alba*) and loss of herbaceous species diversity from the disturbance effects of logging. The Rank has been changed from G3G4 to G4 to reflect its true abundance.

**CLASSIFICATION**

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** This association is similar to *Quercus alba* - *Fagus grandifolia* / *Hydrangea quercifolia* - *Viburnum acerifolium* / *Carex picta* - *Polystichum acrostichoides* Forest (CEGL007213), found in northern Alabama, but is more broadly defined and geographically distinct from it. The associations have been kept separate until more detailed floristic and range information can be obtained for this type (CEGL007881). CEGL007881 is often less species-rich than the current concept of CEGL007213. *Fagus grandifolia* - *Liriodendron tulipifera* / *Euonymus americanus* / *Athyrium filix-femina* ssp. *aspennioides* Forest (CEGL007201) is somewhat similar but lacks codominance by *Quercus* species. Information on species from stands in eastern Kentucky is provided by Campbell (2001), who tentatively crosswalks his 5C3 to this type. Further review is needed before incorporating his description.

**Global Similar Associations:**

*Fagus grandifolia* - *Acer saccharum* - *Liriodendron tulipifera* Unglaciaded Forest (CEGL002411)

*Fagus grandifolia* - *Liriodendron tulipifera* / *Euonymus americanus* / *Athyrium filix-femina* ssp. *aspennioides* Forest (CEGL007201)

*Fagus grandifolia* Ridge and Valley Forest (CEGL007200)

*Quercus alba* - (*Liriodendron tulipifera*, *Liquidambar styraciflua*) / *Calycanthus floridus* / *Athyrium filix-femina* Forest (CEGL008428)--of the southern Ridge and Valley.

*Quercus alba* - *Fagus grandifolia* / *Hydrangea quercifolia* - *Viburnum acerifolium* / *Carex picta* - *Polystichum acrostichoides* Forest (CEGL007213)

*Quercus alba* - *Quercus rubra* - *Quercus muehlenbergii* / *Cercis canadensis* Forest (CEGL002070)

*Quercus rubra* - *Tilia americana* var. *heterophylla* - *Carya carolinae-septentrionalis* / *Acer* (*barbatum*, *leucoderme*) / *Hydrangea quercifolia* Forest (CEGL008488)

**Global Related Concepts:**

*Acer saccharum* - *Quercus alba* - *Fagus grandifolia* type (Franklin et al. 1993) ?

**OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This association was observed, but no plots were taken, at Lookout Mountain on the bluffs near Lookout Creek.

**Global Range:** This association was defined for the Interior Low Plateau of Tennessee. It ranges to the Cumberlands of Kentucky and Upper East Gulf Coastal Plain in Tennessee, but more information is needed to determine its full range. Currently the range across USFS Sections 221H, 222E, and 222C covers approximately 58,000 square km.

**Nations:** US

**States/Provinces:** AL?, GA?, IN?, KY, TN

**USFS Ecoregions:** 221Ha:CCC, 221Hc:CCC, 221He:CCC, 222Cg:CCC, 222Eb:CCP, 222Eg:CCC, 222Eh:CCP, 222Ei:CCP, 222Ek:CCP, 222Em:CCP, 222En:CCP, 222Eo:CCP, 231Cc:CCC

**Federal Lands:** NPS (Big South Fork, Chickamauga-Chattanooga, Cumberland Gap, Fort Donelson, Mammoth Cave, Natchez Trace, Shiloh); USFS (Daniel Boone, Jefferson?, Land Between the Lakes)

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** none.

**Local Description Authors:**

**Global Description Authors:** M. Pyne, mod. C.W. Nordman

**References:** Campbell 2001, Evans 1991, Franklin et al. 1993, Franklin pers. comm., Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

### Successional Black Walnut Forest

*Juglans nigra* / *Verbesina alternifolia* Forest

Black Walnut / Wingstem Forest

Identifier: CEGL007879

#### 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>Juglans nigra</i> Forest Alliance (A.1932)
Alliance (English name)	Black Walnut Forest Alliance
Association	<i>Juglans nigra</i> / <i>Verbesina alternifolia</i> Forest
Association (English name)	Black Walnut / Wingstem Forest
Association (Common name)	Successional Black Walnut Forest

**Ecological System(s):** South-Central Interior Large Floodplain (CES202.705)  
Southern Interior Low Plateau Dry-Mesic Oak Forest (CES202.898)

#### ELEMENT CONCEPT

**Global Summary:** This is a potentially widespread association. This community was sampled on former homesites along streams, possibly in association with circumneutral soils, at 460-610 m (1500-2000 feet) elevation in the Smokies, as well as on ridgetops, slopes, and stream areas in the Cumberlands and Alleghenies at 460-1070 m (1500-3500 feet). In addition, the association was sampled from the Piedmont of South Carolina in low-lying, poor-drainage areas from approximately 170 to 200 m (550-650 feet) in elevation. The community was originally defined from former homesites in Great Smoky Mountains National Park, where this association is an open, successional forest. It has since been found on some old pasture sites, associated with former settlement, through its range.

*Juglans nigra* is often the sole canopy tree, though *Liriodendron tulipifera*, *Juglans cinerea*, *Robinia pseudoacacia*, *Morus rubra*, and *Aesculus flava* are codominants in some examples. Associates can also include *Platanus*

*occidentalis*, *Fraxinus americana*, and *Ulmus rubra*; *Sassafras albidum* may be present as a small tree. The herb stratum is dominated by *Verbesina alternifolia* and/or *Ageratina altissima*. Other herbs include *Amphicarpaea bracteata*, *Agrimonia pubescens*, *Galium triflorum*, *Osmorhiza longistylis*, *Viola striata*, and *Ambrosia trifida*. The exotics *Rosa multiflora* and *Microstegium vimineum* can be common in this community.

### ENVIRONMENTAL DESCRIPTION

#### USFWS Wetland System:

**Chickamauga-Chattanooga National Military Park Environment:** This forest association was found as a component of one stand occurring on a well-drained site on dolomites of the Knox Group at an elevation of about 214 m (700 feet). This site is suspected of being an old homestead or being used for grazing.

**Global Environment:** This community often occurs on former homesites along streams or on slopes, possibly in association with circumneutral soils. It was originally defined from former homesites in Great Smoky Mountains National Park, where this association is an open, successional forest.

### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** This association is a small-patch vegetation type strongly dominated by *Juglans nigra* with a moderately well-developed shrub layer, including *Symphoricarpos orbiculatus* and *Cercis canadensis*. The herbaceous layer is moderately well-developed and dominated by *Carex cherokeensis* and *Salvia urticifolia*.

**Global Vegetation:** *Juglans nigra* is often the sole canopy tree, though *Liriodendron tulipifera*, *Juglans cinerea*, *Celtis laevigata*, and *Aesculus flava* are dominant or codominant in some examples. Associates can also include *Platanus occidentalis*, *Fraxinus americana*, and *Ulmus rubra*; *Sassafras albidum* may be present as a small tree. The herb stratum is dominated by *Verbesina alternifolia* and/or *Verbesina alternifolia*. Other herbs include *Amphicarpaea bracteata*, *Agrimonia pubescens*, *Galium triflorum*, *Osmorhiza longistylis*, *Viola striata*, and *Ambrosia trifida*. The exotic *Rosa multiflora* can be common in this community.

### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Juglans nigra</i>

#### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Juglans nigra</i>
Herb (field)	Forb <i>Verbesina alternifolia</i>	

### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Cercis canadensis*, *Juglans nigra*, *Symphoricarpos orbiculatus*

**Global:** *Juglans nigra*, *Rosa multiflora*, *Verbesina alternifolia*

### OTHER NOTEWORTHY SPECIES

**Chickamauga-Chattanooga National Military Park:**

**Global:**

### CONSERVATION STATUS RANK

**Global Rank & Reasons:** GNA (ruderal) (2-Apr-2001). This vegetation represents vegetation created by anthropogenic disturbance and is thus not a conservation priority. Grank changed from GW to GD 2001-04-02 MP.

### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 3 - Weak

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** This association was originally described from Great Smoky Mountains National Park where this association can be distinguished with aerial photography.

**Global Similar Associations:****Global Related Concepts:**

Successional black walnut forest (Vanderhorst 2001a) =

**OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** During the Chickamauga-Chattanooga classification project, this association was only sampled from the Chickamauga Battlefield.

**Global Range:** This potentially widespread association is currently known from Tennessee and Kentucky east to the Carolinas and north to Virginia and West Virginia. It may range into adjacent states.

**Nations:** US

**States/Provinces:** GA, KY, NC, SC, TN, VA, WV

**USFS Ecoregions:** 221Hc:CCC, 221Ja:C??, 231Aa:PPP, 231Ae:PPP, M221Bb:CCC, M221Cc:CCC, M221Ce:CCC, M221Dd:CCC

**Federal Lands:** DOD (Camp Dawson); NPS (Big South Fork, Blue Ridge Parkway?, Chickamauga-Chattanooga, Cumberland Gap, Great Smoky Mountains, Kings Mountain, Mammoth Cave, Ninety Six)

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.07.

**Local Description Authors:** T. Govus

**Global Description Authors:** K.D. Patterson, mod. R. White and S.C. Gawler

**References:** NatureServe Ecology - Southeastern U.S. unpubl. data, Peet et al. unpubl. data 2002, Southeastern Ecology Working Group n.d., TDNH unpubl. data, Vanderhorst 2001a

**Interior Mid- to Late-Successional Sweetgum - Oak Forest**

*Liquidambar styraciflua* - *Quercus (alba, falcata)* Forest

Sweetgum - (White Oak, Southern Red Oak) Forest

Identifier: CEGL007217

**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>Liquidambar styraciflua</i> Forest Alliance (A.234)
Alliance (English name)	Sweetgum Forest Alliance
Association	<i>Liquidambar styraciflua</i> - <i>Quercus (alba, falcata)</i> Forest
Association (English name)	Sweetgum - (White Oak, Southern Red Oak) Forest
Association (Common name)	Interior Mid- to Late-Successional Sweetgum - Oak Forest

**Ecological System(s):** East Gulf Coastal Plain Northern Dry Upland Hardwood Forest (CES203.483)  
East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland  
(CES203.482)  
Southern Interior Low Plateau Dry-Mesic Oak Forest (CES202.898)  
Ozark-Ouachita Dry-Mesic Oak Forest (CES202.708)

#### ELEMENT CONCEPT

**Global Summary:** Stands of this successional forest association are dominated by *Liquidambar styraciflua* but also support additional species in the overstory such as *Quercus alba*, *Liriodendron tulipifera*, and/or *Quercus falcata*. This forest is somewhat later successional and/or more diverse than pure *Liquidambar styraciflua* forests [see *Liquidambar styraciflua* Forest (CEGL007216)]. This type may arise following disturbance of mixed *Quercus* - *Carya* forests. This vegetation type would be more prevalent or more likely to be encountered to the north of the range of *Quercus nigra*, i.e., in the interior and Piedmont rather than in the Coastal Plain.

#### ENVIRONMENTAL DESCRIPTION

##### USFWS Wetland System:

##### Chickamauga-Chattanooga National Military Park Environment:

**Global Environment:** This type may arise following disturbance of mixed *Quercus* - *Carya* forests. This vegetation type would be more prevalent or more likely to be encountered to the north of the range of *Quercus nigra*, i.e., in the interior and Piedmont rather than in the Coastal Plain.

#### VEGETATION DESCRIPTION

##### Chickamauga-Chattanooga National Military Park Vegetation:

**Global Vegetation:** The overstory of stands of this association are usually dominated by *Liquidambar styraciflua*, but may also support other species such as *Quercus alba*, *Liriodendron tulipifera*, and *Quercus falcata*. Other woody species encountered in plots attributed to this type include *Fraxinus americana*, *Cornus florida*, *Diospyros virginiana*, *Quercus velutina*, *Quercus rubra*, and *Carya* spp. (NatureServe Ecology unpubl. data).

At Shiloh National Military Park, this vegetation is documented from a plot (SHIL.4) which was disturbed by a tornado in 1971 or 1972 (D. Turnbo pers. comm. 2003). There are stumps and tip-up mounds from the tornado and the salvage logging which followed. The dominant tree is *Liquidambar styraciflua* with *Acer rubrum* canopy subdominant. *Carya alba* and *Quercus alba* are also important, with *Quercus falcata*, *Prunus serotina*, *Nyssa sylvatica*, and *Carya glabra*. *Cornus florida*, *Carya pallida*, and *Quercus rubra* are important primarily in the subcanopy and tall-shrub strata. *Vaccinium stamineum* and *Ilex decidua* are tall shrubs; most of the *Quercus* spp. and *Carya* spp. also occur as tall shrubs. Short shrubs include *Quercus phellos*, *Ulmus alata*, *Rosa carolina*, *Vitis rotundifolia*, *Lonicera japonica*, *Mimosa microphylla*, *Hypericum hypericoides*, *Juniperus virginiana*, *Ligustrum sinense*, *Vaccinium stamineum*, *Diospyros virginiana*, *Nyssa sylvatica*, *Smilax glauca*, *Carya glabra*, *Vaccinium arboreum*, and *Rubus argutus*. The herbaceous stratum has 30% cover, but there are no dominant species. The most abundant herbaceous species are *Dichanthelium boscii* and *Botrychium biternatum*. Other herbaceous species are *Scutellaria elliptica*, *Houstonia purpurea*, *Elephantopus tomentosus*, *Asplenium platyneuron*, *Polystichum acrostichoides*, *Dichanthelium laxiflorum*, *Viola X palmata*, *Galium circaezans*, *Sanicula canadensis*, *Athyrium filix-femina* ssp. *asplenioides*, *Conoclinium coelestinum*, *Lobelia puberula*, *Cirsium horridulum*, *Lycopodium digitatum* (= *Diphasiastrum digitatum*), *Chasmanthium laxum*, *Lespedeza repens*, *Ruellia strepens*, and *Pycnanthemum verticillatum* var. *pilosum* (= *Pycnanthemum pilosum*).

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:****OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:****Global:****CONSERVATION STATUS RANK**

**Global Rank & Reasons:** GNA (ruderal) (8-Aug-2000). This forest represents successional vegetation. Consequently it is not of conservation concern and does not receive a conservation status rank.

**CLASSIFICATION**

**Status:** Standard

**Classification Confidence:** 3 - Weak

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** This community is composed of at least 40% *Liquidambar styraciflua* in the canopy, but it differs from earlier successional *Liquidambar styraciflua* in that it has a minor or major component of oaks and hickories and other later-successional trees in the subcanopy and canopy. However, unlike less-disturbed, more natural *Liquidambar styraciflua* types, it is not located in a floodplain and it has a very low-diversity herbaceous layer.

**Global Similar Associations:**

*Liquidambar styraciflua* - *Carya illinoensis* - *Quercus nigra* Forest (CEGL004122)

*Liquidambar styraciflua* - *Quercus (nigra, phellos)* - *Pinus taeda* / *Vaccinium elliotii* - *Morella cerifera* Forest (CEGL007726)--which is more likely and more prevalent in the southern Coastal Plain.

*Liquidambar styraciflua* Forest (CEGL007216)--terms (prior to the appearance of oak saplings in the canopy and subcanopy).

**Global Related Concepts:****OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This association was observed, but no plot data were taken, in the vicinity of Lookout Mountain on lower slopes near Lookout Creek.

**Global Range:** This early-successional sweetgum forest has been defined from the Interior Highlands of the central United States and from the Piedmont of the southeastern United States, and is also reported for the Southern Ridge and Valley, but is likely much more widespread.

**Nations:** US

**States/Provinces:** AL?, AR, GA, MS, SC, TN

**USFS Ecoregions:** 222A:CC, 222Cg:CCC, 222Eg:CCC, 231Cc:CCC, M222A:CC, M231A:CC

**Federal Lands:** NPS (Buffalo River?, Chickamauga-Chattanooga, Fort Donelson, Natchez Trace, Shiloh); USFS (Delta?, Holly Springs, Oconee?, Ouachita, Ouachita (Mountains), Ozark, Talladega (Oakmulgee)?, Talladega (Talladega)?, Talladega?, Tombigbee?, Tuskegee?)

**ELEMENT SOURCES****Chickamauga-Chattanooga National Military Park Inventory Notes:****Chickamauga-Chattanooga National Military Park Plots:****Local Description Authors:**

**Global Description Authors:** R.E. Evans, mod. C.W. Nordman

**References:** Gallyoun et al. 1996, NatureServe Ecology - Southeastern U.S. unpubl. data, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, Turnbo pers. comm.

### **Successional Sweetgum Forest**

*Liquidambar styraciflua* Forest

Sweetgum Forest

Identifier: CEGL007216

### **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>Liquidambar styraciflua</i> Forest Alliance (A.234)
Alliance (English name)	Sweetgum Forest Alliance
Association	<i>Liquidambar styraciflua</i> Forest
Association (English name)	Sweetgum Forest
Association (Common name)	Successional Sweetgum Forest

### **Ecological System(s):**

#### **ELEMENT CONCEPT**

**Global Summary:** This early-successional upland forest results from succession following human activities, such as logging and clearing. Stands are dominated by *Liquidambar styraciflua*, sometimes to the exclusion of other species. A related, later-successional bottomland association is *Liquidambar styraciflua* - *Liriodendron tulipifera* / *Lindera benzoin* / *Arisaema triphyllum* ssp. *triphyllum* Forest (CEGL004418).

#### **ENVIRONMENTAL DESCRIPTION**

#### **USFWS Wetland System:**

#### **Chickamauga-Chattanooga National Military Park Environment:**

**Global Environment:** This association is found in uplands that have been heavily impacted by agriculture or other severe disturbances and are recovering.

#### **VEGETATION DESCRIPTION**

#### **Chickamauga-Chattanooga National Military Park Vegetation:**

**Global Vegetation:** Stands are dominated by *Liquidambar styraciflua*, sometimes to the exclusion of other species.

#### **MOST ABUNDANT SPECIES**

#### **Chickamauga-Chattanooga National Military Park**

<b><u>Stratum</u></b>	<b><u>Lifeform</u></b>	<b><u>Species</u></b>
<b>Global</b>		
<b><u>Stratum</u></b>	<b><u>Lifeform</u></b>	<b><u>Species</u></b>
Tree canopy	Broad-leaved deciduous tree	<i>Liquidambar styraciflua</i>
Shrub/sapling (tall & short)	Broad-leaved deciduous tree	<i>Liquidambar styraciflua</i>

#### **CHARACTERISTIC SPECIES**

#### **Chickamauga-Chattanooga National Military Park:**

**Global:**

**OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:****Global:****CONSERVATION STATUS RANK**

**Global Rank & Reasons:** GNA (modified/managed) (19-Aug-2002). This is an upland successional vegetation type composed of native species. Its conservation value is limited, but it may provide buffer for communities of greater conservation value.

**CLASSIFICATION**

**Status:** Standard

**Classification Confidence:** 3 - Weak

**Chickamauga-Chattanooga National Military Park Comments:****Global Comments:****Global Similar Associations:**

*Liquidambar styraciflua* - *Liriodendron tulipifera* / *Lindera benzoin* / *Arisaema triphyllum* ssp. *triphyllum* Forest (CEGL004418)--a later-successional bottomland association.

*Liquidambar styraciflua* - *Quercus (alba, falcata)* Forest (CEGL007217)--of interior provinces.

*Liquidambar styraciflua* - *Quercus (nigra, phellos)* - *Pinus taeda* / *Vaccinium elliotii* - *Morella cerifera* Forest (CEGL007726)--a more diverse successional forest of the Coastal Plain.

**Global Related Concepts:**

sweet gum successional forest (Collins and Anderson 1994) =

**OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION****Chickamauga-Chattanooga National Military Park Range:**

**Global Range:** This association may be found throughout the southeastern United States, in the coastal plains and interior ecoregions. It is also attributed to New Jersey with the merger of CEGL006927. The status in intervening states (e.g., Delaware, Maryland) needs to be assessed.

**Nations:** US

**States/Provinces:** AL, AR?, DE, GA, KY, LA, MD, MS, NC, NJ, OK, SC, TN, VA

**USFS Ecoregions:** 221Hc:CCC, 222Fa:CCP, 222Fb:CCC, 222Fe:CCP, 231Aa:CPP, 231Bh:CCC, 232Ac:CCC, M221Dc:???, M221Dd:???

**Federal Lands:** NPS (Big South Fork, Chickamauga-Chattanooga?, Cowpens, Guilford Courthouse, Kings Mountain, Mammoth Cave, Natchez Trace, Ninety Six, Shiloh, Thomas Stone, Vicksburg); USFS (Cherokee?, Oconee?, St. Francis?); USFWS (Great Swamp, Prime Hook)

**ELEMENT SOURCES****Chickamauga-Chattanooga National Military Park Inventory Notes:****Chickamauga-Chattanooga National Military Park Plots:****Local Description Authors:**

**Global Description Authors:** R. White, mod. M. Pyne

**References:** Collins and Anderson 1994, NatureServe Ecology - Southeastern U.S. unpubl. data, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

**Successional Tuliptree Bottomland Forest***Liriodendron tulipifera* - *Acer negundo* Forest

Tuliptree - Box-elder Forest

Identifier: CEGL007184

**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>Liriodendron tulipifera</i> Forest Alliance (A.236)
Alliance (English name)	Tuliptree Forest Alliance
Association	<i>Liriodendron tulipifera</i> - <i>Acer negundo</i> Forest
Association (English name)	Tuliptree - Box-elder Forest
Association (Common name)	Successional Tuliptree Bottomland Forest

**Ecological System(s):****ELEMENT CONCEPT**

**Global Summary:** This association includes successional wet to mesic forests occurring in bottoms and on low slopes of the Appalachians and Interior Low Plateau. This vegetation is probably extensive in the Ridge and Valley, Interior Low Plateau, and related provinces. Related vegetation is possible in the Chesapeake Bay region. These stands are apparently successional following intensive timber removal and also occur on old pastures. Examples are generally dominated by *Acer negundo* and *Liriodendron tulipifera*; however, the canopy composition is diverse and variable. In some examples, *Acer rubrum* may also contribute to the canopy cover. *Asimina triloba* is present in the subcanopy or shrub strata where it makes up 5-50% of the total cover. *Liriodendron tulipifera* may share dominance with *Acer rubrum* in the canopy of some examples. The exotic grass *Microstegium vimineum* often dominates the herbaceous layer.

**ENVIRONMENTAL DESCRIPTION****USFWS Wetland System:****Chickamauga-Chattanooga National Military Park Environment:**

**Global Environment:** These successional wet to mesic forests occur in bottoms and on low slopes of the Appalachians and Interior Low Plateau. These stands are apparently successional following intensive timber removal and also occur on old pastures. This forest occurs along intermittent streams draining into Tellico Lake and on slopes of intermittent to ephemeral draws on the higher reaches of these streams (Andreu and Tukman 1995). Species composition was found to vary between these two topographic situations. This type represents mesic forest succession on areas cleared prior to Tellico Lake creation in 1979. Possible environments for this semi-natural type include streambanks, flat bottoms, upland mountain benches below 915 m (3000 feet), middle to lower slopes, sheltered coves and gentle concave slopes, and river terraces over various soils and geologies. This element may actually represent a combination of temporarily flooded (stands with *Acer negundo*) and upland (stands with *Acer rubrum*) components.

**VEGETATION DESCRIPTION****Chickamauga-Chattanooga National Military Park Vegetation:**

**Global Vegetation:** Examples of this community have diverse and variable canopies, generally dominated by *Acer negundo* and *Liriodendron tulipifera* (Andreu and Tukman 1995). In some examples, *Acer rubrum* may also contribute to the canopy cover. *Asimina triloba* is present in the subcanopy or shrub strata where it makes up 5-50% of the total cover. *Liriodendron tulipifera* may share dominance with *Acer rubrum* in the canopy of some examples. The exotic grass *Microstegium vimineum* often dominates the herbaceous layer.

**MOST ABUNDANT SPECIES****Chickamauga-Chattanooga National Military Park**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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<u>Global Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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**CHARACTERISTIC SPECIES****Chickamauga-Chattanooga National Military Park:****Global:****OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:****Global:****CONSERVATION STATUS RANK**

**Global Rank & Reasons:** G4G5 (19-Apr-2001). This is a successional forest composed of species native to North America. It is not a rare forest type, and should be secure. Rank was changed from GW 2001-04-19 MP.

**CLASSIFICATION****Status:** Standard**Classification Confidence:** 3 - Weak**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** This element may actually represent a combination of temporarily flooded (stands with *Acer negundo*) and upland (stands with *Acer rubrum*) components. Described from Tellico Pilot Project (Ridge and Valley of northeastern Monroe County, Tennessee; 31 stands sampled), where this forest occurs along intermittent streams draining into Tellico Lake and on slopes of intermittent to ephemeral draws on the higher reaches of these streams (Andreu and Tukman 1995). Species composition was found to vary between these two topographic situations. This type represents mesic forest succession on areas cleared prior to Tellico Lake creation in 1979.

**Global Similar Associations:***Liriodendron tulipifera* - *Pinus taeda* Forest (CEGL007521)*Liriodendron tulipifera* - *Quercus* spp. Forest (CEGL007221)**Global Related Concepts:****OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION****Chickamauga-Chattanooga National Military Park Range:**

**Global Range:** This type is found in the Appalachians and Interior Low Plateau from Maryland and Pennsylvania west and south to Kentucky and Tennessee.

**Nations:** US**States/Provinces:** KY?, MD, PA, TN, VA, WV

**USFS Ecoregions:** 221Hc:C??, 221He:C??, 221Jb:CCC, 222Eb:CCC, 222Ed:CCP, M221Aa:CCC, M221Ac:CCC, M221Ad:CCC, M221Bb:CCC, M221D:C?

**Federal Lands:** NPS (Chickamauga-Chattanooga?, Harpers Ferry, Obed?); TVA (Tellico); USFS (Cherokee?)

**ELEMENT SOURCES****Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:****Local Description Authors:****Global Description Authors:** R.E. Evans**References:** Andreu and Tukman 1995, Fike 1999, Harrison 2004, Southeastern Ecology Working Group n.d., TDNH unpubl. data, Vanderhorst 2000b**Interior Mid- to Late-Successional Tuliptree - Hardwood Upland Forest (Acidic Type)***Liriodendron tulipifera* - *Quercus* spp. Forest

Tuliptree - Oak species Forest

Identifier: CEGL007221

**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>Liriodendron tulipifera</i> Forest Alliance (A.236)
Alliance (English name)	Tuliptree Forest Alliance
Association	<i>Liriodendron tulipifera</i> - <i>Quercus</i> spp. Forest
Association (English name)	Tuliptree - Oak species Forest
Association (Common name)	Interior Mid- to Late-Successional Tuliptree - Hardwood Upland Forest (Acidic Type)

**Ecological System(s):** Southern Coastal Plain Mesic Slope Forest (CES203.476)  
 Southern Interior Low Plateau Dry-Mesic Oak Forest (CES202.898)  
 East Gulf Coastal Plain Northern Dry Upland Hardwood Forest (CES203.483)

**ELEMENT CONCEPT**

**Global Summary:** This broadly defined semi-natural or successional community is one of several described upland associations dominated by *Liriodendron tulipifera*. It ranges from the southern Cumberland Plateau, Piedmont, and Interior Low Plateau of the southeastern U.S. north to the northern Piedmont of New Jersey. Species found in stands attributable to this type may include a fairly diverse and varied composition. *Acer rubrum*, *Quercus* spp., and occasionally *Liquidambar styraciflua* or *Robinia pseudoacacia* may be common in stands of this type; *Betula lenta* often occurs at the northern end of the range. Examples are common across large areas of the upland landscape which have previously been disturbed. These successional forests often follow cropping, clearcut logging, or other severe disturbance, and are successional to mixed *Quercus* - *Carya* forests. The oaks in these stands are frequently multi-stemmed, resulting from coppicing. Shrub composition is variable but may include *Sambucus canadensis* and *Vaccinium pallidum*. Herbs are likewise variable; West Virginia samples feature *Dioscorea quaternata*, *Lysimachia quadrifolia*, *Maianthemum racemosum*, *Solidago curtisii*, *Symphyotrichum prenanthoides*, and *Geranium maculatum*. This association differs from other described types in the alliance based on the lack of a significant pine component [see *Liriodendron tulipifera* - *Pinus taeda* Forest (CEGL007521)] and the absence of species affiliated with circumneutral conditions [see *Liriodendron tulipifera* / (*Cercis canadensis*) / (*Lindera benzoin*) Forest (CEGL007220)]; it is later successional and more diverse than *Liriodendron tulipifera* Forest (CEGL007218) or *Liriodendron tulipifera* - *Robinia pseudoacacia* Forest (CEGL007219).

**ENVIRONMENTAL DESCRIPTION****USFWS Wetland System:****Chickamauga-Chattanooga National Military Park Environment:**

**Global Environment:** These semi-natural upland deciduous forests are found primarily in areas which were once clearcuts, old fields, or were cleared by fire or other natural disturbances. These non-wetland forests are also found along mesic stream terraces. In previously logged areas on West Virginia plateaus which span a topographic

gradient, this association occurs in water-collecting positions (lower slopes, coves), while water-shedding positions (upper slopes, ridges) are occupied by oak-dominated forests.

#### VEGETATION DESCRIPTION

##### Chickamauga-Chattanooga National Military Park Vegetation:

**Global Vegetation:** The canopy of this semi-natural upland association is dominated by *Liriodendron tulipifera*. *Quercus* species (*Quercus alba*, *Quercus rubra*, *Quercus falcata*, *Quercus nigra*, *Quercus velutina*) are often present; additional associates may include *Acer rubrum*, *Carya* spp., *Fagus grandifolia*, *Nyssa sylvatica*, *Cornus florida*, and *Robinia pseudoacacia*. *Betula lenta* is a common associate at the northern range limit. Shrub layers may include saplings of the canopy species and *Acer pensylvanicum*, *Amelanchier arborea*, *Hamamelis virginiana*, *Lindera benzoin* (in small amounts), and *Vaccinium pallidum*. Herbs vary across the range but may include *Actaea racemosa*, *Dichanthelium clandestinum*, *Dioscorea quaternata*, *Galium circaezans*, *Geranium maculatum*, *Goodyera pubescens*, *Medeola virginiana*, *Potentilla simplex*, *Scutellaria serrata*, *Thelypteris noveboracensis*, and *Uvularia perfoliata*. *Lycopodium digitatum* may be abundant in some stands.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
<b>Global</b>		
<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree (canopy & subcanopy)	Broad-leaved deciduous tree	<i>Liriodendron tulipifera</i>
Tall shrub/sapling	Broad-leaved deciduous shrub	<i>Cornus florida</i>
Herb (field)	Fern or fern ally	<i>Lycopodium digitatum</i>

#### CHARACTERISTIC SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:** *Acer pensylvanicum*, *Acer rubrum*, *Actaea racemosa*, *Amelanchier arborea*, *Carya glabra*, *Dichanthelium clandestinum*, *Fagus grandifolia*, *Galium circaezans*, *Geranium maculatum*, *Goodyera pubescens*, *Hamamelis virginiana*, *Lycopodium digitatum*, *Medeola virginiana*, *Nyssa sylvatica*, *Quercus rubra*, *Quercus velutina*, *Robinia pseudoacacia*, *Thelypteris noveboracensis*, *Uvularia perfoliata*, *Vaccinium pallidum*

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:**

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** GNA (ruderal) (19-Aug-2002). This forest represents early-successional vegetation and is thus not of conservation concern. This is a successional vegetation type composed of native species. Its conservation value is limited, but mature examples could provide buffer for communities of greater conservation value.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

##### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** Within its range, it differs from other described types based on the lack of a significant pine component [see *Liriodendron tulipifera* - *Pinus taeda* Forest (CEGL007521)] and the absence of species affiliated with circumneutral conditions [see *Liriodendron tulipifera* / (*Cercis canadensis*) / (*Lindera benzoin*) Forest (CEGL007220)]; it is later successional and more diverse than *Liriodendron tulipifera* Forest (CEGL007218) and tends to be found on more stable soil substrates and less steep slopes than *Liriodendron tulipifera* - *Robinia pseudoacacia* Forest (CEGL007219).

**Global Similar Associations:**

*Liriodendron tulipifera* - *Acer negundo* Forest (CEGL007184)--a bottomland type.

*Liriodendron tulipifera* - *Robinia pseudoacacia* Forest (CEGL007219)--is generally found on steeper slopes and/or shallow soils and with a more intense history of disturbance.

*Liriodendron tulipifera* / (*Cercis canadensis*) / (*Lindera benzoin*) Forest (CEGL007220)--is generally found on calcareous or at least pH neutral soils.

*Prunus serotina* - *Liriodendron tulipifera* - *Acer rubrum* - *Fraxinus americana* Forest (CEGL006599)

*Prunus serotina* - *Sassafras albidum* - (*Fraxinus americana*) / *Juniperus virginiana* Forest (CEGL004133)

**Global Related Concepts:**

Successional forest of low-elevation plateaus (Vanderhorst 2001a) B

Tulip Poplar Type (Schmalzer and DeSelm 1982) B

Yellow poplar community (Ehrenfeld 1977) =

**OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION****Chickamauga-Chattanooga National Military Park Range:**

**Global Range:** This association is known from the southern Cumberland Plateau, Piedmont, and Interior Low Plateau of the southeastern U.S. and may also occur in the Upper East Gulf Coastal Plain. It ranges north to the northern Piedmont of New Jersey and adjacent Pennsylvania. It is also known from Alabama, Georgia, Kentucky, Maryland, North Carolina, South Carolina, Tennessee, West Virginia, and possibly Virginia and Delaware.

**Nations:** US

**States/Provinces:** AL, DE?, GA, KY, MD, NC, NJ, PA, SC, TN, VA?, WV

**USFS Ecoregions:** 221Hc:CCC, 221He:CCC, 222Cg:CCC, 222D:CC, 222Eb:CCC, 222En:CCC, 222Eo:CCC, 231Aa:CCP, 231Ae:CCC, 231Bc:CCC, 231Bh:CCC, 231Cd:CCP, 231Dc:CCC, M221Bb:CCC, M221Cb:CCC

**Federal Lands:** DOD (Camp Dawson, Fort Benning); NPS (Big South Fork, Blue Ridge Parkway, Chickamauga-Chattanooga?, Cowpens, Cumberland Gap, Guilford Courthouse, Kennesaw Mountain, Kings Mountain, Mammoth Cave, Morristown, Natchez Trace, New River Gorge, Ninety Six, Obed, Shiloh, Valley Forge); USFS (Bankhead, Daniel Boone, Oconee?, Talladega, Talladega (Oakmulgee)?, Talladega (Talladega))

**ELEMENT SOURCES****Chickamauga-Chattanooga National Military Park Inventory Notes:****Chickamauga-Chattanooga National Military Park Plots:****Local Description Authors:**

**Global Description Authors:** R.E. Evans and M. Pyne, mod. L.A. Sneddon, R. White, S.C. Gawler

**References:** Ehrenfeld 1977, Gallyoun et al. 1996, Keever 1973, NatureServe Ecology - Southeastern U.S. unpubl. data, Overlease 1987, Russell and Schuyler 1988, Schmalzer and DeSelm 1982, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, Vanderhorst 2001a, Vanderhorst and Streets 2006

**Successional Tuliptree Forest (Circumneutral Type)**

*Liriodendron tulipifera* / (*Cercis canadensis*) / (*Lindera benzoin*) Forest

Tuliptree / (Eastern Redbud) / (Northern Spicebush) Forest

Identifier: CEGL007220

**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>Liriodendron tulipifera</i> Forest Alliance (A.236)
Alliance (English name)	Tuliptree Forest Alliance
Association	<i>Liriodendron tulipifera</i> / ( <i>Cercis canadensis</i> ) / ( <i>Lindera benzoin</i> ) Forest
Association (English name)	Tuliptree / (Eastern Redbud) / (Northern Spicebush) Forest
Association (Common name)	Successional Tuliptree Forest (Circumneutral Type)
<b>Ecological System(s):</b>	Appalachian (Hemlock)-Northern Hardwood Forest (CES202.593) Southern Interior Low Plateau Dry-Mesic Oak Forest (CES202.898)

### ELEMENT CONCEPT

**Global Summary:** This semi-natural or successional community dominated by *Liriodendron tulipifera* occurs in the Ridge and Valley of Tennessee and Virginia, and the Central Appalachians, Piedmont and inner Coastal Plain regions of Virginia, West Virginia, and Maryland. It may also occur in similar regions of Pennsylvania, Kentucky and Delaware. It is distinguished from other upland communities dominated by *Liriodendron tulipifera* by the presence of species associated with soils with moderately high base saturation levels (rich soils). Species found in stands attributable to this type may be fairly diverse and result in a varied composition. In addition to *Liriodendron tulipifera*, other canopy species may include *Liquidambar styraciflua*, *Acer saccharum*, *Robinia pseudoacacia*, *Juglans nigra*, *Fraxinus americana*, *Aesculus flava*, *Magnolia acuminata*, *Ulmus rubra*, *Quercus imbricaria*, *Quercus muehlenbergii*, *Prunus serotina*, and *Carya ovata*. Species often found in the subcanopy include *Acer saccharum*, *Cercis canadensis*, *Ulmus alata*, *Fraxinus americana*, *Morus rubra*, and *Cornus florida*. Shrubs include saplings of the subcanopy and canopy species, as well as *Lindera benzoin*, *Symphoricarpos orbiculatus*, *Asimina triloba*, *Staphylea trifolia*, *Acer negundo*, and *Juniperus virginiana* var. *virginiana*. Exotic shrubs, including *Rosa multiflora*, *Rubus phoenicolasius*, and *Lonicera japonica*, are present at some sites. Herbaceous species include the exotics *Microstegium vimineum*, *Alliaria petiolata*, and *Veronica hederifolia*, as well as *Toxicodendron radicans*, *Parthenocissus quinquefolia*, *Actaea racemosa*, *Caulophyllum thalictroides*, *Laportea canadensis*, *Impatiens pallida*, *Hydrophyllum canadense*, *Adiantum pedatum*, *Polygonatum pubescens*, *Verbesina alternifolia*, *Amphicarpaea bracteata*, and *Polystichum acrostichoides*.

### ENVIRONMENTAL DESCRIPTION

#### USFWS Wetland System:

**Chickamauga-Chattanooga National Military Park Environment:** The example studied occurs on nutrient-rich, mesic soils within the urban environment of Sherman Reservation. This highly disturbed environment includes an abundance of non-native species. The site is located on a ridgetop near the summit of Missionary Ridge at an elevation of about 305 m (1000 feet).

**Global Environment:** These forests are found on disturbed mesic areas underlain by rich soils with moderately high base saturation levels. It occurs on abandoned farmland and townsites, old strip mines, old clearcuts, burned areas, and other areas where the canopy was removed or heavily disturbed in the past. Small patches may occur in areas where canopy disturbance has resulted from natural causes such as windfall or landslides. Soils may be underlain by a variety of geologic strata that weather to base-rich soils including limestone, dolomite, calcareous shale, shell deposits, metabasalts and granitic complexes. In Kentucky this association may occur on calcareous substrates in the Dripping Springs Escarpment. At Shenandoah National Park in Virginia, this community is underlain by Catoclin metabasalt or a pyroxene-bearing granitic complex. In West Virginia, parent materials include sandstone, shale, and alluvium. Soils in plots were described as moderately well-drained to well-drained clay, silt loam, and sandy loam with pH ranging from 5.0 to 7.5.

### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** The example documented by this study is atypical in that few of the nominal species are present in the canopy layer. The overall composition, however, is indicative of a successional forest occurring on high base substrates. The canopy was dominated by *Prunus serotina* and *Quercus phellos* with an understory of *Morus rubra*. The shrub layer is strongly dominated by the exotic shrub *Lonicera maackii*. Other shrubs include *Ligustrum sinense*, *Ulmus alata*, *Frangula caroliniana*, and *Cercis canadensis*. The ground cover is made up of equal amounts of *Lonicera japonica* and *Toxicodendron radicans*.

**Global Vegetation:** Stands are dominated by *Liriodendron tulipifera* but also include various other species, including ones indicative of rich or circumneutral environments. Other species include *Liquidambar styraciflua*, *Acer saccharum*, *Aesculus flava*, *Robinia pseudoacacia*, *Juglans nigra*, *Halesia tetraptera*, *Fraxinus americana*, *Magnolia acuminata*, *Ulmus rubra*, *Quercus imbricaria*, *Quercus muehlenbergii*, and *Carya ovata* (NatureServe Ecology unpubl. data, VDNH unpubl. data). Species often found in the subcanopy include *Acer saccharum*, *Cercis canadensis*, *Ulmus alata*, *Morus rubra*, *Sassafras albidum*, and *Cornus florida*. *Cercis canadensis* is often abundant on soils underlain by carbonate strata. Shrubs include saplings of the subcanopy and canopy species, as well as *Symphoricarpos orbiculatus*, *Lindera benzoin*, *Asimina triloba*, and *Juniperus virginiana* var. *virginiana*. *Lindera benzoin* is often abundant in occurrences of this community in the Central Appalachians, Piedmont and inner Coastal Plain regions of Virginia, West Virginia, and Maryland. Exotic shrubs, including *Rosa multiflora*, *Rubus phoenicolasius*, and *Lonicera japonica*, are present at some sites. Vines, which may be abundant, include *Aristolochia macrophylla*, *Toxicodendron radicans*, and *Vitis aestivalis* var. *bicolor*. Herbaceous species include the exotics *Microstegium vimineum*, *Alliaria petiolata*, and *Veronica hederifolia*, as well as *Actaea racemosa*, *Ageratina altissima*, *Arisaema triphyllum*, *Asarum canadense*, *Caulophyllum thalictroides*, *Cryptotaenia canadensis*, *Galium triflorum*, *Laportea canadensis*, *Impatiens pallida*, *Hydrophyllum canadense*, *Osmorhiza longistylis*, *Adiantum pedatum*, *Polygonatum pubescens*, *Polystichum acrostichoides*, *Verbesina alternifolia*, *Amphicarpaea bracteata*, and *Polystichum acrostichoides*. (Andreu and Tukman 1995, NatureServe Ecology unpubl. data, WVNHP unpubl. data, VDNH unpubl. data). Examples at Fort Donelson that have been very heavily disturbed may have local dominance by *Celtis laevigata* and *Juglans nigra*.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Prunus serotina</i>
Shrub/sapling (tall & short)	Vine/Liana	<i>Lonicera maackii</i>
Tall shrub/sapling	Broad-leaved deciduous shrub	<i>Lonicera japonica</i>

##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree (canopy & subcanopy)	Broad-leaved deciduous tree	<i>Liriodendron tulipifera</i>

#### CHARACTERISTIC SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:** *Acer saccharum*, *Aesculus flava*, *Ageratina altissima*, *Arisaema triphyllum*, *Aristolochia macrophylla*, *Asarum canadense*, *Asimina triloba*, *Carya ovata*, *Cercis canadensis*, *Cryptotaenia canadensis*, *Galium triflorum*, *Lindera benzoin*, *Osmorhiza longistylis*, *Parthenocissus quinquefolia*, *Polystichum acrostichoides*, *Toxicodendron radicans*, *Ulmus rubra*

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:**

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** GNA (ruderal) (28-Oct-2003). This forest represents early-successional vegetation and is thus not of conservation concern. It is composed largely of native species, though exotics may be locally abundant. Its conservation value is limited, but mature examples could provide buffer for communities of greater conservation value.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 3 - Weak

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** This type was originally described from the work of Andreu and Tukman (1995) but was later modified to emphasize stands with moderately high base saturation levels. It is apparently a widespread successional forest of relatively fertile substrates in all provinces of the Mid-Atlantic states and in parts of the Southeast.

**Global Similar Associations:**

*Liriodendron tulipifera* - *Pinus taeda* Forest (CEGL007521)--supports a significant pine component.

*Liriodendron tulipifera* - *Quercus* spp. Forest (CEGL007221)--lacks species affiliated with circumneutral conditions.

*Liriodendron tulipifera* Forest (CEGL007218)--is less diverse and earlier successional.

**Global Related Concepts:**

*Liriodendron tulipifera* / *Lindera benzoin* Forest (Lea 2000) F

Oak-Hickory Association of the Western Shore District (Shreve et al. 1910) B

Successional forest of low-elevation plateaus (Vanderhorst 2001a) B

Tulip Poplar Type (Schmalzer and DeSelm 1982) B

**OTHER COMMENTS**

**Other Comments:**

**ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:**

**Global Range:** This type occurs in the Ridge and Valley and Cumberland Plateau of Tennessee, Upper East Gulf Coastal Plain of Mississippi, and the Central Appalachian, Piedmont and Inner Coastal Plain regions of Virginia, West Virginia, Maryland and possibly Pennsylvania, Kentucky and Delaware. Its full range is unknown.

**Nations:** US

**States/Provinces:** DC, DE?, KY, MD, MS, PA?, TN, VA, WV

**USFS Ecoregions:** 221Hc:CCC, 221He:CCC, 221Jb:CCC, 222Eg:CCC, 231Ae:CCC, 231Al:CCC, 231Ap:CCC, 232Ad:CCC, M221Ab:CCC, M221Bb:CCC, M221Cb:CCC, M221Da:CCC

**Federal Lands:** DOD (Camp Dawson); NPS (Antietam, Big South Fork, Blue Ridge Parkway, C&O Canal, Catocin Mountain, Chickamauga-Chattanooga, Cumberland Gap, Fort Donelson, George Washington Parkway, Harpers Ferry, Lincoln Birthplace, Mammoth Cave, Natchez Trace, National Capital-East, New River Gorge, Obed, Rock Creek, Shenandoah, Thomas Stone, Vicksburg); TVA (Tellico); USFS (Cherokee?)

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.39.

**Local Description Authors:** T. Govus

**Global Description Authors:** R.E. Evans, mod. M. Pyne, J. Teague, C.W. Nordman, R. White, S.C. Gawler

**References:** Andreu and Tukman 1995, Hall and Mathews 1974, Lea 2000, Lea 2003, Martin 1989, NatureServe Ecology - Southeastern U.S. unpubl. data, Schmalzer and DeSelm 1982, Shreve et al. 1910, Southeastern Ecology Working Group n.d., TDNH unpubl. data, VDNH unpubl. data, Vanderhorst 2001a, Vanderhorst and Streets 2006, WVNHP unpubl. data b

**Cumberland Plateau Dry-Mesic White Oak Forest**

*Quercus alba* - (*Quercus prinus*) / (*Hydrangea quercifolia*) - *Viburnum acerifolium* / *Carex picta* - *Piptochaetium avenaceum* Forest

White Oak - (Chestnut Oak) / (Oakleaf Hydrangea) - Mapleleaf Viburnum / Painted Sedge - Eastern

Speargrass Forest

Identifier: CEGL008430

**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 prinus</i> ) / ( <i>Hydrangea quercifolia</i> ) - <i>Viburnum acerifolium</i> / <i>Carex picta</i> -
	<i>Piptochaetium avenaceum</i> Forest
Association (English name)	White Oak - (Chestnut Oak) / (Oakleaf Hydrangea) - Mapleleaf Viburnum /
Painted Sedge -	Speargrass Forest
Association (Common name)	Cumberland Plateau Dry-Mesic White Oak Forest
<b>Ecological System(s):</b>	Allegheny-Cumberland Dry Oak Forest and Woodland (CES202.359)

**ELEMENT CONCEPT**

**Global Summary:** This association includes dry-mesic white oak forests of the southern Cumberland Plateau in Alabama and Tennessee. This forest occurs mostly over sandstone-derived soils, on middle to high slopes and ridges; also included are areas influenced by calcareous rocks or soils. Diagnostic features of this association are canopy dominance by *Quercus alba*, with an overall dry-mesic species composition, signified by the prominence of *Quercus prinus*, *Vaccinium* spp., *Oxydendrum arboreum*, *Cornus florida*, and by the absence or low coverage of mesophytic forest species (e.g., *Fagus grandifolia*, *Tilia americana* var. *heterophylla*, *Ilex opaca* var. *opaca*, *Liriodendron tulipifera*, *Magnolia acuminata*, *Euonymus americanus*). In the Bankhead National Forest of Alabama, where the type was initially identified, the high constancy of *Magnolia macrophylla*, *Hydrangea quercifolia*, and *Carex picta* serve to help identify this type, but these taxa are not necessarily good indicators throughout its range. Additionally, *Pinus taeda* and/or *Pinus virginiana* (especially on higher slopes) may also be present but may indicate past disturbance. The most common subcanopy species are *Cornus florida*, *Oxydendrum arboreum*, and *Magnolia macrophylla* (within its range). On higher slopes and ridges *Nyssa sylvatica* and *Carya glabra* become additional, important subcanopy components. In areas with a calcareous influence, *Ostrya virginiana* may be dominant in the subcanopy. The shrub strata vary in density from site to site, but the constant shrub species are *Hydrangea quercifolia* and *Viburnum acerifolium*. On high slopes and ridges, *Vaccinium arboreum*, *Vaccinium stamineum*, and *Vaccinium pallidum* become shrub components, sometimes dominating the shrub layers. The herbaceous stratum can be sparse but often has patches of local dominance by *Carex picta* (within its range), especially on lower to middle slopes. *Piptochaetium avenaceum* and *Vitis rotundifolia* are characteristic of occurrences on high slopes and ridges. Additional herbs with high constancy are *Polystichum acrostichoides* and *Chimaphila maculata*, although other species may be present in more mesic examples of this forest.

**ENVIRONMENTAL DESCRIPTION****USFWS Wetland System:**

**Chickamauga-Chattanooga National Military Park Environment:** This association occurs on midslopes of Lookout Mountain over a mixture of dolomitic limestone and sandstone. The slope aspect is northwest and regarded as dry-mesic to slightly mesic. Elevations are in the range of 366 to 427 m (1200-1400 feet). The geologic substrates consists of a mixture of limestone, shale and sandstone.

**Global Environment:** This forest can occur on all slope positions but is mostly found on middle to high slopes and ridges. Examples are typically supported by sandstone-derived soils, although some examples may have a calcareous influence (NatureServe Ecology unpubl. data).

**VEGETATION DESCRIPTION**

**Chickamauga-Chattanooga National Military Park Vegetation:** The canopy includes a mixture of *Quercus alba* and *Quercus prinus* with lesser amounts of *Quercus velutina*. The subcanopy and understory include *Oxydendrum arboreum*, *Nyssa sylvatica*, *Prunus serotina*, *Acer rubrum*, *Cornus florida*, and *Carya glabra*. Occurrences here lack the *Magnolia macrophylla* found in Alabama examples. The shrub layer is sparse to moderately developed with *Viburnum acerifolium*, *Sassafras albidum* and *Calycanthus floridus*. The herbaceous layer is moderately well-

developed and more diverse than examples of this type in other geographic areas. A sparse cover of *Actaea racemosa* (= *Cimicifuga racemosa*), *Collinsonia canadensis*, *Phryma leptostachya*, *Maianthemum racemosum*, and *Geranium maculatum* typify the examples at Lookout Mountain. Vine species are also prominent and include *Parthenocissus quinquefolia*, *Berchemia scandens*, and *Vitis rotundifolia*.

**Global Vegetation:** This is a closed-canopy, deciduous forest with sparse, open to patchy shrub strata, and a variable herbaceous stratum. The canopy is always dominated by *Quercus alba*, with *Quercus prinus* usually codominating or occurring as a prominent canopy tree. *Quercus stellata* may be present in some examples. *Pinus taeda* or, on higher slopes, *Pinus virginiana* may blend in from adjacent forests or occur as an artifact of past disturbance. The most common subcanopy species are *Cornus florida*, *Oxydendrum arboreum*, and *Magnolia macrophylla* (within its range). On higher slopes and ridges *Nyssa sylvatica* and *Carya glabra* become additional, important subcanopy components. In areas with a calcareous influence, *Ostrya virginiana* may be dominant in the subcanopy. Other minor canopy and subcanopy trees may include *Acer leucoderme*, *Acer rubrum*, *Amelanchier arborea*, *Fagus grandifolia*, *Prunus serotina*, *Quercus coccinea*, and *Quercus falcata*. The shrub strata vary in density from site to site, but the constant shrub species are *Hydrangea quercifolia* (in Alabama) and *Viburnum acerifolium*. On high slopes and ridges, *Vaccinium arboreum*, *Vaccinium stamineum*, and *Vaccinium pallidum* become shrub components, sometimes dominating the shrub layers. On more mesic sites, *Acer leucoderme*, *Acer rubrum*, and *Amelanchier arborea* are shrubs. The herbaceous stratum can be sparse but often has patches of local dominance by *Carex picta* (within its range), especially on lower to middle slopes. *Piptochaetium avenaceum* and *Vitis rotundifolia* are characteristic of occurrences on high slopes and ridges. Additional herbs with high constancy are *Polystichum acrostichoides* and *Chimaphila maculata*, although other species may be present in more mesic and calcareous examples of this forest. Sparse coverage by species such as *Actaea racemosa* (= *Cimicifuga racemosa*), *Collinsonia canadensis*, *Phryma leptostachya*, *Maianthemum racemosum*, and *Geranium maculatum* are possible in such examples.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus alba</i>

<u>Global Stratum</u>	<u>Lifeform</u>	<u>Species</u>

#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Actaea racemosa*, *Calycanthus floridus*, *Cornus florida*, *Oxydendrum arboreum*, *Quercus alba*, *Quercus velutina*, *Viburnum acerifolium*

**Global:**

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:** *Scutellaria montana*

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G3G4 (5-Jan-2001). This is a hardwood forest found on slopes and ridges in the Cumberland Plateau in Tennessee and Alabama and possibly other states; it is not an inherently rare forest type. It is at least moderately widespread, and it is presumed to be relatively common throughout its range, although its full range is not known. It is not restricted to any highly specific geologic substrates. It is poorly documented through EOs, and not much data are available on the specific condition of examples of this type. Some examples are present on the Obed River, Big South Fork and Bankhead National Forest of Alabama, and these could receive some protection. Some stands have been impacted by removal of more valuable timber species (e.g., *Quercus alba*) and loss of herbaceous species diversity from the disturbance effects of logging. In all probability, most examples which are not on public land have been repeatedly logged and their composition altered thereby. Remaining unprotected examples are threatened by timber removal, conversion to other managed forest types, and/or development into residential or commercial real estate.

## CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** Examples of this association in more protected situations begin to resemble *Quercus alba* - *Fagus grandifolia* / *Hydrangea quercifolia* - *Viburnum acerifolium* / *Carex picta* - *Polystichum acrostichoides* Forest (CEGL007213). Overall this association (CEGL008430) is different from CEGL007213 and *Quercus alba* - (*Liriodendron tulipifera*, *Liquidambar styraciflua*) / *Calycanthus floridus* / *Athyrium filix-femina* Forest (CEGL008428) because it is on drier habitats and because of the absence or low coverage of mesophytic forest species (e.g., *Fagus grandifolia*, *Tilia americana* var. *heterophylla*, *Ilex opaca* var. *opaca*, *Liriodendron tulipifera*, *Magnolia acuminata*, *Euonymus americanus*). A very similar association defined from the Interior Low Plateau of Tennessee is *Quercus alba* - *Carya alba* - (*Quercus velutina*) / *Desmodium nudiflorum* - (*Carex picta*) Forest (CEGL007795), but differs by its lack of *Quercus prinus* and many of the character species (e.g., *Magnolia macrophylla*, *Hydrangea quercifolia*) found in this type (CEGL008430).

### Global Similar Associations:

*Quercus alba* - *Carya alba* - (*Quercus velutina*) / *Desmodium nudiflorum* - (*Carex picta*) Forest (CEGL007795)  
*Quercus alba* - *Fagus grandifolia* / *Hydrangea quercifolia* - *Viburnum acerifolium* / *Carex picta* - *Polystichum acrostichoides* Forest (CEGL007213)

*Quercus prinus* - *Quercus* (*alba*, *coccinea*, *velutina*) / *Viburnum acerifolium* - (*Kalmia latifolia*) Forest (CEGL005023)

### Global Related Concepts:

Chestnut Oak - White Oak Type (Schmalzer and DeSelm 1982) =

## OTHER COMMENTS

### Other Comments:

## ELEMENT DISTRIBUTION

**Chickamauga-Chattanooga National Military Park Range:** This association is confined to midslopes and slightly more protected areas on Lookout Mountain.

**Global Range:** This community occurs in the southern Cumberland Plateau of the southeastern United States. It is currently defined as occurring in Alabama and Tennessee, but it may extend into adjacent states (in particular Kentucky).

**Nations:** US

**States/Provinces:** AL, TN

**USFS Ecoregions:** 221Hc:CCC, 221He:CCC, 231Ca:CCC, 231Cd:CCC

**Federal Lands:** NPS (Big South Fork, Chickamauga-Chattanooga, Little River Canyon?, Obed); USFS (Bankhead)

## ELEMENT SOURCES

### Chickamauga-Chattanooga National Military Park Inventory Notes:

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.25, CHCH.26, CHCH.31, CHCH.33, CHCH.37.

**Local Description Authors:** T. Govus

**Global Description Authors:** K.D. Patterson, mod. C.W. Nordman and M. Pyne

**References:** NatureServe Ecology - Southeastern U.S. unpubl. data, Schmalzer and DeSelm 1982, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

**Rich Low-Elevation Appalachian Oak Forest***Quercus alba* - (*Quercus rubra*, *Acer saccharum*, *Fagus grandifolia*) / *Aesculus flava* Forest

White Oak - (Northern Red Oak, Sugar Maple, American Beech) / Yellow Buckeye Forest

Identifier: CEGL007233

**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>Acer saccharum</i> , <i>Fagus grandifolia</i> ) / <i>Aesculus flava</i> Forest
Association (English name)	White Oak - (Northern Red Oak, Sugar Maple, American Beech) / Yellow Buckeye Forest
Association (Common name)	Rich Low-Elevation Appalachian Oak Forest

**Ecological System(s):** South-Central Interior Mesophytic Forest (CES202.887)  
Southern and Central Appalachian Cove Forest (CES202.373)

**ELEMENT CONCEPT**

**Global Summary:** This mesic upland forest of the Ridge and Valley and adjacent Southern Blue Ridge is dominated by *Quercus alba*, *Carya ovata*, and *Carya alba*. *Quercus rubra* may be a dominant component of the canopy as well. Other species that may be present in the canopy are *Acer saccharum*, *Liriodendron tulipifera*, *Quercus velutina*, *Carya glabra*, *Fraxinus americana*, *Fagus grandifolia*, *Prunus serotina*, *Ulmus rubra*, and *Juglans nigra*. *Acer saccharum* may strongly dominate the subcanopy, this perhaps being a result of fire suppression. Other common subcanopy species include *Fraxinus americana*, *Ostrya virginiana*, *Asimina triloba*, *Fagus grandifolia*, *Oxydendrum arboreum*, and *Ulmus alata*. In the Ridge and Valley, examples may infrequently contain *Pinus virginiana*, *Quercus prinus*, *Aesculus flava*, *Tilia americana* var. *heterophylla*, *Pinus echinata*, *Pinus strobus*, and *Tsuga canadensis*. Shrubs of various heights are commonly present; these may include *Frangula caroliniana*, *Corylus cornuta*, *Vaccinium stamineum*, *Cercis canadensis*, *Acer rubrum*, *Morus rubra*, and *Lindera benzoin*. The herbaceous stratum may contain *Podophyllum peltatum*, *Toxicodendron radicans*, *Polystichum acrostichoides*, *Maianthemum racemosum* ssp. *racemosum*, and *Desmodium* spp. (specifically *Desmodium pauciflorum* and *Desmodium nudiflorum*).

**ENVIRONMENTAL DESCRIPTION****USFWS Wetland System:**

**Chickamauga-Chattanooga National Military Park Environment:** This oak forest was sampled once in the park on a gentle slope with a northern aspect in the western portion of Chickamauga Battlefield. This is a mesic site with deep soils over sandstone at an elevation of about 250 m (820 feet). Soil pH is assumed to be slightly acidic.

**Global Environment:** The slope aspects that these communities occur on are northwest to east which create the mesic conditions that this community requires.

**VEGETATION DESCRIPTION**

**Chickamauga-Chattanooga National Military Park Vegetation:** The canopy is strongly dominated by *Quercus alba* with lesser amounts of *Quercus rubra* and *Carya alba*. Subcanopy and understory species include *Acer saccharum*, *Oxydendrum arboreum*, *Cornus florida*, and *Sassafras albidum*. The shrub layer is sparse with mostly transgressive species from the canopy. The herbaceous layer is moderately well-developed and diverse with *Desmodium nudiflorum*, *Polystichum acrostichoides*, *Collinsonia canadensis*, *Hepatica nobilis* var. *obtusata*, *Polygonatum biflorum*, *Dichanthelium bosci*, and *Maianthemum racemosum*.

**Global Vegetation:** The canopy is generally closed (>75% cover). Other species that may be regularly present in the canopy are *Fagus grandifolia*, *Fraxinus americana*, *Quercus rubra*, and *Quercus velutina*. In addition, canopy species that may be infrequently present are *Pinus virginiana*, *Quercus prinus*, *Aesculus flava*, *Nyssa sylvatica*, *Quercus falcata*, *Quercus muehlenbergii*, *Tilia americana* var. *heterophylla*, *Pinus echinata*, *Pinus strobus*, *Prunus serotina*, *Quercus coccinea*, *Ulmus alata*, *Juglans nigra*, *Tsuga canadensis*, and *Ulmus rubra*. Subcanopy species that may be present are *Carya glabra*, *Quercus alba*, *Ostrya virginiana*, *Asimina triloba*, *Nyssa sylvatica*, *Fagus grandifolia*, *Tsuga canadensis*, *Oxydendrum arboreum*, *Ulmus alata*, *Cornus florida*, *Juniperus virginiana*, *Liquidambar styraciflua*, and *Prunus serotina*. The subcanopy has a percent cover of less than 50%. *Acer saccharum* strongly dominates the subcanopy. In the Tellico Pilot Project this species had a relative frequency value of >90% and an average canopy cover dominance of >25%. It is speculated that this high dominance is due to the mesic site conditions and suppression of fire. The shrub and herbaceous layers tend to have a percent cover of >25%. The shrub layers may contain small stems of species found in the canopy and subcanopy as well as the following: *Morus rubra*, *Frangula caroliniana*, *Vaccinium stamineum*, *Cercis canadensis*, *Acer rubrum*, and *Lindera benzoin*. The herbaceous strata may contain *Podophyllum peltatum*, *Toxicodendron radicans*, *Polystichum acrostichoides*, *Maianthemum racemosum* ssp. *racemosum*, *Desmodium pauciflorum*, and *Desmodium nudiflorum*.

A stand on the western edge of the Blue Ridge (Cherokee National Forest, Tennessee, M221Dd418, Dry Branch #1) contains *Quercus alba*, *Carya ovata*, *Fraxinus americana*, *Quercus rubra*, *Aesculus flava*, *Juniperus virginiana* var. *virginiana*, *Juglans nigra*, and *Quercus stellata* in the canopy; *Ostrya virginiana*, *Cercis canadensis*, *Ulmus rubra*, *Fraxinus americana*, *Ulmus alata*, *Quercus prinus*, and *Juniperus virginiana* var. *virginiana* in the subcanopy; *Frangula caroliniana* as a tall shrub; *Symphoricarpos orbiculatus* and *Vaccinium stamineum* in the low-shrub stratum; *Parthenocissus quinquefolia* as a woody vine; and *Bromus pubescens*, *Elymus hystrix*, *Carex* sp., *Carex pennsylvanica*, *Sedum ternatum*, *Asplenium platyneuron*, *Hybanthus concolor*, *Carex communis*, *Dichanthelium boscii* (= *Panicum boscii*), *Asplenium resiliens*, *Symphytotrichum undulatum* (= *Aster undulatus*), *Dioscorea quaternata*, *Solidago caesia*, *Galium circaezans*, *Antennaria plantaginifolia*, *Pellaea atropurpurea*, *Verbesina occidentalis*, *Scutellaria elliptica*, *Arabis* sp., *Agrimonia* sp., *Geum* sp., *Symphytotrichum divaricatum* (= *Aster divaricatus*), *Conyza canadensis*, *Hepatica nobilis* var. *obtusata*, *Maianthemum racemosum*, *Monarda fistulosa*, *Sanicula canadensis*, *Solidago erecta* (= *Solidago speciosa* var. *erecta*), *Viola X palmata*, and *Thalictrum* sp. as herbs.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus alba</i>
Tree subcanopy	Broad-leaved deciduous tree	<i>Oxydendrum arboreum</i>

##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Carya alba</i> , <i>Carya glabra</i> , <i>Carya ovata</i> , <i>Liriodendron tulipifera</i> , <i>Quercus alba</i>
Tree subcanopy	Broad-leaved deciduous tree	<i>Acer saccharum</i> , <i>Carya alba</i> , <i>Carya ovata</i> , <i>Fraxinus americana</i>

#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Acer saccharum*, *Carya alba*, *Desmodium nudiflorum*, *Dichanthelium boscii*, *Oxydendrum arboreum*, *Polystichum acrostichoides*, *Quercus alba*, *Quercus rubra*, *Sassafras albidum*

**Global:** *Fagus grandifolia*

#### OTHER NOTEWORTHY SPECIES

**Chickamauga-Chattanooga National Military Park:**

**Global:**

### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G4 (14-Jan-2000). This is not an inherently rare forest type. It is presumed to be relatively common throughout its known range. It is at least a moderately widespread type, although its full range is not known. It occurs on a variety of aspects and elevations, and it is not restricted to any highly specific geologic substrates. It is poorly documented through EOs, and not much data are available on the specific condition of examples of this type. Some stands have been impacted by removal of more valuable timber species and loss of herbaceous species diversity from the disturbance effects of logging. In all probability, most examples which are not on public land have been repeatedly logged and their composition altered thereby. Remaining unprotected examples are threatened by timber removal, conversion to other managed forest types, and/or development into residential or commercial real estate. The Rank was formerly G3G5. Changing this to G4 helps to clarify its status.

### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

#### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** Originally described from Tellico Pilot Project (Ridge and Valley of Tennessee, northeastern Monroe County; 26 stands sampled) as the *Quercus alba* - *Carya ovata* - *Carya alba* Forest, where it was recorded from slopes with northwestern, northern and eastern aspects at elevations from 820-1000 feet. The high dominance of *Acer saccharum* in the subcanopy of some stands is thought to be due to the mesic site conditions combined with fire suppression. More information is needed on the variability of this community across its range. Described from Ridge and Valley, the concept is generally applied to forests in the Southern Cumberlands and adjacent Interior Low Plateau, but the range of variability is not fully understood. This is an unglaciated equivalent of a Midwestern element of glaciated landscapes, *Quercus alba* - *Quercus rubra* - *Carya ovata* Glaciated Forest (CEGL002068) of Indiana, Illinois, and Missouri north to Ontario. A related drier forest association is *Quercus alba* - *Quercus rubra* - *Carya ovata* / *Cercis canadensis* - *Juniperus virginiana* var. *virginiana* Forest (CEGL007240). May be similar to some limestone forests in Virginia's Ridge and Valley (*Acer saccharum* var. *saccharum* - *Quercus rubra* - *Carya [glabra, ovata]* / *Ageratina altissima* Forest (Fleming 1999)) (G. Fleming pers. comm.). In addition, the association has been identified in the far western edge of the Great Smoky Mountains National Park at a southerly aspect at about 1870 feet in elevation.

#### Global Similar Associations:

*Acer saccharum* - *Quercus muehlenbergii* / *Cercis canadensis* Forest (CEGL006017)--is a drier association found to the North and East.

*Quercus alba* - *Quercus rubra* - *Carya (alba, ovata)* / *Cornus florida* Acid Forest (CEGL002067)

*Quercus alba* - *Quercus rubra* - *Carya ovata* / *Cercis canadensis* - *Juniperus virginiana* var. *virginiana* Forest (CEGL007240)--is a related drier forest association.

*Quercus alba* - *Quercus rubra* - *Carya ovata* Glaciated Forest (CEGL002068)--is an equivalent of glaciated landscapes of the Midwest.

*Quercus alba* - *Quercus velutina* - *Carya (ovata, alba, glabra)* - *Pinus* sp. Forest (CEGL007231)

*Quercus prinus* - *Quercus rubra* - *Carya* spp. - *Fraxinus americana* / *Cercis canadensis* / *Solidago sphacelata* Forest (CEGL008549)

*Quercus rubra* - *Acer saccharum* - *Liriodendron tulipifera* Forest (CEGL006125)--has a more northeasterly distribution.

#### Global Related Concepts:

*Quercus alba* - *Carya ovata* - *Carya alba* Forest (Andreu and Tukman 1995) ?

IA6i. Interior Upland Dry-Mesic Oak - Hickory Forest (Allard 1990) B

Mesic White Oak Type (Schmalzer and DeSelm 1982) =

Mesotrophic Forest (Rawinski 1992) B

White Oak - Northern Red Oak, RV (Pyne 1994) B

White Oak: 53 (Eyre 1980) B

### OTHER COMMENTS

#### Other Comments:

### ELEMENT DISTRIBUTION

**Chickamauga-Chattanooga National Military Park Range:** To date, the association has only been documented at Chickamauga Battlefield but could potentially occur on mesic and protected sites on Lookout Mountain.

**Global Range:** At least a moderately widespread type, this association is probably present throughout the Ridge and Valley and possibly adjoining ecoregions. A comprehensive review of related types is not complete.

**Nations:** US

**States/Provinces:** AL, GA, KY, TN, VA?

**USFS Ecoregions:** 221Ha:CCC, 221Hc:CCC, 221He:CCC, 221Ja:CCP, 221Jb:CCC, 222Eb:PPP, 231Cc:CCC, 231Dc:CCC, M221Dd:CCC

**Federal Lands:** DOE (Oak Ridge); NPS (Chickamauga-Chattanooga, Great Smoky Mountains, Obed, Russell Cave); TVA (Tellico); USFS (Chattahoochee, Chattahoochee (Southern Blue Ridge), Cherokee, Daniel Boone)

### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.18.

**Local Description Authors:** T. Govus

**Global Description Authors:** M. Andreu and M. Tukman, mod. M. Pyne

**References:** Allard 1990, Andreu and Tukman 1995, Eyre 1980, Fleming 1999, Fleming pers. comm., NatureServe Ecology - Southeastern U.S. unpubl. data, Pyne 1994, Rawinski 1992, Schmalzer and DeSelm 1982, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

### Highland Rim White Oak - Tuliptree Mesic Lower Slope Forest

*Quercus alba* - *Carya (alba, ovata)* - *Liriodendron tulipifera* - (*Quercus phellos*) / *Cornus florida* Forest

White Oak - (Mockernut Hickory, Shagbark Hickory) - Tuliptree - (Willow Oak) / Flowering Dogwood Forest

Identifier: CEGL007709

### 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>Carya (alba, ovata)</i> - <i>Liriodendron tulipifera</i> - ( <i>Quercus phellos</i> ) / <i>Cornus florida</i>
Association (English name)	White Oak - (Mockernut Hickory, Shagbark Hickory) - Tuliptree - (Willow Oak) / Flowering
	Dogwood Forest
Association (Common name)	Highland Rim White Oak - Tuliptree Mesic Lower Slope Forest
<b>Ecological System(s):</b>	East Gulf Coastal Plain Northern Mesic Hardwood Slope Forest (CES203.477) South-Central Interior Small Stream and Riparian (CES202.706)

### ELEMENT CONCEPT

**Global Summary:** This community is associated with lower, more mesic slopes and higher floodplain terraces of major creeks in the Interior Low Plateau and Upper East Gulf Coastal Plain of Tennessee and the Cumberlands and Southern Ridge and Valley of Georgia. The dominant canopy species include *Quercus alba*, *Liriodendron tulipifera*,

*Liquidambar styraciflua*, and/or *Quercus phellos*, as well as *Acer rubrum*, *Carya alba*, *Carya ovata*, *Juglans nigra*, *Quercus nigra*, and *Ulmus americana*. Some earlier successional examples may exhibit relative dominance by *Liriodendron* and/or *Liquidambar* rather than *Quercus* and/or *Carya*. The subcanopy is typically well-developed with canopy species, as well as *Cornus florida*, *Prunus serotina*, *Nyssa sylvatica*, and *Platanus occidentalis*. The shrub strata may include *Lindera benzoin*, *Symphoricarpos orbiculatus*, *Euonymus americanus*, *Asimina triloba*, *Carpinus caroliniana*, *Rhododendron canescens*, *Ilex opaca*, and *Toxicodendron radicans*. The herbaceous layer is often well-developed (up to 90% cover in a 20x20-m plot) but can also be rather sparse. Dominant herbs may include *Thelypteris noveboracensis*, *Osmunda cinnamomea*, *Osmunda regalis*, *Polystichum acrostichoides*, *Athyrium filix-femina ssp. asplenioides*, *Boehmeria cylindrica*, *Chasmanthium laxum*, *Poa sylvestris*, and *Carex intumescens*. The exotic grass *Microstegium vimineum* may also be dominant in some occurrences.

### ENVIRONMENTAL DESCRIPTION

#### USFWS Wetland System:

**Chickamauga-Chattanooga National Military Park Environment:** This association is found along small streams in the western portion of Chickamauga Battlefield in association with sandstone. These are mesic, acidic environments that are likely only temporarily flooded for short durations. Elevations range from about 220 to 230 m (720-750 feet).

**Global Environment:** This community is associated with lower, more mesic slopes and higher floodplain terraces of major creeks in the Interior Low Plateau and Upper East Gulf Coastal Plain of Tennessee and possibly adjacent states. It occurs on a variety of soil types. On Arnold Air Force Base (Coffee and Franklin counties, Tennessee) this community is found on lower, more mesic slopes and higher floodplain terraces of major creeks such as Crumpton, Brumalow, Hunt, and Rowland creeks.

### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** The canopy of examples studied are dominated by *Quercus alba*, with lesser amounts of *Liquidambar styraciflua*, *Carya glabra*, *Acer rubrum*, *Nyssa sylvatica*, *Quercus phellos*, *Quercus prinus*, and *Pinus echinata* occurring in the canopy and subcanopy. The shrub layer tends to be sparse and primarily made up of transgressive species from upper strata. *Rhododendron canescens*, *Euonymus americanus*, *Vaccinium arboreum*, *Vaccinium pallidum*, and *Frangula caroliniana* are additional shrub species recorded for this association. The herbaceous layer is sparse to moderately well-developed with species associated with acidic and slightly flooded environments. *Chasmanthium laxum*, *Glyceria striata*, *Symphyotrichum lateriflorum*, *Polystichum acrostichoides*, *Vernonia flaccidifolia*, *Polygonatum biflorum*, *Dioscorea quaternata*, and *Hypoxis hirsuta* are some of the more frequently occurring species. The edges of the stream are characterized by abundant sphagnum. The exotic *Microstegium vimineum* is also present in moderate abundance.

**Global Vegetation:** The dominant canopy species in stands of this association include *Quercus alba*, *Liriodendron tulipifera*, *Liquidambar styraciflua*, and/or *Quercus phellos*, as well as *Acer rubrum*, *Carya alba*, *Carya ovata*, *Juglans nigra*, *Quercus nigra*, and *Ulmus americana*. Some earlier-successional examples may exhibit relative dominance by *Liriodendron* and/or *Liquidambar* rather than *Quercus* spp. and/or *Carya* spp. The subcanopy is typically well-developed with canopy species, as well as *Cornus florida*, *Prunus serotina*, *Nyssa sylvatica*, and *Platanus occidentalis*. The shrub strata may include *Lindera benzoin*, *Symphoricarpos orbiculatus*, *Euonymus americanus*, *Asimina triloba*, *Carpinus caroliniana*, *Rhododendron canescens*, *Ilex opaca*, and *Toxicodendron radicans*. Stands from Shiloh National Military Park were described as having a "very sparse" shrub stratum which included *Alnus serrulata*, *Lindera benzoin*, *Fraxinus pennsylvanica*, *Viburnum* sp., *Vaccinium fuscum*, and *Rhododendron canescens*. The herbaceous layer is often well-developed (up to 90% cover in a 20x20-m plot) but can also be rather sparse. Dominant herbs may include *Thelypteris noveboracensis*, *Osmunda cinnamomea*, *Osmunda regalis*, *Polystichum acrostichoides*, *Athyrium filix-femina ssp. asplenioides*, *Boehmeria cylindrica*, *Chasmanthium laxum*, *Poa sylvestris*, and *Carex intumescens*. Other herbs include *Brachyelytrum erectum*, *Amphicarpaea bracteata*, *Mitchella repens*, *Dioscorea villosa*, *Arisaema triphyllum*, *Stellaria pubera*, *Trillium cuneatum*, *Podophyllum peltatum*, *Elephantopus carolinianus*, *Sanicula canadensis*, *Galium* spp., *Houstonia* spp., *Scutellaria integrifolia*, *Lysimachia quadrifolia*, *Tipularia discolor*, *Symphyotrichum* sp., *Eupatorium* sp., *Asplenium platyneuron*, and *Geum canadense*. The exotic grass *Microstegium vimineum* may also be dominant in some occurrences.

**MOST ABUNDANT SPECIES****Chickamauga-Chattanooga National Military Park**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Liquidambar styraciflua</i> , <i>Quercus alba</i>
Tree subcanopy	Broad-leaved deciduous tree	<i>Acer rubrum</i>

**Global**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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**CHARACTERISTIC SPECIES**

**Chickamauga-Chattanooga National Military Park:** *Acer rubrum*, *Chasmanthium laxum*, *Euonymus americanus*, *Glyceria striata*, *Liquidambar styraciflua*, *Nyssa sylvatica*, *Polystichum acrostichoides*, *Quercus alba*, *Quercus phellos*, *Rhododendron canescens*, *Symphyotrichum lateriflorum*

**Global:****OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:****Global:****CONSERVATION STATUS RANK**

**Global Rank & Reasons:** G4 (18-Jan-2000). This is not an inherently rare forest type. It is presumed to be relatively common throughout its known range. It occurs on a variety of soil types and is somewhat generally distributed in upper floodplain terraces and lower slopes in parts of the Interior Low Plateau and Upper East Gulf Coastal Plain as well as in the Cumberlands and Southern Ridge and Valley. There are still some questions about the full extent of its global distribution and its relationship to related types. It is poorly documented through EOs, and not much data are available on the specific condition of examples of this type. Some stands have been impacted by removal of more valuable timber species (e.g., *Quercus alba*) and loss of herbaceous species diversity from the disturbance effects of logging. The Rank was formerly G3G5. Changing this to G4 helps to clarify its status.

**CLASSIFICATION**

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** On Arnold Air Force Base (Coffee and Franklin counties, Tennessee) this community is found on lower, more mesic slopes and higher floodplain terraces of major creeks such as Crumpton, Brumalow, Hunt, and Rowland creeks.

**Global Similar Associations:**

*Liquidambar styraciflua* - (*Liriodendron tulipifera*) Temporarily Flooded Forest (CEGL007330)  
*Quercus phellos* - *Quercus nigra* - *Quercus alba* / *Chasmanthium (laxum, sessiliflorum)* Forest (CEGL004771)--in  
*Quercus (phellos, nigra, laurifolia)* Temporarily Flooded Forest Alliance (A.292).

**Global Related Concepts:****OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This association has been documented from Chickamauga Battlefield but could potentially occur at Lookout Mountain.

**Global Range:** At least a moderately widespread type, it is present in parts of the Interior Low Plateau and Upper East Gulf Coastal Plain as well as in the Cumberlands and Southern Ridge and Valley. A comprehensive review of its relationship to related types is not complete.

**Nations:** US

**States/Provinces:** AL?, GA, TN

**USFS Ecoregions:** 222Cg:CCC, 222Eb:CCC, 222Ec:CC?, 222Eg:CCP, 231Bc:CC?, 231Bd:CCP, 231Be:CCP, 232:?

**Federal Lands:** DOD (Arnold); NPS (Chickamauga-Chattanooga, Natchez Trace)

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.01.

**Local Description Authors:** T. Govus

**Global Description Authors:** M. Pyne and M. Russo

**References:** NatureServe Ecology - Southeastern U.S. unpubl. data, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, TNC 1998a

### Ridge and Valley Dry-Mesic White Oak - Hickory Forest

*Quercus alba* - *Quercus rubra* - *Carya ovata* / *Cercis canadensis* - *Juniperus virginiana* var. *virginiana* Forest

White Oak - Northern Red Oak - Shagbark Hickory / Eastern Redbud - Eastern Red-cedar Forest

Identifier: CEGL007240

#### 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 ovata</i> / <i>Cercis canadensis</i> - <i>Juniperus virginiana</i> var.
	<i>virginiana</i> Forest
Association (English name)	White Oak - Northern Red Oak - Shagbark Hickory / Eastern Redbud - Eastern Red-cedar Forest
Association (Common name)	Ridge and Valley Dry-Mesic White Oak - Hickory Forest
<b>Ecological System(s):</b>	Allegheny-Cumberland Dry Oak Forest and Woodland (CES202.359) Southern Appalachian Oak Forest (CES202.886) Southern Ridge and Valley / Cumberland Dry Calcareous Forest (CES202.457)

#### ELEMENT CONCEPT

**Global Summary:** This dry-mesic late-successional Appalachian forest occurs on slopes with southerly aspects and well-drained upland soils. The canopy is dominated by *Quercus alba*, *Quercus rubra*, *Carya ovata*, and *Carya alba*. Other *Quercus* species are common in the canopy (*Quercus falcata*, *Quercus stellata*, *Quercus coccinea*, *Quercus muehlenbergii*, and *Quercus velutina*). Other canopy species can include *Pinus virginiana*, *Pinus echinata*, *Juniperus virginiana* var. *virginiana*, *Quercus prinus*, *Liriodendron tulipifera*, and *Fraxinus americana*. A mixture of calciphilic and acidophilic trees are present in the subcanopy, including *Juniperus virginiana* var. *virginiana*, *Cercis canadensis* var. *canadensis*, *Acer leucoderme*, *Nyssa sylvatica*, *Cornus florida*, *Acer rubrum*, and *Oxydendrum arboreum*. *Acer saccharum*, *Acer nigrum*, or *Acer leucoderme* are sometimes present in the canopy and are often common in the lower strata (subcanopy, tall-shrub, and low-shrub). Other species in the shrub strata include *Cornus florida*, *Juniperus virginiana* var. *virginiana*, *Ulmus alata*, *Cercis canadensis* var. *canadensis*,

*Vaccinium stamineum*, *Vaccinium arboreum*, *Viburnum rufidulum*, *Frangula caroliniana*, and *Ostrya virginiana*. The herbaceous layer can be moderately dense to somewhat sparse. Possible herbaceous species are *Polystichum acrostichoides*, *Hexastylis arifolia* var. *ruthii*, *Dioscorea quaternata*, *Galium circaezans*, *Maianthemum racemosum* ssp. *racemosum*, *Parthenocissus quinquefolia*, *Toxicodendron radicans*, *Zizia aptera*, *Chamaelirium luteum*, *Desmodium nudiflorum*, *Desmodium rotundifolium*, and other *Desmodium* species.

### ENVIRONMENTAL DESCRIPTION

#### USFWS Wetland System:

#### Chickamauga-Chattanooga National Military Park Environment:

**Global Environment:** This dry-mesic late-successional Appalachian forest occurs on slopes with southerly or westerly aspects and well-drained upland soils. This association is not (at this time) explicitly restricted to any particular geological substrates or soil types. This would be valuable information, as the flora seems to be at least somewhat oriented to a circumneutral substrate.

This forest is most often found on slopes with elevation ranging from 250 to 305 m (820-1000 feet) with a westerly aspect. Topographical position ranges from low slope to high slope. Slopes range from gentle to very steep (0-40+ degrees). These stands are underlain by soils weathered from calcareous shale and calcareous sandstone of the Middle Ordovician. These soils are slightly to very acidic and well-drained. Soil series of this type are Dandridge (Lithic Ruptic-Alfic Eutrochrepts), Tellico (Typic Rhododults), and Steekee (Ruptic-Ultic Dystrochrepts). These soils are slightly to very acidic and well drained to very well drained. Average depth of solum ranges from 43 cm (17 inches) (Dandridge series) to 147 cm (58 inches) (Tellico series). The combination of environmental factors and well-drained soils results in dry-mesic site conditions.

### VEGETATION DESCRIPTION

#### Chickamauga-Chattanooga National Military Park Vegetation:

**Global Vegetation:** The canopy is generally closed (>75% cover) with gaps resulting from natural disturbance (i.e., mudslides, fire) and is dominated by *Quercus alba*, *Quercus rubra*, *Carya ovata*, and *Carya alba*. Other *Quercus* species are common in the canopy (*Quercus falcata*, *Quercus stellata*, *Quercus coccinea*, *Quercus muehlenbergii*, and *Quercus velutina*). Other canopy species can include *Pinus virginiana*, *Pinus echinata*, *Juniperus virginiana* var. *virginiana*, *Quercus prinus*, *Liriodendron tulipifera*, and *Fraxinus americana*. A mixture of calciphilic and acidophilic trees are present in the subcanopy, including *Juniperus virginiana* var. *virginiana*, *Cercis canadensis* var. *canadensis*, *Acer leucoderme*, *Nyssa sylvatica*, *Cornus florida*, *Acer rubrum*, and *Oxydendrum arboreum*. *Acer saccharum*, *Acer nigrum*, or *Acer leucoderme* are sometimes present in the canopy and are often common in the lower strata (subcanopy, tall-shrub, and low-shrub). Other species in the shrub strata include *Cornus florida*, *Juniperus virginiana* var. *virginiana*, *Ulmus alata*, *Cercis canadensis* var. *canadensis*, *Vaccinium stamineum*, *Vaccinium arboreum*, *Viburnum rufidulum*, *Frangula caroliniana*, and *Ostrya virginiana*. The herbaceous layer can be moderately dense to somewhat sparse. Possible herbaceous species are *Polystichum acrostichoides*, *Hexastylis arifolia* var. *ruthii*, *Dioscorea quaternata*, *Galium circaezans*, *Maianthemum racemosum* ssp. *racemosum*, *Parthenocissus quinquefolia*, *Toxicodendron radicans*, *Zizia aptera*, *Chamaelirium luteum*, *Desmodium nudiflorum*, *Desmodium rotundifolium*, and other *Desmodium* species.

### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
<b>Global</b>		
<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree (canopy & subcanopy)	Broad-leaved deciduous tree	<i>Carya ovata</i>
Tree canopy	Needle-leaved tree	<i>Pinus virginiana</i>
Tree canopy	Broad-leaved deciduous tree	<i>Carya glabra</i> , <i>Quercus alba</i> , <i>Quercus rubra</i>
Tree subcanopy	Needle-leaved tree	<i>Juniperus virginiana</i>
Tree subcanopy	Broad-leaved deciduous tree	<i>Acer saccharum</i> , <i>Fraxinus americana</i>
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Acer saccharum</i>
Shrub/sapling (tall & short)	Vine/Liana	<i>Parthenocissus quinquefolia</i> , <i>Toxicodendron radicans</i>

Tall shrub/sapling	Needle-leaved shrub	<i>Juniperus virginiana</i>
Tall shrub/sapling	Broad-leaved deciduous shrub	<i>Carya alba</i> , <i>Cornus florida</i> , <i>Ulmus alata</i>
Short shrub/sapling	Broad-leaved deciduous shrub	<i>Cercis canadensis</i> , <i>Fraxinus americana</i> , <i>Ostrya virginiana</i>
Herb (field)	Dwarf-shrub	<i>Chimaphila maculata</i>

#### CHARACTERISTIC SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:** *Juniperus virginiana*, *Pinus virginiana*, *Quercus coccinea*, *Quercus falcata*, *Quercus muehlenbergii*, *Quercus stellata*, *Quercus velutina*

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:**

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G4 (14-Jan-2000). This is not an inherently rare forest type. It is at least moderately widespread, and it is presumed to be relatively common throughout its range, although its full range is not known. It occurs on a variety of aspects and elevations, and it is not restricted to any highly specific geologic substrates. It is poorly documented through EOs, and not much data are available on the specific condition of examples of this type. Some stands have been impacted by removal of more valuable timber species and loss of herbaceous species diversity from the disturbance effects of logging. The Rank was formerly G3G5. Changing this to G4 helps to clarify its status and indicates that it is not a rare type.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

##### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** Described from Tellico Pilot Project (Ridge and Valley of Tennessee, northeastern Monroe County; 50 stands sampled) (Andreu and Tukman 1995). *Juniperus virginiana* var. *virginiana* is included in the name to indicate the relative xeric nature of this forest, until more information is available to define understory indicator species. This association is related to *Quercus alba* - (*Quercus rubra*, *Acer saccharum*, *Fagus grandifolia*) / *Aesculus flava* Forest (CEGL007233), a more mesic type described from the Tellico Pilot Project. May be similar to some limestone forests in Virginia's Ridge and Valley (G. Fleming pers. comm. 1997).

##### Global Similar Associations:

*Quercus alba* - (*Quercus rubra*, *Acer saccharum*, *Fagus grandifolia*) / *Aesculus flava* Forest (CEGL007233)

*Quercus alba* - *Quercus rubra* - *Quercus muehlenbergii* / *Cercis canadensis* Forest (CEGL002070)--is an apparently related type, but with chinquapin oak.

*Quercus alba* - *Quercus velutina* - *Carya* (*ovata*, *alba*, *glabra*) - *Pinus* sp. Forest (CEGL007231)

*Quercus prinus* - *Quercus rubra* - *Carya* spp. - *Fraxinus americana* / *Cercis canadensis* / *Solidago sphacelata* Forest (CEGL008549)

##### Global Related Concepts:

IA6i. Interior Upland Dry-Mesic Oak - Hickory Forest (Allard 1990) B

Mixed Oak - Hickory Forest (Ambrose 1990a) B

Oak - Hickory Forest (Oberholster 1993) B

White Oak - Northern Red Oak, RV (Pyne 1994) B

White Oak: 53 (Eyre 1980) B

#### OTHER COMMENTS

**Other Comments:**

### ELEMENT DISTRIBUTION

**Chickamauga-Chattanooga National Military Park Range:** This association was observed by photointerpreters, but no formal plots were taken, at Chickamauga Battlefield.

**Global Range:** This association is at least a moderately widespread type, probably present throughout the Ridge and Valley from Alabama to Tennessee and possibly to Virginia, as well as adjacent Southern Blue Ridge. A comprehensive review of related types has not been completed.

**Nations:** US

**States/Provinces:** AL?, GA, KY?, TN, VA?

**USFS Ecoregions:** 221Hc:CCC, 221Jb:CCC, 222E:??, 231Cc:CCC, 231Da:CCC, 231Dc:CCC, M221Dd:CCC

**Federal Lands:** DOE (Oak Ridge); NPS (Big South Fork, Chickamauga-Chattanooga, Cumberland Gap, Great Smoky Mountains); TVA (Tellico); USFS (Chattahoochee, Chattahoochee (Southern Blue Ridge), Cherokee, Daniel Boone?)

### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** none.

**Local Description Authors:**

**Global Description Authors:** M. Andreu and M. Tukman

**References:** Allard 1990, Ambrose 1990a, Andreu and Tukman 1995, Eyre 1980, Fleming pers. comm., NatureServe Ecology - Southeastern U.S. unpubl. data, Oberholster 1993, Pyne 1994, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

### Appalachian White Oak - Southern Red Oak Forest

*Quercus alba* - *Quercus falcata* / *Vaccinium (arboreum, hirsutum, pallidum)* Forest

White Oak - Southern Red Oak / (Farkleberry, Hairy Blueberry, Hillside Blueberry) Forest

Identifier: CEGL008567

#### 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>Vaccinium (arboreum, hirsutum, pallidum)</i>
Forest	
Association (English name)	White Oak - Southern Red Oak / (Farkleberry, Hairy Blueberry, Hillside Blueberry) Forest
Association (Common name)	Appalachian White Oak - Southern Red Oak Forest

**Ecological System(s):** Allegheny-Cumberland Dry Oak Forest and Woodland (CES202.359)  
Southern Appalachian Oak Forest (CES202.886)

### ELEMENT CONCEPT

**Global Summary:** This is a dry-mesic, deciduous white oak - southern red oak forest found at lower elevations (200-550 m; 700-1800 feet) in the Ridge and Valley and the adjacent southern part of the Southern Blue Ridge, in Tennessee and possibly adjacent Georgia. This includes the gentle slopes and shallow dry-mesic drains of the more-

or-less flat metasedimentary surface of Chilhowee Mountain, Tennessee. The canopy is dominated by *Quercus alba* and *Quercus falcata*, possibly with *Quercus stellata* and *Quercus velutina*, typically with lower cover by *Quercus stellata*, *Quercus coccinea*, and/or *Quercus muehlenbergii*. The hickory species *Carya alba*, *Carya glabra*, and *Carya ovata* may also be present or codominant. Dominance by pines (e.g., *Pinus echinata*, *Pinus strobus*, *Pinus virginiana*) should be less than 25%. The subcanopy typically contains *Oxydendrum arboreum*, *Nyssa sylvatica*, *Acer rubrum*, *Carya glabra*, and *Pinus strobus*. Shrubs and other woody plants that may be present include *Carya pallida*, *Cornus florida*, *Rhododendron calendulaceum*, *Tsuga canadensis*, *Sassafras albidum*, *Ostrya virginiana*, *Amelanchier arborea*, and *Magnolia fraseri*.

### ENVIRONMENTAL DESCRIPTION

#### USFWS Wetland System:

#### Chickamauga-Chattanooga National Military Park Environment:

**Global Environment:** These dry-mesic forests are found at lower elevations (200-550 m [700-1800 feet]) in the Ridge and Valley and the adjacent southern part of the Southern Blue Ridge, in Tennessee and possibly adjacent Georgia. This includes the gentle slopes and shallow dry-mesic drains of the more-or-less flat metasedimentary surface of Chilhowee Mountain, Tennessee. Chilhowee Mountain is regarded as being somewhat more like the adjacent Ridge and Valley than like the majority of the Southern Blue Ridge. Classed by Keys et al. (1995) as part of M221Dd but by EPA (2004) as part of a separate Level IV Ecoregion 66e.

### VEGETATION DESCRIPTION

#### Chickamauga-Chattanooga National Military Park Vegetation:

**Global Vegetation:** The canopy of stands of this type is dominated by *Quercus alba* and *Quercus falcata*, possibly with *Quercus stellata* and *Quercus velutina*, typically with lower cover by *Quercus stellata*, *Quercus coccinea*, and/or *Quercus muehlenbergii*. The hickory species *Carya alba*, *Carya glabra*, and *Carya ovata* may also be present or codominant. Dominance by pines (e.g., *Pinus echinata*, *Pinus strobus*, *Pinus virginiana*) should be less than 25%. The subcanopy typically contains *Oxydendrum arboreum*, *Nyssa sylvatica*, *Acer rubrum*, *Carya glabra*, and *Pinus strobus*. Shrubs and other woody plants that may be present include *Carya pallida*, *Cornus florida*, *Rhododendron calendulaceum*, *Tsuga canadensis*, *Sassafras albidum*, *Ostrya virginiana*, *Amelanchier arborea*, and *Magnolia fraseri*. In the Southern Blue Ridge of southeastern Tennessee (e.g., on Chilhowee Mountain), the low-shrub layer may be dominated by *Vaccinium hirsutum*; outside of the limited range of this species, the shrub strata may contain other ericaceous shrubs such as *Vaccinium arboreum* and *Vaccinium pallidum*. Other shrubs include *Smilax glauca*. Vines include *Vitis rotundifolia*. Herbs include *Mitchella repens*, *Dichanthelium* sp., *Eupatorium* sp., *Iris verna*, *Smilax glauca*, *Solidago odora*, *Pleopeltis polypodioides* ssp. *michauxiana*, *Hypericum hypericoides* ssp. *multicaule*, *Chasmanthium sessiliflorum*, *Viola* sp., and *Botrychium virginianum*. Additional herbs include *Coreopsis major*, *Houstonia purpurea*, *Ipomoea pandurata*, *Lobelia puberula*, *Lysimachia quadrifolia*, and *Stenanthium gramineum*.

In a stand in the Cherokee National Forest (John Muir Trail #2), the canopy contains *Quercus alba*, *Quercus falcata*, and *Quercus stellata*. The subcanopy contains *Oxydendrum arboreum*, *Nyssa sylvatica*, *Acer rubrum*, *Carya glabra*, and *Pinus strobus*. Shrubs include *Vaccinium arboreum*, *Tsuga canadensis*, *Vaccinium pallidum*, *Sassafras albidum*, *Ostrya virginiana*, *Amelanchier arborea*, and *Magnolia fraseri*. Vines include *Vitis rotundifolia*. Herbs include *Mitchella repens*, *Dichanthelium* sp., *Eupatorium* sp., *Iris verna*, *Smilax glauca*, *Solidago odora*, *Pleopeltis polypodioides* ssp. *michauxiana*, *Hypericum hypericoides* ssp. *multicaule*, *Chasmanthium sessiliflorum*, *Viola* sp., and *Botrychium virginianum*. Plots assigned to this type from Tellico Pilot Project (Ridge and Valley of Tennessee) (Andreu and Tukman 1995) are variably dominated by *Quercus alba*, *Quercus velutina*, and *Quercus falcata*, typically with lower cover by *Quercus stellata*, *Quercus coccinea*, and *Quercus muehlenbergii*. The hickory species *Carya alba*, *Carya glabra*, and *Carya ovata* may also be present or codominant. These stands may also contain *Liriodendron tulipifera*, *Liquidambar styraciflua*, *Pinus virginiana*, *Pinus echinata* in their canopies, and *Oxydendrum arboreum*, *Juniperus virginiana*, *Nyssa sylvatica*, *Cornus florida*, *Cercis canadensis*, and *Fagus grandifolia* in their subcanopies. Data from lower strata were not consistently developed in this study.

### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

##### Stratum

##### Lifeform

##### Species

Global

**Stratum****Lifeform****Species****CHARACTERISTIC SPECIES****Chickamauga-Chattanooga National Military Park:****Global:****OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:****Global:** *Vaccinium hirsutum***CONSERVATION STATUS RANK**

**Global Rank & Reasons:** G3G4 (17-May-2002). This is not an inherently rare forest type, but it is somewhat restricted in range (Ridge and Valley and adjacent Southern Blue Ridge in southern Tennessee and probably adjacent Georgia). It is presumed to be relatively common throughout its known range, but this may be limited in extent. Not much data are available on the specific condition of examples of this type. Some limited examples are found in the Cherokee (and possibly) Chattahoochee national forests. Stands are threatened by removal of commercially valuable timber species (e.g., *Quercus alba*, *Quercus falcata*, *Quercus stellata*, *Carya* spp.).

**CLASSIFICATION****Status:** Standard**Classification Confidence:** 2 - Moderate**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** This type is peripheral in the Southern Blue Ridge, being more typical of the Ridge and Valley and better developed and distributed in the Ridge and Valley. Stands assigned here should be primarily deciduous-dominated; greater than 25% dominance by pines (e.g., *Pinus echinata*, *Pinus strobus*, *Pinus virginiana*) would lead to assignment to a related mixed evergreen-deciduous type (e.g., CEG007517, CEG008427). This forest seems to be distinct because no element from this alliance has been previously described from the Ridge and Valley and the southern part of the Southern Blue Ridge; the alliance is better developed in the Coastal Plain and other related ecoregions.

**Global Similar Associations:**

*Pinus echinata* - *Quercus alba* / *Vaccinium pallidum* / *Hexastylis arifolia* - *Chimaphila maculata* Forest (CEGL008427)--with *Pinus echinata* codominant.

*Pinus strobus* - *Quercus alba* - (*Carya alba*) / *Gaylussacia ursina* Forest (CEGL007517)--with *Pinus strobus* codominant.

*Quercus alba* - *Quercus (coccinea, velutina, prinus)* / *Gaylussacia baccata* Forest (CEGL008521)--generally without *Quercus falcata*; originally described from Virginia, ranging into eastern Tennessee (as of 2005).

*Quercus falcata* - *Quercus alba* - *Carya alba* / *Oxydendrum arboreum* / *Vaccinium stamineum* Forest (CEGL007244)--of the Piedmont, Interior Low Plateau, upper Coastal Plains.

**Global Related Concepts:****OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION****Chickamauga-Chattanooga National Military Park Range:**

**Global Range:** This association is thought to be mostly restricted to the Ridge and Valley and lower elevations of the southern end of the adjacent Southern Blue Ridge in Tennessee and presumably adjacent Georgia.

**Nations:** US**States/Provinces:** GA?, TN**USFS Ecoregions:** 221Jb:CCC, 231De:???, M221Dd:CCC

**Federal Lands:** NPS (Chickamauga-Chattanooga?); TVA (Tellico); USFS (Chattahoochee (Southern Blue Ridge)?, Chattahoochee?, Cherokee)

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:**

**Local Description Authors:**

**Global Description Authors:** M. Pyne

**References:** Andreu and Tukman 1995, EPA 2004, Keys et al. 1995, NatureServe Ecology - Southeastern U.S. unpubl. data, Southeastern Ecology Working Group n.d., TDNH unpubl. data

#### White Oak - Post Oak Subcalcareous Forest

*Quercus alba* - *Quercus stellata* / *Ostrya virginiana* - *Acer barbatum* / *Chasmanthium sessiliflorum*  
Forest

White Oak - Post Oak / Eastern Hop-hornbeam - Southern Sugar Maple / Longleaf Spikegrass Forest

Identifier: CEGL008443

#### 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 stellata</i> / <i>Ostrya virginiana</i> - <i>Acer barbatum</i> / <i>Chasmanthium sessiliflorum</i>
	Forest
Association (English name)	White Oak - Post Oak / Eastern Hop-hornbeam - Southern Sugar Maple /
Longleaf Spikegrass	Forest
Association (Common name)	White Oak - Post Oak Subcalcareous Forest

**Ecological System(s):** Allegheny-Cumberland Dry Oak Forest and Woodland (CES202.359)  
Southern Ridge and Valley / Cumberland Dry Calcareous Forest (CES202.457)

#### ELEMENT CONCEPT

**Global Summary:** This dry oak-hickory forest occurs on subcalcareous substrates in northern Alabama, northwestern Georgia, and possibly adjacent states. It is dominated by *Quercus alba* and *Quercus stellata*, with other canopy components including *Quercus shumardii*, *Quercus rubra*, *Carya glabra*, *Carya alba*, and *Pinus echinata*. The subcanopy is well-developed and consists of *Ostrya virginiana*, *Acer barbatum*, *Nyssa sylvatica*, *Ulmus alata*, and *Juniperus virginiana* var. *virginiana*. Shrubs and woody vines include *Vaccinium stamineum*, *Crataegus* sp., *Toxicodendron radicans*, and *Smilax glauca*. Herbs can include *Chasmanthium sessiliflorum*, *Dichanthelium boscii*, *Dichanthelium* spp., and *Carex* spp.

#### ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:**

**Chickamauga-Chattanooga National Military Park Environment:** This association occurs on the tops of low ridges on well-drained soils associated with dolomites of the Knox and Chickamauga groups at elevations of around 220 m (720 feet). Examples studied have a fairly strong component of loblolly pine that has been killed by southern pine beetle, indicating that these areas are recovered from past clearing.

**Global Environment:** This association occurs on dry (upper slope, south-facing) sites over mixtures of calcareous and non-calcareous rocks, or over subcalcareous rocks. A stand from the 'Red Knobs' landform in a small portion of the Ridge and Valley (221Jb) which is part of the Cherokee National Forest has been attributed to this type.

#### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** The canopy of examples studied are strongly dominated by a mixture of *Quercus alba* and *Quercus stellata*. The subcanopy and understory are fairly well-developed and include *Ulmus alata*, *Acer barbatum*, *Juniperus virginiana* var. *virginiana*, *Carya caroliniae-septentrionalis*, and *Fraxinus americana*. The shrub layer is sparse with mostly hardwood species from the canopy but also including *Cercis canadensis* and *Symphoricarpos orbiculatus*. The herb layer also tends to be sparse; leaf litter generally comprises most of the ground cover. Some of the herbaceous species that do occur include *Chasmanthium laxum*, *Ruellia caroliniensis*, *Scleria* sp., *Aristolochia serpentaria*, and *Mitchella repens*. Vines are moderately well-represented with *Toxicodendron radicans*, *Vitis rotundifolia*, and *Smilax rotundifolia* fairly frequent.

**Global Vegetation:** This forest has a closed canopy, dominated by *Quercus alba* and *Quercus stellata*, with other canopy components including *Quercus shumardii*, *Quercus rubra*, *Carya glabra*, *Carya alba*, and *Pinus echinata* (NatureServe Ecology unpubl. data). The subcanopy is well-developed and consists of *Ostrya virginiana*, *Acer barbatum*, *Nyssa sylvatica*, *Ulmus alata*, and *Juniperus virginiana* var. *virginiana*. Shrubs and woody vines include *Vaccinium stamineum*, *Crataegus* sp., *Toxicodendron radicans*, and *Smilax glauca*. Herbs can include *Chasmanthium sessiliflorum*, *Dichantheium boscii*, *Dichantheium* spp., and *Carex* spp. A stand tentatively assigned here from the Talladega National Forest contains *Carya alba*, *Acer leucoderme*, and some other taxa which were not part of the original description, but the plot is generally compatible with this type.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus alba</i> , <i>Quercus stellata</i>
Tree subcanopy	Needle-leaved tree	<i>Juniperus virginiana</i> var. <i>virginiana</i>
Herb (field)	Graminoid	<i>Chasmanthium laxum</i>

##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Acer barbatum*, *Cercis canadensis*, *Chasmanthium laxum*, *Juniperus virginiana* var. *virginiana*, *Quercus alba*, *Quercus stellata*, *Ulmus alata*

**Global:**

#### OTHER NOTEWORTHY SPECIES

**Chickamauga-Chattanooga National Military Park:**

**Global:** *Juglans cinerea*

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G3G4 (4-Jan-2001). This is not an inherently rare forest type; it needs additional rangewide assessment. This community is known from calcareous and subcalcareous areas of the southern Cumberland and Southern Ridge and Valley provinces of Alabama and probably southern Tennessee and northwestern Georgia. It is presumed to be relatively common throughout its known range. Not much data are available on the specific condition of examples of this type. There are still questions about the full extent of its global distribution and its relationship to related types. A comprehensive review of its relationship to related types is not complete. Some stands have been impacted by removal of more valuable timber species (e.g., *Quercus alba*, *Quercus rubra*, *Quercus shumardii*, *Quercus stellata*) and the loss of herbaceous species diversity by the disturbance effects of logging. The Rank was formerly G3?. Changing it to G3G4 makes it evident that any uncertainty about the rank is in the direction of being more common rather than more rare.

**CLASSIFICATION****Status:** Standard**Classification Confidence:** 2 - Moderate**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** This community needs additional rangewide assessment. It occurs in the same landscape as *Quercus muehlenbergii* - *Quercus shumardii* - *Carya (carolinae-septentrionalis, ovata)* Forest (CEGL007808), *Quercus alba* - *Quercus rubra* - *Quercus muehlenbergii* / *Cercis canadensis* Forest (CEGL002070), and *Quercus shumardii* - *Quercus muehlenbergii* - *Acer (barbatum, leucoderme, saccharum)* / *Ostrya virginiana* Forest (CEGL008442). It is moister and less extremely calcareous than CEGL007808, somewhat drier and less calcareous than CEGL002070, and much drier and less calcareous than CEGL008442.

**Global Similar Associations:**

*Quercus alba* - *Quercus rubra* - *Quercus muehlenbergii* / *Cercis canadensis* Forest (CEGL002070)  
*Quercus muehlenbergii* - *Quercus shumardii* - *Carya (carolinae-septentrionalis, ovata)* Forest (CEGL007808)  
*Quercus shumardii* - *Quercus muehlenbergii* - *Acer (barbatum, leucoderme, saccharum)* / *Ostrya virginiana* Forest (CEGL008442)

**Global Related Concepts:****OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This association was documented only once at Chickamauga Battlefield.

**Global Range:** This community is known from calcareous and subcalcareous areas of the southern Cumberlands and Southern Ridge and Valley provinces of Alabama, southern Tennessee, and probably northwestern Georgia.

**Nations:** US**States/Provinces:** AL, GA, TN**USFS Ecoregions:** 221Jb:CCC, 231Cd:CCC**Federal Lands:** NPS (Chickamauga-Chattanooga); USFS (Bankhead, Cherokee, Oconee?, Talladega (Talladega)?, Talladega?)**ELEMENT SOURCES****Chickamauga-Chattanooga National Military Park Inventory Notes:****Chickamauga-Chattanooga National Military Park Plots:** CHCH.02.**Local Description Authors:** T. Govus**Global Description Authors:** A.S. Weakley, mod. M. Pyne**References:** NatureServe Ecology - Southeastern U.S. unpubl. data, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data**Southeastern Interior Southern Red Oak - Post Oak Forest***Quercus falcata* - *Quercus (coccinea, stellata)* / *Vaccinium (pallidum, stamineum)* Forest

Southern Red Oak - (Scarlet Oak, Post Oak) / (Hillside Blueberry, Deerberry) Forest

Identifier: CEGL007247

**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 falcata</i> Forest Alliance (A.243)
Alliance (English name)	Southern Red Oak Forest Alliance
Association	<i>Quercus falcata</i> - <i>Quercus (coccinea, stellata)</i> / <i>Vaccinium (pallidum, stamineum)</i> Forest
Association (English name)	Southern Red Oak - (Scarlet Oak, Post Oak) / (Hillside Blueberry, Deerberry) Forest
Association (Common name)	Southeastern Interior Southern Red Oak - Post Oak Forest
<b>Ecological System(s):</b>	Allegheny-Cumberland Dry Oak Forest and Woodland (CES202.359) Southern Interior Low Plateau Dry-Mesic Oak Forest (CES202.898)

### ELEMENT CONCEPT

**Global Summary:** This oak forest is typically codominated by *Quercus falcata*, *Quercus coccinea*, and/or *Quercus stellata*. Other canopy associates vary across its range. Additional *Quercus* species may be present in the canopy and/or subcanopy (e.g., *Quercus velutina* and *Quercus marilandica* in the Cumberland and Interior Low plateaus; *Quercus alba*, *Quercus rubra*, or *Quercus muehlenbergii* in the Ridge and Valley or other more montane or submontane situations) along with several *Carya* species (e.g., *Carya alba*, *Carya ovata*, *Carya carolinae-septentrionalis*, or *Carya glabra*). The canopy may contain substantial coverage by *Pinus* spp. (e.g., *Pinus virginiana*, *Pinus echinata*), as well as *Liriodendron tulipifera*, *Fraxinus americana*, *Acer barbatum*, and/or *Acer saccharum*. The subcanopy is relatively dense, with coverage of 25-60%. Subcanopy species may include *Acer rubrum*, *Cornus florida*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Fraxinus americana*, *Nyssa sylvatica*, *Oxydendrum arboreum*, *Prunus serotina* var. *serotina*, and *Sassafras albidum*. *Juniperus virginiana* var. *virginiana* may be prominent in the subcanopy and shrub layers of fire-suppressed examples. Shrubs may include *Vaccinium pallidum*, *Vaccinium stamineum*, *Vaccinium arboreum*, *Gaylussacia baccata*, and rarely *Gaylussacia dumosa*. Calcareous examples may have coverage by *Frangula caroliniana* and *Symphoricarpos orbiculatus*. Herbaceous species present nearly always include *Smilax glauca*, *Rhus copallinum*, *Toxicodendron radicans*, *Vitis rotundifolia*, and *Chimaphila maculata*. Other typical herbs include *Aristolochia serpentaria*, *Symphytichum dumosum* (= *Aster dumosus*), *Clitoria mariana*, *Cypripedium acaule*, *Desmodium nudiflorum*, *Euphorbia corollata*, *Galium circaezans*, *Ipomoea pandurata*, *Solidago odora*, *Tephrosia virginiana*, *Potentilla simplex*, *Porteranthus stipulatus*, *Pteridium aquilinum*, *Piptochaetium avenaceum*, *Lespedeza* spp., *Dichanthelium* spp., *Coreopsis major*, *Mimosa microphylla* (= *Schrankia microphylla*), and *Hypericum hypericoides*.

### ENVIRONMENTAL DESCRIPTION

#### USFWS Wetland System:

**Chickamauga-Chattanooga National Military Park Environment:** This association occurs on the tops of low rolling ridgetops of dolomitic limestone and sandstone. Most sites range from xeric to dry-mesic. At Chickamauga Battlefield, these sites typically were heavily impacted in the past by clearing and/or grazing. The elevation is approximately 220 m (720 feet).

**Global Environment:** This association occurs on flat to gently rolling topography in the Interior Low Plateau of Tennessee and on xeric, lower slopes in Tennessee's Ridge and Valley. In the Cumberland Plateau of Alabama it is found on flat, sandstone nose slopes with a calcareous influence.

### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** Examples studied have a canopy strongly dominated by either *Quercus falcata* and/or *Quercus stellata* with lesser amounts of *Pinus echinata*, *Carya glabra*, and *Fraxinus americana*. The subcanopy and understory layers are very dense with *Pinus virginiana*, *Juniperus virginiana* var. *virginiana*, *Carya alba*, and *Ulmus rubra*. The shrub layer is also well-developed and largely dominated by hardwood species from the canopy and understory, especially *Ulmus alata*. Other minor shrub species include *Symphoricarpos orbiculatus* and *Frangula caroliniana*. The herbaceous layer is sparse and patchy, with

*Schizachyrium scoparium*, *Aristolochia serpentaria*, *Ruellia caroliniensis*, *Galium circaezans*, *Piptochaetium avenaceum* and *Smilax glauca* as the most frequently occurring species.

**Global Vegetation:** Stands of this forest are typically codominated by *Quercus falcata*, *Quercus coccinea*, and/or *Quercus stellata*. Other *Quercus* species may be present in the canopy and/or subcanopy (*Quercus velutina* and *Quercus marilandica* in the Cumberland and Interior Low plateaus; *Quercus alba*, *Quercus rubra*, or *Quercus muehlenbergii* in the Ridge and Valley or other more montane or submontane situations) along with several *Carya* species (*Carya alba*, *Carya ovata*, *Carya carolinae-septentrionalis*, or *Carya glabra*). The canopy, particularly of Ridge and Valley examples, may contain *Pinus virginiana* and/or *Pinus echinata*, as well as *Liriodendron tulipifera*, *Fraxinus americana*, and *Acer saccharum*. The subcanopy is relatively dense, with a coverage of 25-60%. Subcanopy species may include *Acer rubrum*, *Cornus florida*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Fraxinus americana*, *Nyssa sylvatica*, *Oxydendrum arboreum*, *Prunus serotina* var. *serotina*, and *Sassafras albidum*. *Juniperus virginiana* var. *virginiana* is prominent in the subcanopy and shrub layers of fire-suppressed Ridge and Valley examples. The low-shrub layer of Interior Low Plateau examples may be sparse or dense, consisting mostly of ericaceous shrubs such as *Vaccinium pallidum*, *Vaccinium stamineum*, *Vaccinium arboreum*, *Gaylussacia baccata*, and rarely *Gaylussacia dumosa*. Herbaceous species nearly always present include *Smilax glauca*, *Rhus copallinum*, *Toxicodendron radicans*, *Vitis rotundifolia*, and *Chimaphila maculata*. Other typical herbs include *Aristolochia serpentaria*, *Symphotrichum dumosum* (= *Aster dumosus*), *Clitoria mariana*, *Cypripedium acaule*, *Desmodium nudiflorum*, *Euphorbia corollata*, *Galium circaezans*, *Ipomoea pandurata*, *Solidago odora*, *Tephrosia virginiana*, *Potentilla simplex*, *Porteranthus stipulatus*, *Pteridium aquilinum*, *Lespedeza* spp., *Dichanthelium* spp., *Coreopsis major*, *Mimosa microphylla* (= *Schrankia microphylla*), and *Hypericum hypericoides*.

In the Bankhead National Forest of Alabama, this is a dry ridge forest with a canopy dominated by *Quercus falcata*, *Quercus stellata*, *Carya alba*, *Pinus echinata*, and *Pinus virginiana*. *Quercus prinus*, *Quercus velutina*, and *Quercus alba* can also have a minor presence in the canopy. The subcanopy is dominated by *Carya alba*, *Cornus florida*, and *Nyssa sylvatica*. The shrub layer indicates a possible calcareous influence with *Celtis occidentalis*, *Chionanthus virginicus*, and *Frangula caroliniana*. Other shrubs are *Vaccinium arboreum*, *Vaccinium pallidum*, and *Viburnum acerifolium*. Vines include *Parthenocissus quinquefolia*, *Toxicodendron radicans*, and *Vitis rotundifolia*. The herb stratum is sparse and includes *Sericocarpus asteroides* (= *Aster paternus*), *Dioscorea quaternata*, *Piptochaetium avenaceum*, *Pityopsis graminifolia*, *Ruellia caroliniensis*, *Silphium trifoliatum*, and *Solidago odora* var. *odora*.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus falcata</i> , <i>Quercus stellata</i>
Tall shrub/sapling	Broad-leaved deciduous shrub	<i>Frangula caroliniana</i> , <i>Symphoricarpos orbiculatus</i>

##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Carya alba*, *Frangula caroliniana*, *Fraxinus americana*, *Quercus falcata*, *Quercus stellata*, *Ruellia caroliniensis*, *Symphoricarpos orbiculatus*

**Global:**

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:**

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G4 (14-Jan-2000). This is not an inherently rare forest type. It is at least a moderately widespread type and is presumed to be relatively common throughout its range, although its full range is not known. It occurs on a variety of aspects and elevations, and it is not restricted to any highly specific geologic substrates. This type is poorly documented through EOs, and not much data are available on the specific condition of its examples. Some stands have been impacted by removal of more valuable timber species (e.g., *Quercus falcata*) and

the loss of herbaceous species diversity from the disturbance effects of logging. The Grank was formerly G3G4. Changing this to G4 helps to clarify its status and indicates that it is not a rare type.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:** The example documented here has been impacted by past land clearing and probably grazing. It also occurs on more calcareous substrates (dolomites of the Knox Group) than more typical examples. Many examples have a large component of white oak. This is a widespread matrix type that occupies large portions of Chickamauga Battlefield and will surround and grade into the cedar glade complex.

**Global Comments:** This association was originally defined from flat to gently rolling topography at Arnold Air Force Base, Coffee County, Tennessee, and later expanded to include TVA Tellico lands, where it is a common successional forest type on xeric lower slopes below 900 feet. It was subsequently expanded to include *Quercus falcata* - *Quercus stellata* forests found on sandstone ridges in Alabama's Cumberland Plateau.

**Global Similar Associations:**

*Quercus falcata* - *Quercus alba* - *Quercus stellata* - *Quercus velutina* Forest (CEGL005018)

*Quercus falcata* - *Quercus stellata* - *Carya alba* / *Vaccinium* spp. Coastal Plain Forest (CEGL007246)--of the Coastal Plain.

**Global Related Concepts:**

Southern Red Oak, RV (Pyne 1994) B

#### OTHER COMMENTS

**Other Comments:**

#### ELEMENT DISTRIBUTION

**Chickamauga-Chattanooga National Military Park Range:** To date, this association has only been documented in the rolling low terrain of Chickamauga Battlefield.

**Global Range:** At least a moderately widespread type, present in the Interior Low Plateau and Cumberlands/Southern Ridge and Valley at least from Kentucky to Alabama.

**Nations:** US

**States/Provinces:** AL, GA, KY, TN

**USFS Ecoregions:** 222Dg:CCC, 222Eb:CCC, 222Ej:CCC, 222El:CCC, 231Cd:CCC, 231Cg:CCC

**Federal Lands:** DOD (Arnold); NPS (Chickamauga-Chattanooga, Little River Canyon, Mammoth Cave); TVA (Tellico); USFS (Bankhead, Cherokee?)

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.10.

**Local Description Authors:** T. Govus

**Global Description Authors:** M. Pyne and A.S. Weakley, mod. T. Govus

**References:** Evans 1991, Pyne 1994, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, TNC 1998a

#### Appalachian Sugar Maple - Chinquapin Oak Limestone Forest

*Acer saccharum* - *Quercus muehlenbergii* / *Cercis canadensis* Forest

Sugar Maple - Chinquapin Oak / Eastern Redbud Forest

Identifier: C EGL006017

**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 muehlenbergii</i> - ( <i>Acer saccharum</i> ) Forest Alliance (A.1912)
Alliance (English name)	Chinquapin Oak - (Sugar Maple) Forest Alliance
Association	<i>Acer saccharum</i> - <i>Quercus muehlenbergii</i> / <i>Cercis canadensis</i> Forest
Association (English name)	Sugar Maple - Chinquapin Oak / Eastern Redbud Forest
Association (Common name)	Appalachian Sugar Maple - Chinquapin Oak Limestone Forest
<b>Ecological System(s):</b>	Central Interior Highlands Calcareous Glade and Barrens (CES202.691) Central Appalachian Alkaline Glade and Woodland (CES202.602)

**ELEMENT CONCEPT**

**Global Summary:** This calciphilic maple-oak forest is found in the Central Appalachians and adjacent regions of the eastern United States, ranging south and west to the Interior Low Plateau of Tennessee and the Cumberlands of Alabama. Stands occur in thin soils over calcareous substrates, sometimes in association with limestone glades. These are typically closed-canopy, rich, dry to dry-mesic forests; in some stands the canopy may vary from closed to somewhat open, particularly in Pennsylvania at the northern edge of the range. In the Mid-Atlantic region, stands occupying the driest sites are commonly open and somewhat intermediate in physiognomy between forest and woodland. The stands are primarily composed of *Acer saccharum*, *Quercus muehlenbergii*, *Fraxinus americana*, and *Ostrya virginiana*. Associates include *Quercus alba*, *Tilia americana*, *Acer nigrum*, *Ulmus rubra*, *Celtis occidentalis*, *Carya ovalis*, and *Carya ovata*. *Quercus prinus* may also be present in some examples. A variable subcanopy and shrub layer contains *Cornus florida*, *Cercis canadensis*, *Hamamelis virginiana*, *Rosa carolina*, *Rhus aromatica*, *Viburnum prunifolium*, *Viburnum rafinesquianum*, *Viburnum rufidulum*, and *Zanthoxylum americanum*. The sparse to well-developed herb layer may contain *Danthonia spicata*, *Elymus hystrix*, *Bouteloua curtipendula*, *Ageratina altissima* (= *Eupatorium rugosum*), *Antennaria plantaginifolia*, *Aquilegia canadensis*, *Arabis laevigata*, *Asclepias quadrifolia*, *Clematis occidentalis* (to the north), *Houstonia longifolia* (= *Houstonia tenuifolia*), *Polygonum scandens*, *Sanicula canadensis*, *Saxifraga virginiana*, and *Packera obovata* (= *Senecio obovatus*). Some other herbs recorded in Virginia examples include *Agrimonia rostellata*, *Anemone virginiana* var. *virginiana*, *Symphotrichum patens* var. *patens* (= *Aster patens* var. *patens*), *Bromus pubescens*, *Dichanthelium boscii*, *Erigeron pulchellus* var. *pulchellus*, *Galium circaezans*, *Sanicula canadensis*, *Scutellaria elliptica*, and *Solidago ulmifolia* var. *ulmifolia*. Some stands attributed to this type are mesic forests of steep slopes in the southern Ridge and Valley which are dominated by *Acer saccharum* and some combination of *Quercus alba* and/or *Quercus muehlenbergii* with *Liriodendron tulipifera*, *Carya* spp., and *Aesculus flava* in either the canopy or subcanopy. The same, or related forests, are reported from limestones of the lower Cumberland Plateau escarpment of Tennessee and possibly Alabama.

**ENVIRONMENTAL DESCRIPTION****USFWS Wetland System:**

**Chickamauga-Chattanooga National Military Park Environment:** This association is found on the lower slopes of Lookout Mountain and Missionary Ridge (Sherman Reservation) on limestone substrates in situations that are highly impacted by the proximity of urban environments (edge effects and non-native species). Elevations vary from 290 to 335 m (950-1100 feet).

**Global Environment:** This association is typically found on upper slopes or summits of limestone, dolomite, or marble ridges with dry soils. Along the New River in West Virginia, it is found in small patches on lower to middle gorge slopes eroded from calcareous geologic formations. These are alkaline forests associated with calcareous soils, often surrounding, or in association with, limestone or dolomite glades. The soils are well-drained, dry, and shallow with outcrops or boulders often present. In the Ridge and Valley and Central Appalachians of Virginia (Fleming 1999), stands of this type are evidently confined to substrates weathered from limestone and dolomite, most frequently occupying submesic to subxeric, southeast- to west-facing slopes at relatively low elevations (mean

= 569 m [1867 feet]). These habitats usually appear to be quite dry, rocky, and at least somewhat exposed. The stands are most often situated on middle slopes but range into both lower and upper slope topographic positions. The slope shape is typically convex in at least one direction. Soils are yellow-brown to reddish-brown clay loams and silty clay loams; soil reaction ranges from strongly acid (pH 5.3) to mildly alkaline (pH 7.4), with mean calcium (Ca) levels of 2474 ppm. In soils weathered from dolomite, magnesium (Mg) levels may exceed 1000 ppm (Fleming 1999). Soil chemistry analyzed from the one WV plot at New River Gorge had high pH (6.8) and high levels of total cation-exchange capacity, calcium (4180 ppm), potassium (121 ppm), and magnesium (424 ppm) compared to most other soils nearby.

### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** The canopy and subcanopy of examples studied are dominated by *Fraxinus americana*, *Acer saccharum*, and *Quercus muehlenbergii*. Other important tree or subcanopy species include *Carya caroliniae-septentrionalis*, *Carya cordiformis*, *Ulmus rubra*, and *Quercus alba*. The understory tends to be sparse and open, including the species listed above along with *Celtis laevigata*, *Ostrya virginiana*, and *Halesia tetraptera* var. *monticola*. The shrub layer is sparse to patchy with *Cercis canadensis*, *Frangula caroliniana*, *Rhus aromatica*, and *Juniperus virginiana* var. *virginiana*. The herbaceous layer tends to be sparse, with *Symphotrichum cordifolium*, *Spigelia marilandica*, *Bromus pubescens*, *Brachyelytrum erectum*, *Amsonia tabernaemontana*, and *Uvularia perfoliata* as the most frequently occurring species. Vines present include *Passiflora lutea*, *Cocculus carolinus*, *Bignonia capreolata*, and *Parthenocissus quinquefolia*. Because of the proximity of these examples to highways and urban environments, non-native species can be abundant, including *Lonicera maackii*, *Ligustrum sinense* and *Lonicera japonica*.

**Global Vegetation:** The tall, closed-canopy stands are primarily composed of *Acer saccharum*, *Quercus muehlenbergii*, *Fraxinus americana*, and *Ostrya virginiana*. Associates include *Quercus alba*, *Tilia americana*, *Acer nigrum*, *Ulmus rubra*, *Aesculus flava*, *Celtis occidentalis*, *Carya ovalis*, *Carya cordiformis*, and *Carya ovata*. *Quercus prinus* may also be present in some examples. At the northern end of the type's range in Pennsylvania, stands occupying the driest sites are commonly open and somewhat intermediate in physiognomy between forest and woodland. A variable subcanopy and shrub layer contains *Cornus florida*, *Cercis canadensis*, *Carpinus caroliniana*, *Lindera benzoin*, *Hamamelis virginiana*, *Rosa carolina*, *Rhus aromatica*, *Viburnum prunifolium*, *Viburnum rafinesquianum*, *Viburnum rufidulum*, and *Zanthoxylum americanum*. The sparse to well-developed herb layer is usually species-rich and may contain *Danthonia spicata*, *Elymus hystrix*, *Bouteloua curtipendula*, *Ageratina altissima* (= *Eupatorium rugosum*), *Antennaria plantaginifolia*, *Aquilegia canadensis*, *Arabis laevigata*, *Asclepias quadrifolia*, *Clematis occidentalis* (to the north), *Houstonia longifolia* (= *Houstonia tenuifolia*), *Polygonum scandens*, *Sanicula canadensis*, *Saxifraga virginensis*, and *Packera obovata* (= *Senecio obovatus*). Some other herbs recorded in Virginia examples include *Agrimonia rostellata*, *Anemone virginiana* var. *virginiana*, *Symphotrichum patens* var. *patens* (= *Aster patens* var. *patens*), *Bromus pubescens*, *Dichanthelium boscii*, *Erigeron pulchellus* var. *pulchellus*, *Galium circaezans*, *Sanicula canadensis*, *Scutellaria elliptica*, and *Solidago ulmifolia* var. *ulmifolia*. Some additional taxa that are relatively constant in the broad type are *Asplenium platyneuron*, *Botrychium virginianum*, *Carex blanda*, *Actaea racemosa* (= *Cimicifuga racemosa*), *Galium triflorum*, *Hybanthus concolor*, *Maianthemum racemosum*, *Polygonatum biflorum*, *Polymnia canadensis*, *Ranunculus recurvatus*, and *Sanguinaria canadensis*. In addition, *Muhlenbergia sobolifera* may dominate the herbaceous stratum of some stands.

### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Acer saccharum</i> , <i>Fraxinus americana</i> , <i>Quercus muehlenbergii</i>
Tall shrub/sapling	Broad-leaved deciduous shrub	<i>Celtis laevigata</i>

#### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Acer saccharum*, *Amsonia tabernaemontana*, *Brachyelytrum erectum*, *Bromus pubescens*, *Carya caroliniae-septentrionalis*, *Carya cordiformis*, *Celtis laevigata*, *Fraxinus americana*, *Ostrya virginiana*, *Quercus muehlenbergii*

**Global:** *Acer nigrum*, *Bromus pubescens*, *Erigeron pulchellus*, *Hybanthus concolor*, *Muhlenbergia tenuiflora*, *Packera obovata*, *Quercus muehlenbergii*, *Solidago ulmifolia*, *Thalictrum dioicum*, *Ulmus rubra*

#### OTHER NOTEWORTHY SPECIES

#### Chickamauga-Chattanooga National Military Park:

**Global:** *Arabis patens*, *Carex purpurifera*, *Delphinium exaltatum*, *Desmodium cuspidatum*, *Lithospermum latifolium*, *Melica nitens*

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G4? (19-Oct-2000). This forest is widely but somewhat locally distributed throughout its range in suitable calcareous habitats. The type often occurs in relatively small, sometimes linear, patches except where carbonate substrates are more continuously exposed, for example on low hills and knobs (Fleming 1999). There is very little requisite habitat for this vegetation in the George Washington and Jefferson national forests of Virginia; hence the type can be considered rare there. The largest occurrences on these national forests are probably in the Clinch Ranger District.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:** Plots attributed to this association at Lookout Mountain and Sherman Reservation are fairly degraded due to their close proximity to highways and urban environments. The Sherman Reservation plot resembles the mesic, steep slopes of the Ridge and Valley described in the Global Classification Comments.

**Global Comments:** The range of this type, which was initially described from "the High Alleghenies," has gradually extended south to at least the Interior Low Plateau. It may require subdivision. (This type was formerly attributed questionably to the Upper East Gulf Coastal Plain.) Some stands attributed to this type are mesic forests of steep slopes in the southern Ridge and Valley which are dominated by *Acer saccharum* and some combination of *Quercus alba* and/or *Quercus muehlenbergii* with *Liriodendron tulipifera*, *Carya* spp., and *Aesculus flava* in either the canopy or subcanopy (Andreu and Tukman 1995). The same, or related forests, are reported from limestones of the lower Cumberland Plateau escarpment of Tennessee and possibly Alabama (Bowen et al. 1995). There has been discussion of the merits of subdividing this type, in effect re-splitting former *Acer saccharum* - *Quercus* (*alba*, *muehlenbergii*) / *Aesculus flava* Forest (CEGL006136) (or an equivalent) out of it again.

#### Global Similar Associations:

*Acer saccharum* - *Carya ovata* - *Juglans nigra* / *Symphoricarpos orbiculatus* / *Polymnia canadensis* - *Bromus pubescens* Forest (CEGL004741)--related forest of the Tennessee Nashville Basin.

*Acer saccharum* - *Quercus muehlenbergii* / *Carex platyphylla* Forest (CEGL006162)--a northern variant in southern New England and New York.

*Acer saccharum* - *Quercus muehlenbergii* Forest (CEGL005010)--more northerly.

*Fraxinus americana* - *Carya ovata* / *Frangula caroliniana* / *Helianthus hirsutus* Woodland (CEGL008458)

*Quercus alba* - (*Quercus rubra*, *Acer saccharum*, *Fagus grandifolia*) / *Aesculus flava* Forest (CEGL007233)--a more mesic forest found to the south and west.

*Quercus muehlenbergii* - *Carya* spp. / *Ostrya virginiana* Upper East Gulf Coastal Plain Forest (CEGL003903)

*Quercus muehlenbergii* - *Quercus* (*alba*, *rubra*) - *Carya cordiformis* / *Viburnum prunifolium* Forest (CEGL004793)--clearly related.

*Quercus muehlenbergii* - *Quercus* (*falcata*, *shumardii*, *stellata*) / *Cercis canadensis* / *Viburnum rufidulum* Forest (CEGL007699)--more oak-dominated.

#### Global Related Concepts:

*Acer saccharum* - *Quercus* (*alba*, *muehlenbergii*) Forest (Andreu and Tukman 1995) ?

*Acer saccharum* - *Quercus muehlenbergii* / *Houstonia longifolia* Forest (Walton et al. 1997) ?

*Quercus muehlenbergii* - *Acer* (*nigrum*, *saccharum*) / *Ostrya virginiana* / *Erigeron pulchellus* - *Packera obovata* Forest (Fleming and Coulling 2001) =

*Quercus muehlenbergii* / *Juniperus virginiana* / *Hybanthus concolor* Association (Rawinski et al. 1996) F

*Quercus muhlenbergii* - *Acer* (*nigrum*, *saccharum* var. *saccharum*) / *Ostrya virginiana* / *Senecio obovatus* Forest,  
Type 3.1 (Fleming 1999) =  
Yellow oak-sugar maple-red bud forest of calcareous upper slopes and summits (CAP pers. comm. 1998) ?

#### OTHER COMMENTS

##### Other Comments:

#### ELEMENT DISTRIBUTION

**Chickamauga-Chattanooga National Military Park Range:** This association has been located on Lookout Mountain and the Sherman Reservation (Missionary Ridge).

**Global Range:** This maple - oak forest is found in the Central Appalachians and adjacent regions of the eastern United States, including the Ridge and Valley and Western Allegheny Plateau regions, ranging from Pennsylvania southward to the Interior Low Plateau of Tennessee and the Ridge and Valley of Virginia.

**Nations:** US

**States/Provinces:** AL?, GA, KY, MD, OH, PA, TN, VA:S4, WV

**USFS Ecoregions:** 212Fa:???, 212Ga:???, 212Gb:???, 221A:C?, 221D:C?, 221Ea:CCC, 221Hc:CCC, 221Jb:CCC, 222Ej:CPP, 222Fd:CCC, 231B:P?, 231Cc:PPP, M221Aa:CCC, M221Ab:CCC, M221Ac:CCC, M221Bd:CP?, M221Be:CPP, M221Ca:CC?, M221Cb:CCC, M221Cc:CC?, M221Ce:CCC, M221Da:CCC, M221Db:CC?, M221Dc:CCC

**Federal Lands:** NPS (C&O Canal, Chickamauga-Chattanooga, Lincoln Birthplace, Mammoth Cave, New River Gorge); TVA (Tellico); USFS (Cherokee?, Daniel Boone, George Washington, Jefferson)

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.35, CHCH.40.

**Local Description Authors:** T. Govus

**Global Description Authors:** L.A. Sneddon, mod. M. Pyne after Fleming (1999), mod. G.P. Fleming and S.C. Gawler

**References:** Andreu and Tukman 1995, Bartgis 1985a, Bartgis 1993, Bowen et al. 1995, CAP pers. comm. 1998, Eastern Ecology Working Group n.d., Fike 1999, Fleming 1999, Fleming and Coulling 2001, Fleming et al. 2001, Harrison 2004, Rawinski et al. 1996, Schotz pers. comm., TDNH unpubl. data, VDNH 2003, Vanderhorst 2007, Walton et al. 1997

#### Interior Low Plateau Chinquapin Oak - Mixed Oak Forest

*Quercus muehlenbergii* - *Quercus* (*falcata*, *shumardii*, *stellata*) / *Cercis canadensis* / *Viburnum rufidulum* Forest

Chinquapin Oak - (Southern Red Oak, Shumard Oak, Post Oak) / Eastern Redbud / Rusty Blackhaw Forest

Identifier: CEGL007699

#### 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 muehlenbergii</i> - ( <i>Acer saccharum</i> ) Forest Alliance (A.1912)
Alliance (English name)	Chinquapin Oak - (Sugar Maple) Forest Alliance

Association	<i>Quercus muehlenbergii</i> - <i>Quercus (falcata, shumardii, stellata)</i> / <i>Cercis canadensis</i> / <i>Viburnum rufidulum</i> Forest
Association (English name)	Chinquapin Oak - (Southern Red Oak, Shumard Oak, Post Oak) / Eastern Redbud / Rusty
Association (Common name)	Blackhaw Forest Interior Low Plateau Chinquapin Oak - Mixed Oak Forest
<b>Ecological System(s):</b>	Ridge and Valley Calcareous Valley Bottom Glade and Woodland (CES202.024) Southern Interior Low Plateau Dry-Mesic Oak Forest (CES202.898)

#### ELEMENT CONCEPT

**Global Summary:** This chinquapin oak - mixed oak forest association is found in the inner Nashville Basin of central Tennessee and related areas of the Interior Low Plateau of Kentucky, Illinois and Indiana, and in Virginia and marginally into the southern limestone/dolomite valleys of northwestern Georgia. Stands include dry to subxeric forests of flat to rolling topography. Some stands in the Shawnee Hills may have a southerly exposure with thin loess-derived soils. The vegetation is dominated by a mixture of *Quercus muehlenbergii*, *Quercus falcata*, *Quercus shumardii*, and *Quercus stellata*, with *Quercus velutina* in smaller amounts. *Carya carolinae-septentrionalis*, *Carya glabra*, and *Fraxinus americana* may also be present in the canopy, which is typically somewhat open. The relatively open subcanopy contains *Acer saccharum*, *Fraxinus americana*, *Fraxinus quadrangulata*, *Ulmus alata*, *Ulmus serotina*, and *Celtis laevigata*. *Juniperus virginiana* var. *virginiana*, *Viburnum rufidulum*, *Frangula caroliniana*, *Cercis canadensis*, *Ostrya virginiana*, *Sideroxylon lycioides*, *Prunus americana*, and *Prunus angustifolia* are present as tall shrubs or small trees. Coverage of *Juniperus* in the subcanopy may be dense in some examples, but this vegetation is treated here rather than as a mixed forest. Low shrubs include *Rhus aromatica*, *Forestiera ligustrina*, *Viburnum rufidulum*, *Hypericum frondosum*, *Ptelea trifoliata*, and *Symphoricarpos orbiculatus*. Herbs present include *Andropogon* spp., *Antennaria plantaginifolia*, *Symphotrichum shortii* (= *Aster shortii*), *Cheilanthes lanosa*, *Cunila organoides*, *Diarrhena americana*, *Dichanthelium boscii*, *Galium circaezans*, *Heuchera americana*, *Monarda fistulosa*, *Schizachyrium scoparium*, *Scutellaria ovata*, *Solidago missouriensis*, *Solidago sphecelata*, and *Verbesina virginica*. A prominent woody vine is *Bignonia capreolata*. In Tennessee's Nashville Basin, this association is found over Ordovician limestones (Lebanon, Ridley) at about 200 m elevation. This type also includes examples from slopes above limestone cliffs, e.g., bordering the Ohio River in Harrison County (southern Indiana) and possibly adjacent Kentucky (the former CEGLO05020), where *Quercus muehlenbergii* is found with *Fraxinus americana* and *Fraxinus quadrangulata*. This specific example is assumed to be compatible with *Quercus muehlenbergii* - *Quercus (falcata, shumardii, stellata)* / *Cercis canadensis* / *Viburnum rufidulum* Forest (CEGL007699).

#### ENVIRONMENTAL DESCRIPTION

##### USFWS Wetland System:

**Chickamauga-Chattanooga National Military Park Environment:** This association occurs on the tops of gentle, low ridges in a landscape of rolling topography on shallow soils over limestone associated with the Knox Group. This area has had significant historic human impacts such as clearing and grazing in the early and latter parts of the 1800s. These stands now have mature, widely spaced canopy trees and a dense understory that has resulted apparently from fire suppression since this area was acquired as a military park in 1895. Elevations for these occurrences are at approximately 305 m (1000 feet).

**Global Environment:** Stands include dry to subxeric forests of flat to rolling topography. Some stands in the Shawnee Hills may have a southerly exposure with thin loess-derived soils (TNC 1995a). In Tennessee's Nashville Basin, this association is found over Ordovician limestones (Lebanon, Ridley) at about 200 m elevation. At Chickamauga-Chattanooga National Military Park, this association occurs on the tops of gentle, low ridges in a landscape of rolling topography on shallow soils over limestone associated with the Knox Group.

#### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** This association is restricted to the Chickamauga Battlefield and consists of stands with rather open canopies of *Quercus muehlenbergii*, *Quercus falcata*, *Quercus shumardii*, and *Quercus stellata* with lesser amounts of *Quercus velutina* and *Carya ovalis*. The subcanopy and understory include *Quercus marilandica*, *Frangula caroliniana*, *Cercis canadensis*, *Ulmus alata*,

*Juniperus virginiana* var. *virginiana*, *Juglans nigra*, and *Carya carolinae-septentrionalis*. *Symphoricarpos orbiculatus* and *Frangula caroliniana* are the most important shrub species. The herb layer is sparse but includes a fairly diverse assemblage of species. *Piptochaetium avenaceum*, *Monarda fistulosa*, *Verbesina occidentalis*, *Ruellia caroliniensis*, *Dichanthelium boscii*, *Carex cherokeensis*, *Parthenium integrifolium*, and *Cynoglossum virginianum* are some of the more conspicuous species observed.

**Global Vegetation:** The vegetation is dominated by a mixture of *Quercus muehlenbergii*, *Quercus falcata*, *Quercus shumardii*, and *Quercus stellata*, with *Quercus velutina* in smaller amounts. *Carya carolinae-septentrionalis*, *Carya glabra*, and *Fraxinus americana* may also be present in the canopy, which is typically somewhat open. The relatively open subcanopy contains *Acer saccharum*, *Fraxinus americana*, *Fraxinus quadrangulata*, *Ulmus alata*, *Ulmus serotina*, and *Celtis laevigata*. *Juniperus virginiana* var. *virginiana*, *Viburnum rufidulum*, *Frangula caroliniana*, *Cercis canadensis*, *Ostrya virginiana*, *Sideroxylon lycioides*, *Prunus americana*, and *Prunus angustifolia* are present as tall shrubs or small trees. Coverage of *Juniperus* in the subcanopy may be dense in some examples, but this vegetation is treated here rather than as a mixed forest. Low shrubs include *Rhus aromatica*, *Forestiera ligustrina*, *Viburnum rufidulum*, *Hypericum frondosum*, *Ptelea trifoliata*, and *Symphoricarpos orbiculatus*. Herbs present include *Andropogon* spp., *Antennaria plantaginifolia*, *Symphyotrichum shortii* (= *Aster shortii*), *Cheilanthes lanosa*, *Cunila organoides*, *Diarrhena americana*, *Dichanthelium boscii*, *Galium circaezans*, *Heuchera americana*, *Monarda fistulosa*, *Schizachyrium scoparium*, *Scutellaria ovata*, *Solidago missouriensis*, *Solidago sphacelata*, and *Verbesina virginica*. A prominent woody vine is *Bignonia capreolata*. This type also includes examples from slopes above limestone cliffs along the Ohio River in Harrison County (southern Indiana) and possibly adjacent Kentucky (the former CEG005020), where *Quercus muehlenbergii* is found with *Fraxinus americana* and *Fraxinus quadrangulata*.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus falcata</i>
Tall shrub/sapling	Broad-leaved deciduous shrub	<i>Frangula caroliniana</i> , <i>Symphoricarpos orbiculatus</i>

##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Cercis canadensis*, *Dichanthelium boscii*, *Frangula caroliniana*, *Juniperus virginiana* var. *virginiana*, *Quercus falcata*, *Quercus marilandica*, *Quercus muehlenbergii*, *Quercus shumardii*, *Quercus stellata*, *Ruellia caroliniensis*, *Symphoricarpos orbiculatus*, *Ulmus alata*, *Verbesina occidentalis*

##### Global:

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

##### Global:

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G3 (25-Feb-2004). Examples of this association in Tennessee's Nashville Basin occur in areas of rapid human population growth, and remaining unprotected examples are threatened by timber removal and land conversion. Kentucky examples are more scattered in several regions of the state, but many are small examples on isolated ridges. Some examples may be protected on TVA, Army Corps of Engineers, and U.S. National Park Service lands. Some are found within the proclamation boundaries of the Daniel Boone National Forest but may lack protection. Most, if not all, high-quality examples have been eliminated or severely impacted by timber removal, grazing, soil erosion, and fire suppression. Other current threats include windthrow, microclimate modification from intensive silvicultural practices on adjacent uplands, forest type conversion, and herbicide use.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** See also the *Quercus muehlenbergii* Woodland Alliance (A.621) and the *Fraxinus quadrangulata* - (*Juniperus virginiana*) Woodland Alliance (A.1913). *Acer saccharum* - *Quercus muehlenbergii* / *Cercis canadensis* Forest (CEGL006017) is a type with a somewhat overlapping distribution, but is typically found more eastward toward and in the Appalachian region.

**Global Similar Associations:**

*Acer saccharum* - *Quercus muehlenbergii* / *Cercis canadensis* Forest (CEGL006017)

*Quercus imbricaria* - *Quercus shumardii* - *Quercus muehlenbergii* / *Celtis occidentalis* / *Urtica chamaedryoides* Forest (CEGL003876)

*Quercus muehlenbergii* - *Juniperus virginiana* - *Acer saccharum* / *Frangula caroliniana* Forest (CEGL002108)

*Quercus muehlenbergii* - *Quercus shumardii* - *Carya (carolinae-septentrionalis, ovata)* Forest (CEGL007808)

*Quercus muehlenbergii* Woodland [Placeholder] (CEGL003704)

*Quercus stellata* - *Quercus marilandica* - *Carya (glabra, texana)* / *Vaccinium arboreum* Forest (CEGL002075)

**Global Related Concepts:**

*Quercus shumardii* - *Quercus muehlenbergii* / *Juniperus virginiana* - *Viburnum rufidulum* / *Sanicula odorata* - *Bignonia capreolata* Forest (VDNH unpubl. data) ?

IA6j. Interior Calcareous Oak - Hickory Forest (Allard 1990) ?

IA6l. Cedar - Oak - Hackberry Elm Forest (Allard 1990) B

**OTHER COMMENTS**

**Other Comments:**

**ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This association is restricted to the Chickamauga Battlefield.

**Global Range:** This chinquapin oak - mixed oak forest association is found in the inner Central Basin of central Tennessee and related areas of the Interior Low Plateau, such as the northern edge of the Pennyroyal Karst Plain of Kentucky, and Shawnee Hills in Indiana and Illinois, as well as limestone ridges in the Eastern Knobs region, the Palisades of the Inner Bluegrass, and the eastern edge of the Mississippian Plateaus region of Kentucky. In southwestern Virginia (Lee County), this forest covers large areas. It also extends marginally into the southern limestone/dolomite valleys of northwestern Georgia at Chickamauga-Chattanooga National Military Park.

**Nations:** US

**States/Provinces:** AL?, GA, IL, IN, KY, TN, VA:S2?

**USFS Ecoregions:** 222Df:CPP, 222Eb:CC?, 222Ec:CC?, 222Ed:CCC, 222Eh:CCC, 222Ej:CCC, 222En:CCC, 222Fa:CCP, 222Fb:CCC, 231Ce:???

**Federal Lands:** DOD (J. Percy Priest?); NPS (Chickamauga-Chattanooga, Lincoln Birthplace, Stones River); TVA (Columbia)

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.06.

**Local Description Authors:** T. Govus

**Global Description Authors:** M. Pyne, mod. D. Faber-Langendoen and T. Govus

**References:** Allard 1990, Fleming et al. 2001, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, TNC 1995a, VDNH 2003, VDNH unpubl. data

**Interior Plateau Chinquapin Oak - Shumard Oak Forest***Quercus muehlenbergii* - *Quercus shumardii* - *Carya (carolinae-septentrionalis, ovata)* Forest

Chinquapin Oak - Shumard Oak - (Carolina Shagbark Hickory, Shagbark Hickory) Forest

Identifier: CEGL007808

**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 muehlenbergii</i> - ( <i>Acer saccharum</i> ) Forest Alliance (A.1912)
Alliance (English name)	Chinquapin Oak - (Sugar Maple) Forest Alliance
Association	<i>Quercus muehlenbergii</i> - <i>Quercus shumardii</i> - <i>Carya (carolinae-septentrionalis, ovata)</i> Forest
Association (English name)	Chinquapin Oak - Shumard Oak - (Carolina Shagbark Hickory, Shagbark Hickory) Forest
Association (Common name)	Interior Plateau Chinquapin Oak - Shumard Oak Forest
<b>Ecological System(s):</b>	Southern Ridge and Valley / Cumberland Dry Calcareous Forest (CES202.457) Southern Interior Low Plateau Dry-Mesic Oak Forest (CES202.898)

**ELEMENT CONCEPT**

**Global Summary:** This association includes dry-mesic forests dominated by varying proportions of *Quercus muehlenbergii* and *Quercus shumardii*. It occurs in the Interior Low Plateau of Alabama, Kentucky and Tennessee, and also extends into the Ridge and Valley and Cumberland Plateau of Alabama and Georgia, on soils derived from limestones or other basic substrates, on gently rolling to rolling topography or on upper to mid slopes. In addition to the nominal species, the canopy may also contain some mixture of *Acer saccharum*, *Carya glabra*, *Fraxinus americana*, *Fraxinus quadrangulata*, and *Ulmus serotina*. Particularly towards the southern portion of the association's distribution, *Carya carolinae-septentrionalis* joins or replaces *Carya ovata* as the predominant hickory. Subcanopy species include *Quercus stellata*, *Aesculus glabra*, *Gleditsia triacanthos*, *Juniperus virginiana* var. *virginiana*, *Ulmus alata*, *Ulmus americana*, *Ulmus serotina* (to the south), *Ulmus thomasii* (to the north), *Cercis canadensis* var. *canadensis*, *Celtis laevigata* var. *laevigata*, *Ostrya virginiana*, *Fraxinus quadrangulata*, *Prunus mexicana*, and *Juglans nigra*. Shrubs include *Forestiera ligustrina*, *Frangula caroliniana*, *Hypericum frondosum*, *Rhus aromatica* var. *aromatica*, *Sideroxylon lycioides*, *Symphoricarpos orbiculatus*, and *Viburnum rufidulum*. *Bignonia capreolata* is a prominent liana. Other woody vines include *Lonicera sempervirens* and *Parthenocissus quinquefolia*. Herbs, a mixture of submesic and xeric limestone species, include *Fleischmannia incarnata*, *Lithospermum tuberosum*, *Polygonatum biflorum*, *Polymnia canadensis*, *Scutellaria ovata*, *Sedum pulchellum*, *Packera anonyma* (= *Senecio anonymus*), *Tragia cordata*, *Ruellia humilis*, *Ruellia strepens*, *Matelea gonocarpos*, *Arabis laevigata* var. *laevigata*, *Cuphea viscosissima*, *Galium* sp., *Diarrhena americana* (= var. *americana*), *Elymus* sp., *Senna marilandica* (= *Cassia marilandica*), *Chimaphila maculata*, *Salvia urticifolia*, *Tiarella cordifolia*, *Triosteum angustifolium*, *Asplenium platyneuron*, and *Asplenium resiliens*. Examples of this association may grade into *Juniperus virginiana* var. *virginiana* - *Fraxinus quadrangulata* / *Polymnia canadensis* - (*Astranthium integrifolium*) Woodland (CEGL003754), *Quercus alba* - *Quercus rubra* - *Quercus muehlenbergii* / *Cercis canadensis* Forest (CEGL002070), or *Quercus muehlenbergii* - *Quercus (falcata, shumardii, stellata)* / *Cercis canadensis* / *Viburnum rufidulum* Forest (CEGL007699). Most examples observed seem to be generally subxeric. More mesic examples, formerly regarded as a 'mesic variant' of this association, are now accommodated as *Quercus shumardii* - *Quercus muehlenbergii* - *Acer (barbatum, leucoderme, saccharum)* / *Ostrya virginiana* Forest (CEGL008442).

**ENVIRONMENTAL DESCRIPTION****USFWS Wetland System:**

**Chickamauga-Chattanooga National Military Park Environment:** This association occurs on the tops of low knobs in generally rolling topography over dolomites and limestones of the Knox and Chickamauga groups in the portion of the southern limestone/dolomite valley that makes up the Chickamauga Battlefield. These are dry-mesic sites with well-drained soils that are high in calcium. Elevations average around 305 m (1000 feet).

**Global Environment:** This association occurs in the Interior Low Plateau of Alabama, Kentucky and Tennessee, on soils derived from limestones or other basic substrates, on gently rolling topography or on upper to mid slopes.

#### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** The examples of this association that were studied have a varied canopy that always includes substantial amounts of *Quercus muehlenbergii* and *Quercus shumardii* along with *Carya carolinae-septentrionalis*, *Quercus stellata*, *Juniperus virginiana* var. *virginiana*, *Juglans nigra*, *Carya laciniosa*, *Carya ovalis*, and sometimes *Quercus alba*. A few examples also include *Pinus echinata*. Subcanopy and understory species that are common include *Ulmus rubra*, *Celtis tenuifolia*, *Cercis canadensis*, and *Celtis laevigata*. The shrub layer generally is sparse, with *Symphoricarpos orbiculatus*, *Viburnum rufidulum*, *Frangula caroliniana*, and *Rhus aromatica* var. *aromatica* as common species. The herbaceous layer tends to be sparse but diverse with *Salvia urticifolia*, *Ageratina altissima*, *Verbesina virginica*, *Senna marilandica*, *Bromus pubescens*, *Piptochaetium avenaceum*, *Chasmanthium sessiliflorum*, and *Dichantheium boscii*. The non-native introduced shrub *Ligustrum sinense* is also sometimes a component of these forests.

**Global Vegetation:** In addition to *Quercus muehlenbergii* and *Quercus shumardii*, the canopy may also contain some mixture of *Acer saccharum*, *Carya glabra*, *Fraxinus americana*, *Fraxinus quadrangulata*, and *Ulmus serotina*. In some examples, the *Carya* sp. present may be *Carya carolinae-septentrionalis*. Subcanopy species include *Quercus stellata*, *Aesculus glabra*, *Gleditsia triacanthos*, *Juniperus virginiana* var. *virginiana*, *Ulmus alata*, *Ulmus americana*, *Cercis canadensis* var. *canadensis*, *Celtis laevigata* var. *laevigata*, *Fraxinus quadrangulata*, *Prunus mexicana*, and *Juglans nigra*. Shrubs and woody vines include *Bignonia capreolata*, *Forestiera ligustrina*, *Frangula caroliniana*, *Hypericum frondosum*, *Lonicera sempervirens*, *Parthenocissus quinquefolia*, *Rhus aromatica* var. *aromatica*, *Sideroxylon lycioides*, *Symphoricarpos orbiculatus*, and *Viburnum rufidulum*. Herbs, a mixture of submesic and xeric limestone species, include *Fleischmannia incarnata*, *Lithospermum tuberosum*, *Polygonatum biflorum*, *Polymnia canadensis*, *Scutellaria ovata*, *Sedum pulchellum*, *Packera anonyma* (= *Senecio anonymus*), *Tragia cordata*, *Ruellia humilis*, *Ruellia strepens*, *Matelea gonocarpos*, *Arabis laevigata* var. *laevigata*, *Cuphea viscosissima*, *Galium* sp., *Elymus* sp., *Senna marilandica* (= *Cassia marilandica*), *Chimaphila maculata*, *Salvia urticifolia*, *Tiarella cordifolia*, *Triosteum angustifolium*, *Asplenium platyneuron*, and *Asplenium resiliens*. Some additional spring-aspect herbs at Cedars of Lebanon State Park, Tennessee, include *Trillium cuneatum*, *Podophyllum peltatum*, *Cardamine concatenata*, *Cardamine douglassii*, *Claytonia virginica*, and *Ranunculus fascicularis*.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus muehlenbergii</i> , <i>Quercus shumardii</i>
Tree subcanopy	Needle-leaved tree	<i>Juniperus virginiana</i> var. <i>virginiana</i>
Tall shrub/sapling	Broad-leaved deciduous shrub	<i>Frangula caroliniana</i> , <i>Rhus aromatica</i> var. <i>aromatica</i>
Herb (field)	Forb	<i>Salvia urticifolia</i>

##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Bromus pubescens*, *Carya carolinae-septentrionalis*, *Carya laciniosa*, *Carya ovalis*, *Celtis laevigata*, *Celtis tenuifolia*, *Cercis canadensis*, *Frangula caroliniana*, *Juniperus virginiana* var. *virginiana*, *Piptochaetium avenaceum*, *Quercus muehlenbergii*, *Quercus shumardii*, *Quercus stellata*, *Rhus aromatica* var. *aromatica*, *Salvia urticifolia*, *Senna marilandica*, *Verbesina virginica*, *Viburnum rufidulum*

**Global:**

**OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:**

**Global:** *Juglans cinerea*

**CONSERVATION STATUS RANK**

**Global Rank & Reasons:** G3 (30-Sep-2004). This oak-dominated forest association occurs in Alabama, Georgia, Kentucky, and Tennessee, on soils derived from limestones or other basic substrates, on upper to mid slopes. Some examples may be protected on TVA, Army Corps of Engineers, State of Tennessee, The Nature Conservancy, and U.S. Forest Service lands. It is documented from the Nashville Basin of Tennessee, the Ridge and Valley of Georgia, and the Cumberlands of Alabama. Most, if not all, high-quality examples have been eliminated or severely impacted by timber removal, grazing, soil erosion, and fire suppression. Other current threats include windthrow, microclimate modification from intensive silvicultural practices on adjacent uplands, forest type conversion, and herbicide use. In the Nashville Basin development is a threat, especially in Rutherford and Wilson counties, TN.

**CLASSIFICATION**

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** This concept originated with the more xeric manifestation of *Quercus muehlenbergii* - *Quercus shumardii*-dominated vegetation of limestone slopes in Tennessee and Kentucky, in particular the Inner or Outer Nashville Basin of Tennessee (subsections 222Ec and 222Ed). Examples have subsequently been located in the Cumberland Plateau of Alabama. This association should be found on the Somerset Ranger District of the Daniel Boone National Forest (Kentucky), as well as in the Kentucky Palisades and the Dripping Springs Escarpment. Additional information is needed regarding landscape position, variation, and floristics of this association across its range. Forests dominated by these nominal oaks seem to range from xeric to relatively mesic. The more mesic examples, formerly regarded as a "mesic variant" of this association, are now (2000-06) placed in *Quercus shumardii* - *Quercus muehlenbergii* - *Acer (barbatum, leucoderme, saccharum)* / *Ostrya virginiana* Forest (CEGL008442). The relationship of these associations to each other and to their western relative, *Quercus muehlenbergii* - *Quercus shumardii* Forest (CEGL004602), is under investigation. Related vegetation west of the Mississippi River in Arkansas and Oklahoma will be found in *Quercus muehlenbergii* - *Quercus shumardii* Forest (CEGL004602).

**Global Similar Associations:**

*Juniperus virginiana* var. *virginiana* - *Fraxinus quadrangulata* / *Polymnia canadensis* - (*Astranthium integrifolium*) Woodland (CEGL003754)--is a drier limestone woodland.

*Quercus alba* - *Quercus rubra* - *Quercus muehlenbergii* / *Cercis canadensis* Forest (CEGL002070)--is white oak-dominated.

*Quercus alba* - *Quercus stellata* / *Ostrya virginiana* - *Acer barbatum* / *Chasmanthium sessiliflorum* Forest (CEGL008443)

*Quercus imbricaria* - *Quercus shumardii* - *Quercus muehlenbergii* / *Celtis occidentalis* / *Urtica chamaedryoides* Forest (CEGL003876)

*Quercus muehlenbergii* - *Quercus (falcata, shumardii, stellata)* / *Cercis canadensis* / *Viburnum rufidulum* Forest (CEGL007699)--is a related, drier forest.

*Quercus muehlenbergii* - *Quercus shumardii* Forest (CEGL004602)--occurs west of the Mississippi River.

*Quercus shumardii* - *Quercus muehlenbergii* - *Acer (barbatum, leucoderme, saccharum)* / *Ostrya virginiana* Forest (CEGL008442)--is slightly more mesic.

**Global Related Concepts:****OTHER COMMENTS****Other Comments:**

### ELEMENT DISTRIBUTION

**Chickamauga-Chattanooga National Military Park Range:** This association is restricted to the rolling topography of Chickamauga Battlefield.

**Global Range:** This oak-dominated forest association occurs in Alabama, Georgia, Kentucky, and Tennessee; it is documented from the Nashville Basin of Tennessee, the Ridge and Valley of Georgia, and the Cumberlands of Alabama.

**Nations:** US

**States/Provinces:** AL:S2S3, GA, KY, TN

**USFS Ecoregions:** 221Hc:CCC, 222Eb:CC?, 222Ec:CCC, 222Ed:CCC, 222Ee:CCC, 222Ef:CC?, 222Eg:CCP, 222Eh:CCP, 222Fa:CP?, 222Fb:CP?, 222Fc:CP?, 222Fd:CP?, 231Cd:CCC, 231Ce:CCP

**Federal Lands:** DOD (J. Percy Priest?); NPS (Chickamauga-Chattanooga, Natchez Trace, Stones River); TVA (Columbia?); USFS (Bankhead, Daniel Boone)

### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.12, CHCH.13, CHCH.15, CHCH.17.

**Local Description Authors:** T. Govus

**Global Description Authors:** M. Pyne

**References:** Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

### Xeric Ridgetop Chestnut Oak Forest

*Quercus prinus* - (*Quercus coccinea*) / *Carya pallida* / *Vaccinium arboreum* - *Vaccinium pallidum* Forest

Chestnut Oak - (Scarlet Oak) / Sand Hickory / Farkleberry - Hillside Blueberry Forest

Identifier: CEGL008431

### 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 prinus</i> - ( <i>Quercus coccinea</i> , <i>Quercus velutina</i> ) Forest Alliance (A.248)
Alliance (English name)	Chestnut Oak - (Scarlet Oak, Black Oak) Forest Alliance
Association	<i>Quercus prinus</i> - ( <i>Quercus coccinea</i> ) / <i>Carya pallida</i> / <i>Vaccinium arboreum</i> - <i>Vaccinium pallidum</i>
Association (English name)	Forest
Forest	Chestnut Oak - (Scarlet Oak) / Sand Hickory / Farkleberry - Hillside Blueberry Forest
Association (Common name)	Xeric Ridgetop Chestnut Oak Forest

**Ecological System(s):** Southern Appalachian Oak Forest (CES202.886)  
Southern Piedmont Dry Oak-(Pine) Forest (CES202.339)  
Allegheny-Cumberland Dry Oak Forest and Woodland (CES202.359)

### ELEMENT CONCEPT

**Global Summary:** This association includes xeric rock chestnut oak forests on high slopes and ridges in the southern Cumberland Plateau, southern Ridge and Valley, Southern Blue Ridge, and occasionally in the Piedmont of North Carolina, South Carolina, and Georgia. This forest occurs over rocky, shallow soils derived from various geologies. These include sandstone, quartzite (in the Piedmont), schist, or weakly metamorphosed, metasedimentary rocks (in the western edge of the Southern Blue Ridge). This is a closed-canopy, deciduous forest with open to sparse shrub layers and a sparse to absent herb layer. The canopy is dominated by *Quercus prinus*, sometimes sharing dominance with *Quercus coccinea*. Other oaks in the canopy can include *Quercus velutina*, *Quercus stellata*, and *Quercus alba*, although these oaks are not dominant. Hickories (e.g., *Carya glabra*, *Carya pallida*) may be present in the canopy and/or subcanopy. Some examples may have coverage of pine in the canopy, most commonly *Pinus virginiana* and *Pinus echinata*. The most common subcanopy trees are *Acer rubrum*, *Carya pallida*, *Cornus florida*, *Nyssa sylvatica*, and *Oxydendrum arboreum*. The most constant shrub species are *Chimaphila maculata*, *Vaccinium arboreum*, *Vaccinium pallidum*, *Vaccinium stamineum*, *Diospyros virginiana*, and *Sassafras albidum*. Herb coverage is sparse, with little constancy among examples. Some of the more typical herb species are *Euphorbia corollata*, *Hieracium venosum*, *Carex nigromarginata*, and *Solidago odora*, but many other species may occur.

### ENVIRONMENTAL DESCRIPTION

#### USFWS Wetland System:

**Chickamauga-Chattanooga National Military Park Environment:** This association occurs on upper slopes with western exposures just below the sandstone cap of Lookout Mountain and also on the steep sandstone bluff of Moccasin Bend. These are xeric to dry-mesic sites with acidic soils and elevations ranging from 268 to 458 m (880-1500 feet).

**Global Environment:** This forest is found on north- and west-facing high slopes and ridgetops over soils derived from sandstone, in the Cumberland Plateau and Ridge and Valley, or weakly metamorphosed, metasedimentary rocks in the western edge of the Southern Blue Ridge. Examples range from 225 to 732 m (740-2400 feet) elevation, with most examples occurring over 274 m (900 feet) elevation. Examples in the Piedmont are usually over metamorphic rock such as schist or quartzite. In the Blue Ridge, this type does not generally reach elevations above 732 m (2400 feet).

### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** Examples studied have a canopy strongly dominated by *Quercus prinus* with lesser amounts of *Quercus coccinea*, *Quercus velutina*, *Carya pallida*, *Pinus echinata*, and *Pinus taeda*. The subcanopy and understory layers include *Acer rubrum*, *Oxydendrum arboreum*, *Nyssa sylvatica*, *Sassafras albidum*, and *Cornus florida*. The shrub layer is sparse to patchy, with *Vaccinium stamineum*, *Vaccinium pallidum*, *Rhododendron canescens*, *Viburnum acerifolium*, and *Vaccinium corymbosum* being the most frequently encountered species. The herbaceous layer is likewise sparse and generally makes up less than 5% of the ground cover. *Chimaphila maculata*, *Desmodium nudiflorum*, *Coreopsis major*, *Lysimachia ciliata*, and *Solidago curtisii* are some of the most common species. Vines such as *Smilax glauca*, *Parthenocissus quinquefolia*, and *Vitis rotundifolia* are also frequent.

**Global Vegetation:** This is a closed-canopy, deciduous forest with open to sparse shrub layers and a sparse to absent herb layer. The canopy is dominated by *Quercus prinus* sometimes sharing dominance with *Quercus coccinea* (and in some Piedmont examples, with *Quercus coccinea* as the dominant canopy tree). Other oaks in the canopy can include *Quercus velutina*, *Quercus stellata*, and *Quercus alba*, although these oaks are not dominant. Hickories (e.g., *Carya glabra*, *Carya pallida*) may be present in the canopy and/or subcanopy. Some examples may have coverage of pine in the canopy, most commonly *Pinus virginiana* and *Pinus echinata*. The most common subcanopy trees are *Acer rubrum*, *Carya pallida*, *Cornus florida*, *Nyssa sylvatica*, and *Oxydendrum arboreum*. Other minor species in the canopy and subcanopy can include *Carya glabra*, *Castanea dentata*, and *Magnolia macrophylla*. The most constant shrub species are *Chimaphila maculata*, *Vaccinium arboreum*, *Vaccinium pallidum*, *Vaccinium stamineum*, *Diospyros virginiana*, and *Sassafras albidum*. Other shrubs that can occur in examples of this community are *Lyonia ligustrina*, *Castanea pumila*, *Viburnum acerifolium*, *Rhododendron alabamense*, and *Rhododendron canescens*. Herb coverage is sparse, with little constancy among examples. Some of the more typical herb species are *Euphorbia corollata*, *Hieracium venosum*, *Carex nigromarginata*, and *Solidago odora*, but many other species may occur. In the lower Piedmont of Georgia, some additional herbs may include *Schizachyrium*

*scoparium*, *Dichantherium boscii*, *Piptochaetium avenaceum*, *Tephrosia virginiana*, *Verbesina virginica*, *Hypoxis hirsuta*, *Tragia urticifolia*, *Brickellia eupatorioides*, *Scutellaria elliptica*, *Arnoglossum atriplicifolium*, *Pityopsis aspera*, and *Coreopsis major*.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus prinus</i>
Tall shrub/sapling	Broad-leaved deciduous shrub	<i>Vaccinium pallidum</i> , <i>Vaccinium stamineum</i>

##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus coccinea</i> , <i>Quercus prinus</i>
Tree subcanopy	Broad-leaved deciduous tree	<i>Acer rubrum</i>

#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Acer rubrum*, *Carya pallida*, *Chimaphila maculata*, *Desmodium nudiflorum*, *Oxydendrum arboreum*, *Pinus echinata*, *Quercus coccinea*, *Quercus prinus*, *Quercus velutina*, *Rhododendron canescens*, *Vaccinium pallidum*, *Vaccinium stamineum*

**Global:** *Acer rubrum*, *Oxydendrum arboreum*, *Quercus coccinea*, *Quercus prinus*

#### OTHER NOTEWORTHY SPECIES

**Chickamauga-Chattanooga National Military Park:**

**Global:**

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G4G5 (31-Jan-2003). This is a wide-ranging type, found on a variety of substrates in several ecoregions; its threats are limited.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

##### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** This association was defined from examples found in the southern Ridge and Valley of northwestern Georgia, the Cumberland Plateau of northern Alabama, and the western edge of the Southern Blue Ridge in northern Georgia and southeastern Tennessee, where it represents the driest oak forests of this region. This type may be present in the McCreary and Somerset ranger districts of the Daniel Boone National Forest (Kentucky). Stands of *Quercus prinus* along ecoregional transitions may be difficult to classify [see similar associations].

##### Global Similar Associations:

*Quercus (pinus, coccinea) / Kalmia latifolia / (Galax urceolata, Gaultheria procumbens) Forest (CEGL006271)*--is defined for the Southern Blue Ridge. Has dense, less diverse, ericaceous shrub layer and more acid-loving, Blue Ridge species.

*Quercus prinus - Carya spp. - Quercus velutina / Vaccinium arboreum / Iris verna var. smalliana Forest (CEGL007261)*--is defined for the lower Piedmont of Alabama and has Coastal Plain affinities.

*Quercus prinus - Quercus (alba, coccinea, velutina) / Viburnum acerifolium - (Kalmia latifolia) Forest (CEGL005023)*

*Quercus prinus - Quercus alba / Oxydendrum arboreum / Vitis rotundifolia Forest (CEGL006281)*--is defined for the Piedmont and occurs on granite monadnocks.

*Quercus prinus - Quercus marilandica Piedmont Woodland (CEGL003708)*--can often be found in adjacent ridgetop areas of the Piedmont but has a more open canopy and contains *Quercus marilandica*.

*Quercus prinus - Quercus spp. / Vaccinium arboreum - (Kalmia latifolia, Styrax grandifolius) Forest (CEGL007700)*--is a broadly defined type for the Appalachian Plateau and Interior Low Plateau.

**Global Related Concepts:**

Chestnut Oak Forest (Lipps and DeSelm 1969) ?  
 Chestnut Oak Forest (Lipps 1966) ?  
 Chestnut Oak Type (Chapman 1957)

**OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This association is restricted to the sandstone portion of Lookout Mountain and Moccasin Bend.

**Global Range:** This association occurs in the southern Cumberland Plateau and southern Ridge and Valley of Georgia, Tennessee and Alabama, and ranges into the Southern Blue Ridge and Piedmont regions as well. This or related vegetation is reported from the Daniel Boone National Forest of Kentucky; this needs investigation.

**Nations:** US

**States/Provinces:** AL, GA, KY?, SC, TN

**USFS Ecoregions:** 221Hc:CCC, 221He:CCC, 231Aj:CCC, 231Cd:CCC, 231Dc:CCC, M221Dd:CCC

**Federal Lands:** NPS (Big South Fork, Chickamauga-Chattanooga, Kings Mountain, Little River Canyon?, Obed, Russell Cave); USFS (Bankhead, Chattahoochee, Chattahoochee (Piedmont), Chattahoochee (Southern Blue Ridge), Cherokee, Daniel Boone?)

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.24, CHCH.45.

**Local Description Authors:** T. Govus

**Global Description Authors:** mod. R. White

**References:** Chapman 1957, Govus 2002, Lipps 1966, Lipps and DeSelm 1969, NatureServe Ecology - Southeastern U.S. unpubl. data, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

**Interior Low Plateau Chestnut Oak - Mixed Oak Forest**

*Quercus prinus* - *Quercus* spp. / *Vaccinium arboreum* - (*Kalmia latifolia*, *Styrax grandifolius*) Forest

Chestnut Oak - Oak species / Farkleberry (Mountain Laurel, Bigleaf Snowbell) Forest

Identifier: CEGL007700

**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 prinus</i> - <i>Quercus</i> ( <i>alba</i> , <i>falcata</i> , <i>rubra</i> , <i>velutina</i> ) Forest Alliance (A.249)
Alliance (English name)	Chestnut Oak - (White Oak, Southern Red Oak, Northern Red Oak, Black Oak)
Forest Alliance	
Association	<i>Quercus prinus</i> - <i>Quercus</i> spp. / <i>Vaccinium arboreum</i> - ( <i>Kalmia latifolia</i> , <i>Styrax grandifolius</i> ) Forest
Association (English name)	Chestnut Oak - Oak species / Farkleberry (Mountain Laurel, Bigleaf Snowbell)
Forest	

Association (Common name)	Interior Low Plateau Chestnut Oak - Mixed Oak Forest
<b>Ecological System(s):</b>	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest (CES203.483) Southern Interior Low Plateau Dry-Mesic Oak Forest (CES202.898) Allegheny-Cumberland Dry Oak Forest and Woodland (CES202.359)

#### ELEMENT CONCEPT

**Global Summary:** This community occurs over shallow, rocky soils on narrow ridgetops, upper slopes, and midslopes of south- to southwest-facing ridges in the Interior Low Plateau and nearby provinces such as the Southern Cumberlands and adjacent Southern Ridge and Valley. It may also occur in the Upper East Gulf Coastal Plain. This is the dominant forest type found on narrow ridges of the dissected western escarpment of the Eastern Highland Rim of Tennessee at about 350 m (1100 feet) elevation. These forests have canopies which are strongly dominated by *Quercus prinus*, with *Quercus coccinea* and/or *Quercus velutina*, and with lesser amounts of *Quercus rubra*, *Quercus alba*, *Nyssa sylvatica*, *Acer rubrum* var. *rubrum*, and *Carya alba*. The understory may contain *Oxydendrum arboreum*, *Fagus grandifolia*, *Sassafras albidum*, *Aralia spinosa*, and/or *Cornus florida*. The shrub stratum may be dense to sparse, partly dominated by ericaceous species. Typical shrub species can include *Viburnum acerifolium*, *Hypericum frondosum*, *Vaccinium stamineum*, *Vaccinium arboreum*, *Vaccinium pallidum*, *Vaccinium corymbosum*, and *Gaylussacia baccata*. Some examples will contain patches of *Kalmia latifolia*, or *Styrax grandifolius* may replace *Viburnum acerifolium* in some locales. *Smilax glauca* and *Smilax rotundifolia* are typically present. *Castanea dentata* may occur as root sprouts, and decaying stumps may still be evident. Scattered individuals of *Pinus echinata* or *Pinus virginiana* may be present in the subcanopy of some examples. The herb layer is typically sparse and includes subshrubs such as *Epigaea repens* and *Chimaphila maculata*. Other common species may include *Tipularia discolor*, *Antennaria plantaginifolia*, *Cypripedium acaule*, *Danthonia spicata*, *Epigaea repens*, *Helianthus divaricatus*, *Helianthus hirsutus*, *Dichantheium dichotomum* (= *Panicum dichotomum*), and *Polystichum acrostichoides*. Mats of mosses may cover the ground surface where herbaceous cover and leaf litter are sparse.

#### ENVIRONMENTAL DESCRIPTION

##### USFWS Wetland System:

**Chickamauga-Chattanooga National Military Park Environment:** This is a widespread association for the western slopes of Lookout Mountain. Sites range from somewhat xeric to dry-mesic. The geologic substrates vary from Pennsylvanian sandstone on the upper slopes to Mississippian shales and limestone in midslope positions. Elevations vary from 275 to 412 m (900-1350 feet).

**Global Environment:** Stands occur on dry/xeric upper slopes, midslopes and narrow ridgetops. Soils are typically shallow and occur over non-calcareous bedrock of sandstone, conglomerate, or shale, or, to the south, over thin loess and siliceous limestones and cherts.

#### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** Plots studied on Lookout Mountain are dominated by *Quercus prinus* and *Quercus velutina* often in association with *Quercus alba*. Other prominent canopy species include *Quercus rubra*, *Carya ovalis*, *Carya glabra*, and occasionally *Carya pallida*. Scattered individuals of *Pinus echinata* and *Pinus virginiana* are also sometimes present. Subcanopy and understory species frequently encountered include *Oxydendrum arboreum*, *Acer rubrum*, *Carya alba*, *Nyssa sylvatica*, *Sassafras albidum*, and *Cornus florida*. The shrub layer is generally sparse to patchy, with *Vaccinium stamineum*, *Vaccinium pallidum*, *Vaccinium arboreum*, *Kalmia latifolia*, *Viburnum acerifolium*, *Vaccinium corymbosum*, and *Hypericum hypericoides* some of the most characteristic species. In most cases the herbaceous layer is also sparse, but in more mesic situations, such as concave midslopes, it can be moderately well-developed and diverse. Typical species include *Deschampsia flexuosa*, *Danthonia spicata*, *Schizachyrium scoparium*, *Solidago erecta*, *Euphorbia pubentissima*, *Carex nigromarginata*, *Coreopsis major*, *Helianthus microcephalus*, *Doellingeria umbellata*, *Porteranthus stipulatus*, and *Tipularia discolor*.

**Global Vegetation:** These forests have canopies which are strongly dominated by *Quercus prinus*, with *Quercus coccinea* and/or *Quercus velutina*, and with lesser amounts of *Quercus rubra*, *Quercus alba*, *Nyssa sylvatica*, *Acer rubrum* var. *rubrum*, and *Carya alba*. The understory may contain *Oxydendrum arboreum*, *Fagus grandifolia*, *Sassafras albidum*, *Aralia spinosa*, and/or *Cornus florida*. The shrub stratum may be dense to sparse, partly dominated by ericaceous species. Typical shrub species include *Viburnum acerifolium*, *Hypericum frondosum*,

*Vaccinium stamineum*, *Vaccinium pallidum*, *Vaccinium corymbosum*, and *Gaylussacia baccata*. Some examples will contain patches of *Kalmia latifolia*. Some Tennessee stands (e.g., in 222Eg, the Western Highland Rim) are outside of the range of *Viburnum acerifolium*, which is typically replaced by *Styrax grandifolius* in these situations. *Smilax glauca* and *Smilax rotundifolia* are typically present. *Castanea dentata* may occur as root sprouts, and decaying stumps may still be evident. Scattered individuals of *Pinus echinata* or *Pinus virginiana* may be present in the subcanopy of some examples. The herb layer is typically sparse and includes subshrubs such as *Epigaea repens* and *Chimaphila maculata*. Other common species may include *Tipularia discolor*, *Antennaria plantaginifolia*, *Cypripedium acaule*, *Danthonia spicata*, *Epigaea repens*, *Helianthus divaricatus*, *Helianthus hirsutus*, *Dichanthelium dichotomum* (= *Panicum dichotomum*), and *Polystichum acrostichoides*. Mats of mosses may cover the ground surface where herbaceous cover and leaf litter are sparse.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus prinus</i>
Tree subcanopy	Broad-leaved deciduous tree	<i>Oxydendrum arboreum</i>
Tall shrub/sapling	Broad-leaved deciduous shrub	<i>Vaccinium pallidum</i> , <i>Vaccinium stamineum</i>

##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Acer rubrum*, *Coreopsis major*, *Danthonia spicata*, *Deschampsia flexuosa*, *Doellingeria umbellata*, *Euphorbia pubentissima*, *Helianthus microcephalus*, *Kalmia latifolia*, *Oxydendrum arboreum*, *Pinus echinata*, *Porteranthus stipulatus*, *Quercus alba*, *Quercus prinus*, *Quercus velutina*, *Solidago erecta*, *Vaccinium arboreum*, *Vaccinium pallidum*, *Vaccinium stamineum*

##### Global:

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

##### Global:

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G4 (24-Oct-2002). This is a widespread type; *Quercus prinus* replaces itself after canopy removal, seeds germinate in the shade of parent trees, and stands can also replace themselves from stump sprouts. Stands are threatened primarily by conversion to other forest types (e.g., pine plantations) or to other land uses (e.g., pasture, housing development).

#### CLASSIFICATION

**Status:** Standard

##### Classification Confidence:

**Chickamauga-Chattanooga National Military Park Comments:** Documentation of these plots at Lookout Mountain represents a range extension marginally into the Cumberlands and Southern Ridge and Valley.

**Global Comments:** This is at least part of the historic chestnut oak forest after loss of chestnut in the Interior Low Plateau and related ecoregions. More detailed floristic information is needed to reliably distinguish this association from other closely related forests in this alliance, such as *Quercus prinus* - *Carya ovata* - *Quercus rubra* / *Acer saccharum* Forest (CEGL007268) of the Ridge and Valley, *Quercus (pinus, coccinea)* / *Kalmia latifolia* / (*Galax urceolata*, *Gaultheria procumbens*) Forest (CEGL006271) of the Southern Blue Ridge, and the apparently more xeric *Quercus prinus* / *Smilax* spp. Forest (CEGL005022) of the lower Midwest and Kentucky.

##### Global Similar Associations:

*Quercus alba* - *Quercus rubra* - *Carya ovata* Glaciated Forest (CEGL002068)

*Quercus alba* - *Quercus rubra* - *Quercus prinus* - *Acer saccharum* / *Lindera benzoin* Forest (CEGL002059)--

Appalachian oak-maple.

*Quercus prinus* - (*Quercus coccinea*) / *Carya pallida* / *Vaccinium arboreum* - *Vaccinium pallidum* Forest (CEGL008431)

*Quercus prinus* - *Carya ovata* - *Quercus rubra* / *Acer saccharum* Forest (CEGL007268)--of the Ridge and Valley.

*Quercus prinus* - *Quercus* (*alba*, *coccinea*, *velutina*) / *Viburnum acerifolium* - (*Kalmia latifolia*) Forest (CEGL005023)--a related type of the Western Allegheny and related northern ecoregions.

*Quercus prinus* - *Quercus* (*rubra*, *velutina*) / *Vaccinium angustifolium* Forest (CEGL006282)--a more eastern equivalent?

*Quercus prinus* / *Smilax* spp. Forest (CEGL005022)--is perhaps a more xeric type.

**Global Related Concepts:**

Chestnut Oak, HR (Pyne 1994) B

IA6d. Chestnut Oak Slope and Ridge Forest (Allard 1990) ?

**OTHER COMMENTS**

**Other Comments:**

**ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This association is restricted to the upper and mid-slopes of Lookout Mountain.

**Global Range:** This chestnut oak - mixed oak forest community ranges in the United States from the Cumberland / Southern Ridge and Valley, and Interior Low Plateau of Kentucky, Tennessee, Georgia and Alabama (and possibly into the Upper East Gulf Coastal Plain of Mississippi).

**Nations:** US

**States/Provinces:** AL?, GA, KY, MS?, TN

**USFS Ecoregions:** 221Hc:CCC, 221Hd:CCP, 221He:CCP, 222Cc:CPP, 222Ce:CPP, 222Cf:CPP, 222Cg:CPP, 222Eb:CCC, 222Eg:CCC, 222Eo:CCC, 222Fd:CCC, 231Be:PPP

**Federal Lands:** NPS (Chickamauga-Chattanooga, Mammoth Cave, Natchez Trace, Obed); USFS (Daniel Boone, Holly Springs?, Land Between the Lakes?)

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH. 27, CHCH. 28, CHCH. 29, CHCH. 32, CHCH. 34.

**Local Description Authors:** T. Govus

**Global Description Authors:** M. Pyne, mod. T. Govus

**References:** Allard 1990, Evans 1991, Pyne 1994, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

**Dry-Mesic Southern Appalachian White Oak - Hickory Forest**

*Quercus alba* - *Quercus velutina* - *Carya* (*ovata*, *alba*, *glabra*) - *Pinus* sp. Forest

White Oak - Black Oak (Shagbark Hickory, Mockernut Hickory, Pignut Hickory) - Pine species Forest

Identifier: CEGL007231

**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 velutina</i> - <i>Quercus alba</i> - ( <i>Quercus coccinea</i> ) Forest Alliance (A.1911)
Alliance (English name)	Black Oak - White Oak - (Scarlet Oak) Forest Alliance
Association	<i>Quercus alba</i> - <i>Quercus velutina</i> - <i>Carya (ovata, alba, glabra)</i> - <i>Pinus</i> sp. Forest
Association (English name)	White Oak - Black Oak (Shagbark Hickory, Mockernut Hickory, Pignut Hickory)
- Pine species	Forest
Association (Common name)	Dry-Mesic Southern Appalachian White Oak - Hickory Forest
<b>Ecological System(s):</b>	Allegheny-Cumberland Dry Oak Forest and Woodland (CES202.359)

### ELEMENT CONCEPT

**Global Summary:** This dry-mesic upland forest of the southern Appalachians and Cumberland Plateau/Southern Ridge and Valley is dominated by *Quercus alba*, *Quercus velutina*, and several *Carya* spp. (*Carya ovata*, *Carya alba*, *Carya glabra*, *Carya pallida*) and contains a variable amount of *Pinus virginiana* or *Pinus taeda*. *Liquidambar styraciflua* can also be important in some examples. Several other *Quercus* spp. may be present in the canopy (*Quercus falcata*, *Quercus stellata*, *Quercus velutina*, *Quercus coccinea*, *Quercus muehlenbergii*, and *Quercus rubra*). The understory contains *Acer rubrum* and *Oxydendrum arboreum*. In the Ridge and Valley of northeastern Monroe County, Tennessee, this type occurs as disturbed stands with sparse shrub and herb strata. At Chickamauga-Chattanooga National Military Park, this association occurs in sheltered locations on a sandstone ridge that forms the structural spine of Moccasin Bend.

### ENVIRONMENTAL DESCRIPTION

#### USFWS Wetland System:

**Chickamauga-Chattanooga National Military Park Environment:** This association occurs on sandy loam soils associated with the sandstone ridge (of about 50 m [150 feet] in elevational relief) that causes the large bend in the Tennessee River known as Moccasin Bend. It is located on lower slopes and slightly sheltered. The presence of *Liquidambar styraciflua* and *Pinus taeda* are indicative of disturbance, however, these are mature stands with very large individual trees. The elevation of the example studied is 214 m (700 feet). This association was also observed in similar topographic settings at Chickamauga Battlefield occurring on the sandstone cap that covers the northwest portion of the battlefield.

**Global Environment:** In the Tellico study area, this forest generally occurs on southerly slopes with elevation between 250 and 305 m (820-1000 feet). Topographical position ranges from low slope to high slope. Slopes range from gentle to very steep (0-40+ degrees). Unlike *Quercus alba* - *Quercus rubra* communities, these stands are uncommon on the highly dissected knobs. In the remainder of the study area, however, they are common. The dry-mesic nature of these stands probably results from a combination of southerly aspect and dry soil conditions. These communities are associated with a wide variety of soils. Many stands are underlain by soils derived in residuum from calcareous shale and calcareous sandstone of the Middle Ordovician. These soils are slightly to very acidic and well-drained. Soil series of this type are Dandridge (Lithic Ruptic-Alfic Eutrochrepts), Tellico (Typic Rhododults), and Steekee (Ruptic-Ultic Dystrochrepts). These soils are slightly to very acidic and well-drained to very well-drained. Average depth of solum ranges from 43 cm (17 inches) (Dandridge series) to 147 cm (58 inches) (Tellico series). Other soils associated with these stands include Typic Hapludults weather from limestone (Bland series) and Paleudults on terraces and foot slopes formed from colluvium and alluvium (Etowah).

### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** This forest type is dominated by *Quercus velutina*, *Quercus alba*, and several *Carya* spp. (*Carya alba*, *Carya ovalis*, *Carya pallida*). It also contains a variable amount of *Pinus taeda* and *Liquidambar styraciflua*. Other *Quercus* spp. may be present in the canopy (*Quercus falcata*, *Quercus stellata*, *Quercus coccinea*, and *Quercus rubra*). The understory contains *Acer rubrum* and *Oxydendrum arboreum*. The shrub layer is very open and includes only transgressive hardwood species from the canopy or understory. The herbaceous layer is also sparsely developed with only a few species. *Asplenium platyneuron*, *Polystichum acrostichoides*, and *Aristolochia serpentaria* are the most frequent of these. Coverage by vine species, including *Vitis rotundifolia*, *Smilax rotundifolia*, *Parthenocissus quinquefolia*, and *Toxicodendron radicans*, is very high.

**Global Vegetation:** Stands of this upland forest are dominated by *Quercus alba*, *Quercus velutina*, and several *Carya* spp. (*Carya ovata*, *Carya alba*, *Carya glabra*, *Carya pallida*) and can contain a variable amount of *Pinus virginiana* or *Pinus taeda*. Several other *Quercus* spp. may be present in the canopy (*Quercus falcata*, *Quercus*

*stellata*, and *Quercus coccinea*). *Liquidambar styraciflua* can also be important in some examples. In addition, *Pinus strobus* may comprise a small part of the canopy (in the Tellico examples). The canopy is generally closed (>75% cover) with gaps resulting from natural disturbance (i.e., mudslides, fire). Other frequently occurring species but in low percent coverage are *Liriodendron tulipifera*, *Carya alba*, *Quercus stellata*, *Carya glabra*, *Quercus coccinea*, *Acer saccharum*, *Fraxinus americana*, and *Pinus echinata*. Other canopy species do occur, but less frequently. The subcanopy has a percent cover of less than 40%. Frequently occurring subcanopy species may include *Quercus alba*, *Oxydendrum arboreum*, *Cornus florida*, *Fraxinus americana*, and *Carya glabra*. The shrub and herbaceous layers are sparse. The shrub layer will contain small stems of the canopy and subcanopy species and may contain shrubs such as *Vaccinium arboreum* and *Frangula caroliniana*. Other species that may be found in the herbaceous layer are *Rosa* sp., *Rubus* sp., *Verbena occidentalis*, *Aureolaria virginica*, *Chimaphila maculata*, *Desmodium* sp., *Pleopeltis polypodioides* ssp. *polypodioides*, *Polystichum acrostichoides*, and *Rudbeckia hirta*.

### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus alba</i> , <i>Quercus velutina</i>
Shrub/sapling (tall & short)	Vine/Liana	<i>Smilax rotundifolia</i> , <i>Toxicodendron radicans</i> , <i>Vitis rotundifolia</i>

#### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree (canopy & subcanopy)	Broad-leaved deciduous tree	<i>Carya ovata</i>
Tree canopy	Needle-leaved tree	<i>Pinus virginiana</i>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus alba</i> , <i>Quercus falcata</i>
Tree subcanopy	Needle-leaved tree	<i>Juniperus virginiana</i>
Tree subcanopy	Broad-leaved deciduous tree	<i>Acer saccharum</i> , <i>Cornus florida</i>
Shrub/sapling (tall & short)	Needle-leaved tree	<i>Juniperus virginiana</i>
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Acer saccharum</i> , <i>Cornus florida</i>
Shrub/sapling (tall & short)	Vine/Liana	<i>Lonicera japonica</i> , <i>Parthenocissus quinquefolia</i> , <i>Toxicodendron radicans</i>
Short shrub/sapling	Broad-leaved deciduous shrub	<i>Carya ovata</i> , <i>Fraxinus americana</i>

### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Acer rubrum*, *Aristolochia serpentaria*, *Carya alba*, *Carya ovalis*, *Carya pallida*, *Parthenocissus quinquefolia*, *Pinus taeda*, *Polystichum acrostichoides*, *Quercus alba*, *Quercus velutina*, *Smilax rotundifolia*, *Toxicodendron radicans*, *Vitis rotundifolia*

**Global:** *Juniperus virginiana*, *Pinus virginiana*, *Quercus coccinea*, *Quercus falcata*, *Quercus stellata*, *Quercus velutina*

### OTHER NOTEWORTHY SPECIES

#### Chickamauga-Chattanooga National Military Park:

**Global:**

### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G4G5 (14-Aug-1997).

### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:** Examples studied here represent the first reliable documentation of this type since it was described from the Tellico Project (1994-1995).

**Global Comments:** Described from Tellico Pilot Project (Ridge and Valley, northeastern Monroe County, Tennessee; 33 stands sampled), where this type occurs as disturbed stands with sparse shrub and herb strata (Andreu and Tukman 1995). *Pinus virginiana* is included in the name as a placeholder to indicate the relative xeric nature of

this forest until more information is available to define understory indicator species. This may be similar to dry shale forests of Virginia's Ridge and Valley (G. Fleming pers. comm.).

**Global Similar Associations:**

*Quercus alba* - (*Quercus rubra*, *Acer saccharum*, *Fagus grandifolia*) / *Aesculus flava* Forest (CEGL007233)

*Quercus alba* - *Quercus rubra* - *Carya ovata* / *Cercis canadensis* - *Juniperus virginiana* var. *virginiana* Forest (CEGL007240)

**Global Related Concepts:**

IA6i. Interior Upland Dry-Mesic Oak - Hickory Forest (Allard 1990) B

Mixed Oak - Hickory Forest (Ambrose 1990a) B

Oak - Hickory Forest (Oberholster 1993) B

White Oak - Northern Red Oak, RV (Pyne 1994) B

White Oak: 53 (Eyre 1980) B

**OTHER COMMENTS**

**Other Comments:**

**ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This association has been documented at Moccasin Bend in Tennessee and observed on the sandstone portion of Chickamauga Battlefield.

**Global Range:** This community occurs in the Southern Ridge and Valley and Cumberland Plateau province of Tennessee and may occur in Georgia, South Carolina, North Carolina, Alabama and Virginia, as well.

**Nations:** US

**States/Provinces:** AL?, GA, KY?, NC?, SC?, TN, VA?

**USFS Ecoregions:** 221Ja:CCC, 221Jb:CCC

**Federal Lands:** NPS (Chickamauga-Chattanooga); TVA (Tellico); USFS (Cherokee?)

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.47.

**Local Description Authors:** T. Govus

**Global Description Authors:** M. Andreu and M. Tukman, mod. M. Pyne and T. Govus

**References:** Allard 1990, Ambrose 1990a, Andreu and Tukman 1995, Eyre 1980, Fleming pers. comm., Nelson 1986, Oberholster 1993, Pyne 1994, Schafale and Weakley 1990, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

**Calcareous Black Locust Successional Forest**

*Robinia pseudoacacia* - *Celtis occidentalis* - (*Fraxinus americana*, *Liriodendron tulipifera*) Forest

Black Locust - Common Hackberry - (White Ash, Tuliptree) Forest

Identifier: CEGL007281

**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>Robinia pseudoacacia</i> Forest Alliance (A.256)

Alliance (English name)	Black Locust Forest Alliance
Association	<i>Robinia pseudoacacia</i> - <i>Celtis occidentalis</i> - ( <i>Fraxinus americana</i> , <i>Liriodendron tulipifera</i> ) Forest
Association (English name)	Black Locust - Common Hackberry - (White Ash, Tuliptree) Forest
Association (Common name)	Calcareous Black Locust Successional Forest
<b>Ecological System(s):</b>	Southern Ridge and Valley / Cumberland Dry Calcareous Forest (CES202.457)

#### ELEMENT CONCEPT

**Global Summary:** A dry-mesic to mesic successional slope forest of the Ridge and Valley, with *Robinia pseudoacacia* (up to 50%) and *Celtis occidentalis* (5-50%) making up most of the total canopy cover; *Fraxinus americana* or *Liriodendron tulipifera* may contribute 1-75% of the total canopy cover. Other common canopy species are *Acer saccharum* and *Ulmus rubra*. The subcanopy is typically dominated by *Acer saccharum* and *Asimina triloba*. This differs from the *Robinia pseudoacacia* Forest (CEGL007279) in having a more mixed canopy, in occurring over calcareous substrates, and in having calciphilic species. This successional forest is found on calcareous shale ridges and knobs, and at least some stands are thought to have resulted from clearcutting.

#### ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:**

**Chickamauga-Chattanooga National Military Park Environment:**

**Global Environment:**

#### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:**

**Global Vegetation:** Stands of this successional forest are dominated by *Robinia pseudoacacia* (up to 50%) and *Celtis occidentalis* (5-50%), which make up most of the total canopy cover. In addition, *Fraxinus americana* or *Liriodendron tulipifera* may contribute 1-75% of the total canopy cover. Other common canopy species are *Acer saccharum* and *Ulmus rubra*. The subcanopy is typically dominated by *Acer saccharum* and *Asimina triloba*.

#### MOST ABUNDANT SPECIES

**Chickamauga-Chattanooga National Military Park**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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**Global**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:**

**Global:**

#### OTHER NOTEWORTHY SPECIES

**Chickamauga-Chattanooga National Military Park:**

**Global:**

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** GNA (ruderal) (14-May-2001). Examples of this association are successional forests composed of species native to North America. Rank changed from GW to GD 2001-05-14.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** This association is described from Tellico Pilot Project (Ridge and Valley of Tennessee, northeastern Monroe County; 43 stands sampled), where this successional forest is found on calcareous shale ridges and knobs, and at least some stands are thought to have resulted from clearcutting (Andreu and Tukman 1995).

**Global Similar Associations:**

*Celtis (laevigata, occidentalis) - Juglans nigra - (Aesculus glabra)* Forest (CEGL004697)--of central Tennessee.  
*Juglans nigra - Celtis occidentalis* Forest (CEGL004693)--of Interior Low Plateau Kentucky.  
*Robinia pseudoacacia* Forest (CEGL007279)

**Global Related Concepts:**

**OTHER COMMENTS**

**Other Comments:**

**ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:**

**Global Range:** This forest occurs in the Ridge and Valley physiographic province of the southeastern United States, and possibly in the adjacent Southern Blue Ridge.

**Nations:** US

**States/Provinces:** TN, VA

**USFS Ecoregions:** 221J:CC

**Federal Lands:** NPS (Chickamauga-Chattanooga?); TVA (Tellico); USFS (Cherokee?)

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:**

**Local Description Authors:**

**Global Description Authors:** M. Andreu and M. Tukman

**References:** Andreu and Tukman 1995, Southeastern Ecology Working Group n.d., TDNH unpubl. data

**Box-elder Floodplain Forest**

*Acer negundo* Forest

Box-elder Forest

Identifier: CEGL005033

**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>Acer negundo</i> Temporarily Flooded Forest Alliance (A.278)
Alliance (English name)	Box-elder Temporarily Flooded Forest Alliance
Association	<i>Acer negundo</i> Forest
Association (English name)	Box-elder Forest
Association (Common name)	Box-elder Floodplain Forest

**Ecological System(s):**

Central Appalachian Floodplain (CES202.608)  
 East Gulf Coastal Plain Large River Floodplain Forest (CES203.489)

Mississippi River Riparian Forest (CES203.190)  
 South-Central Interior Large Floodplain (CES202.705)  
 Atlantic Coastal Plain Large River Floodplain Forest (CES203.066)

### ELEMENT CONCEPT

**Global Summary:** This semi-open to closed-canopy forest is found on floodplains in the southern, eastern, and midwestern United States. Stands occur on large rivers in the active floodplain and on sandbars, and may form farther from the riverfront following disturbance. Occurrences are mostly on higher floodplain terraces with less rocky soils which were used for agriculture or habitation. They are typically temporarily flooded in the spring. These early-successional forests are dominated by *Acer negundo*. Other characteristic species include *Platanus occidentalis*, *Celtis laevigata*, *Acer rubrum*, *Liriodendron tulipifera*, *Robinia pseudoacacia*, *Liquidambar styraciflua*, *Acer saccharinum*, *Ulmus alata*, *Ulmus rubra*, *Carpinus caroliniana*, *Morus rubra*, and *Populus deltoides*. The shrub and herb layers range from sparse to relatively lush, and the vine component often is heavy.

### ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:** Palustrine

**Chickamauga-Chattanooga National Military Park Environment:** This association is located at Moccasin Bend on the historic floodplain of the Tennessee River which has been altered by the deposition of fill dirt (clay) from construction activities. As such this is a successional example of this forest type. The hydrology now is seasonal inundation by rain, primarily in the winter, on these poorly drained soils. The elevation is approximately 200 m (660 feet).

**Global Environment:** Stands occur on large rivers in the active floodplain and on sandbars, and may form farther from the riverfront following disturbance. Occurrences are mostly on higher floodplain terraces with less rocky soils which were used for agriculture or habitation. They are typically temporarily flooded in the spring and have sandy soils. In Kentucky, these forests may also occur in old fields.

### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** The example of this association at Chickamauga-Chattanooga National Military Park is strongly dominated by *Acer negundo* along with lesser amounts of *Celtis laevigata* and *Acer rubrum*. Subcanopy and shrub species identified include *Ulmus americana*, *Quercus phellos*, *Quercus nigra*, and the non-native invasive *Ligustrum sinense*. The herbaceous layer is also dominated by a non-native, *Microstegium vimineum*. Other herbaceous species found here include *Boehmeria cylindrica*, *Polygonum caespitosum* var. *longisetum*, *Passiflora incarnata*, and *Toxicodendron radicans*.

**Global Vegetation:** These early-successional forests (sometimes woodlands) are dominated by *Acer negundo*. Other characteristic species include *Platanus occidentalis*, *Celtis laevigata*, *Acer rubrum*, *Liriodendron tulipifera*, *Robinia pseudoacacia*, *Liquidambar styraciflua*, *Acer saccharinum*, *Ulmus alata*, *Ulmus rubra*, *Carpinus caroliniana*, *Morus rubra*, and *Populus deltoides*. The shrub and herb layers range from sparse to relatively lush, and the vine component often is heavy. *Lindera benzoin* may be dominant in the shrub layer. The herb layer consists of a mixture of weedy exotics and native floodplain species, including *Ageratina altissima*, *Boehmeria cylindrica*, *Carex grayi*, *Glechoma hederacea*, *Lysimachia nummularia*, *Mertensia virginica*, *Prunella vulgaris*, and *Verbesina alternifolia*. The range, dynamics, and variability of this type are complicated by the "weedy" nature of *Acer negundo*, e.g., in Kentucky, *Acer negundo* may be dominant in old fields, with *Dichanthelium clandestinum* and *Carex* spp. in the ground layer. Elsewhere in the Midwest, logged and grazed stands of *Fraxinus pennsylvanica* and *Ulmus americana* may be dominated by *Acer negundo*.

### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Acer negundo</i>
Tall shrub/sapling	Broad-leaved deciduous shrub	<i>Ligustrum sinense</i>

#### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree (canopy & subcanopy)	Broad-leaved deciduous tree	<i>Acer negundo</i>

### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Acer negundo*, *Acer rubrum*, *Boehmeria cylindrica*, *Celtis laevigata*, *Polygonum caespitosum* var. *longisetum*, *Quercus phellos*, *Ulmus americana*

**Global:** *Acer negundo*, *Acer saccharinum*, *Ageratina altissima*, *Boehmeria cylindrica*, *Carex grayi*, *Lindera benzoin*, *Liquidambar styraciflua*, *Mertensia virginica*, *Platanus occidentalis*, *Prunella vulgaris*, *Robinia pseudoacacia*, *Ulmus americana*, *Verbena alternifolia*

### OTHER NOTEWORTHY SPECIES

**Chickamauga-Chattanooga National Military Park:**

**Global:**

### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G4G5 (28-Mar-2003). As currently defined, this is a broad-ranging community type. However, the range, dynamics, and variability of this type are complicated by the "weedy" nature of *Acer negundo*. More information may be needed to clarify the extent to which this type represents purely natural vegetation. Some stands may develop following disturbance of other natural bottomland communities.

### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** The range, dynamics, and variability of this type is complicated by the 'weedy' nature of *Acer negundo*. For example, disturbed stands in the *Fraxinus pennsylvanica* - *Ulmus americana* - *Celtis (occidentalis, laevigata)* Temporarily Flooded Forest Alliance (A.286) often become dominated by *Acer negundo*. And in the upper Midwest *Acer negundo*-dominated stands are treated as part of the *Fraxinus pennsylvanica* - (*Ulmus americana*) / *Symphoricarpos occidentalis* Forest (CEGL002088). Thus, some consistency is needed in the application of this type across its range. In Arkansas, these forests can be pure *Acer negundo* or have *Acer rubrum* and *Platanus occidentalis* as associates (T. Foti pers. comm. 1999). Composition is variable. This type occurs along the Arkansas River in Arkansas (D. Zollner pers. comm. 1999). In Missouri, stands would probably be combined with *Betula nigra* - *Platanus occidentalis* Forest (CEGL002086) (M. Leahy pers. comm. 1999). In Kentucky, this may be found at the Licking River impoundment (Cave Run Lake). Narrower floodplains of smaller rivers and streams are not included in this association but are treated instead under *Acer negundo* - (*Platanus occidentalis, Populus deltoides*) Forest (CEGL004690).

**Global Similar Associations:**

*Acer negundo* - (*Platanus occidentalis, Populus deltoides*) Forest (CEGL004690)

*Betula nigra* - *Platanus occidentalis* Forest (CEGL002086)

*Fraxinus pennsylvanica* - (*Ulmus americana*) / *Symphoricarpos occidentalis* Forest (CEGL002088)

*Fraxinus pennsylvanica* - *Ulmus americana* - (*Acer negundo, Tilia americana*) Northern Forest (CEGL002089)

*Fraxinus pennsylvanica* - *Ulmus* spp. - *Celtis occidentalis* Forest (CEGL002014)

**Global Related Concepts:**

*Acer negundo* riparian woodland (Vanderhorst 2001b) =

### OTHER COMMENTS

**Other Comments:**

### ELEMENT DISTRIBUTION

**Chickamauga-Chattanooga National Military Park Range:** This association is restricted to Moccasin Bend on the floodplain of the Tennessee River.

**Global Range:** This *Acer negundo* floodplain forest is found sporadically on floodplains in the southern, eastern, and midwestern United States, ranging from Maryland west to Iowa (and possibly southeastern South Dakota), south

to Louisiana and possibly Texas, and east to Georgia. It occurs in the Piedmont region in Pennsylvania and in the Coastal Plain and Piedmont regions in New Jersey and Delaware.

**Nations:** US

**States/Provinces:** AL, AR, DE, GA, IA, KY, LA, MD, MO, MS, NJ, OK, PA, SC, SD?, TN, TX?, VA, WV

**USFS Ecoregions:** 221Ha:CC?, 221Hc:CC?, 221Hd:CC?, 221He:CC?, 221Ja:CP?, 221Jb:CP?, 221Jc:CP?, 222Ca:CC?, 222Cb:CC?, 222Cd:CC?, 222Ce:CC?, 222Cf:CC?, 222Cg:CCC, 222Ch:CC?, 222Ea:CCP, 222Eb:CCP, 222Ec:CCP, 222Ed:CCP, 222Ee:CCP, 222Ef:CCP, 222Eg:CCP, 222Eh:CCP, 222Ei:CCP, 222Ej:CCP, 222Ek:CCP, 222En:CCP, 222Eo:CCC, 222Fa:CP?, 222Fb:CP?, 222Fc:CP?, 222Fd:CP?, 222Ff:CP?, 231Ba:CCP, 231Bb:CCP, 231Bc:CCP, 231Bd:CCP, 231Be:CCP, 231Bf:CCP, 231Bg:CCP, 231Bh:CCC, 231Bi:CCP, 231Bj:CCP, 231Bk:CCP, 231Bl:CCP, 231Ca:CCP, 231Cb:CCP, 231Cc:CCP, 231Cd:CCC, 231Ce:CCP, 231Cf:CCP, 231Cg:CCP, 231Da:CCP, 231Db:CCP, 231Dc:CCP, 231Dd:CCP, 231De:CCP, 231Ea:CC?, 231Eb:CCP, 231Ec:CC?, 231Ed:CCP, 231Ee:CCP, 231Ef:CCP, 231Eg:CCP, 231Eh:CCP, 231Ei:CCP, 231Ej:CCP, 231Ek:CCP, 231El:CCP, 231Em:CCP, 231En:CCP, 231Fa:C??, 231Fb:C??, 231Ga:CCC, 231Gb:CCC, 231Gc:CCC, 232Ac:CCC, 234Aa:CCC, 234Ab:CCC, 234Ac:CCC, 234Ad:CCC, 234Ae:CCC, 234Af:CCC, 234Ag:CCC, 234Ah:CCC, 234Ai:CCC, 234Aj:CCC, 234Ak:CCC, 234Al:CCC, 234Am:CCC, 234An:CCC, M221Cb:CCC

**Federal Lands:** NPS (Chickamauga-Chattanooga, Mammoth Cave, Natchez Trace, New River Gorge, Ozark, Shiloh, Vicksburg); USFS (Daniel Boone, St. Francis); USFWS (Little River)

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.43.

**Local Description Authors:** T. Govus

**Global Description Authors:** mod. E. Largay and S.C. Gawler

**References:** Blair 1938, Campbell pers. comm., Fleming et al. 2001, Foti pers. comm., Harrison 2004, Hoagland 2000, INAI unpubl. data, Leahy pers. comm., Patterson and DeSelm 1989, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, Vanderhorst 2001b, Vanderhorst 2007, Zollner pers. comm.

### Successional Sweetgum Floodplain Forest

*Liquidambar styraciflua* - (*Liriodendron tulipifera*) Temporarily Flooded Forest

Sweetgum - (Tuliptree) Temporarily Flooded Forest

Identifier: CEGL007330

### 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 (English name)	Alliance (A.287)
Association	Sweetgum - (Tuliptree, Red Maple) Temporarily Flooded Forest Alliance
Association (English name)	<i>Liquidambar styraciflua</i> - ( <i>Liriodendron tulipifera</i> ) Temporarily Flooded Forest
Association (Common name)	Sweetgum - (Tuliptree) Temporarily Flooded Forest
	Successional Sweetgum Floodplain Forest

**Ecological System(s):** Atlantic Coastal Plain Small Brownwater River Floodplain Forest (CES203.250)  
East Gulf Coastal Plain Large River Floodplain Forest (CES203.489)  
East Gulf Coastal Plain Small Stream and River Floodplain Forest (CES203.559)  
Southern Piedmont Small Floodplain and Riparian Forest (CES202.323)

## South-Central Interior Small Stream and Riparian (CES202.706)

**ELEMENT CONCEPT**

**Global Summary:** This widespread association of the southeastern United States is dominated by *Liquidambar styraciflua*, but can be dominated by *Liriodendron tulipifera* in some cases, and occurs on heavily disturbed sites such as wetland old fields that have been recovering for the past 10-60 years. This is a successional community that develops following clearcutting or other disturbance along floodplains of major creeks and other temporarily flooded areas. As this community ages, it often begins to approach the composition of more natural *Liquidambar styraciflua* - *Liriodendron tulipifera* / *Lindera benzoin* / *Arisaema triphyllum* ssp. *triphyllum* Forest (CEGL004418). This association is known from the Piedmont, Interior Low Plateau, Inner South Atlantic Coastal Plain, Upper East Gulf Coastal Plain, and possibly other provinces. *Acer rubrum* may be a major component of the canopy and subcanopy and may even partially dominate in some instances. In more mature examples, other canopy/subcanopy species which may occur to a lesser extent and often as scattered emergents are *Quercus alba*, *Quercus phellos*, *Quercus nigra*, *Nyssa sylvatica*, and *Cornus florida*. Stands in the Inner Coastal Plain of South Carolina typically contain *Persea palustris* and *Magnolia virginiana*. The shrub layer can contain *Carpinus caroliniana*, *Itea virginica*, *Vitis rotundifolia*, *Parthenocissus quinquefolia*, *Smilax rotundifolia*, and/or *Rubus* sp., in addition to canopy/subcanopy species. *Lonicera japonica* is often abundant in the understory. On disturbed sites, the shrub layer is often dominated by *Ligustrum sinense*, and the ground layer is typically solid *Microstegium vimineum* or a tangle of *Smilax rotundifolia* and *Rubus* sp. The herbaceous layer may include *Chasmanthium laxum*, *Carex* spp., *Boehmeria cylindrica*, and *Botrychium biternatum*, sometimes growing on hummocks in standing water.

**ENVIRONMENTAL DESCRIPTION**

**USFWS Wetland System:** Palustrine

**Chickamauga-Chattanooga National Military Park Environment:**

**Global Environment:** This association occurs on disturbed sites such as wetland old fields. This is a successional community that develops following clearcutting or other disturbance along floodplains of major creeks and other temporarily flooded areas. These are productive stream terraces subject to occasional flooding (Jones et al. 1981b).

**VEGETATION DESCRIPTION****Chickamauga-Chattanooga National Military Park Vegetation:**

**Global Vegetation:** The canopy of this association is dominated by *Liquidambar styraciflua* but can be dominated by *Liriodendron tulipifera* in some cases. *Acer rubrum* may be a major component of the canopy and subcanopy and may even partially dominate in some instances (TNC 1998a). In more mature examples, other canopy/subcanopy species which may occur to a lesser extent and often as scattered emergents are *Quercus alba*, *Quercus phellos*, *Quercus nigra*, *Fraxinus americana*, *Carya* spp., *Nyssa sylvatica*, and *Cornus florida*. Stands in the Inner Coastal Plain of South Carolina typically contain *Persea palustris* and *Magnolia virginiana* (Jones et al. 1981b). The shrub layer contains *Carpinus caroliniana*, *Itea virginica*, *Vitis rotundifolia*, *Parthenocissus quinquefolia*, *Smilax rotundifolia*, and *Rubus* sp., in addition to canopy/subcanopy species. *Lonicera japonica* is often abundant in the understory. On disturbed sites, the shrub layer is often dominated by *Ligustrum sinense*, and the ground layer is typically solid *Microstegium vimineum* or a tangle of *Smilax rotundifolia* and *Rubus* sp. The herbaceous layer may include *Chasmanthium laxum*, *Carex* spp., *Boehmeria cylindrica*, and *Botrychium biternatum*, sometimes growing on hummocks in standing water. Various *Carex* species may be present.

**MOST ABUNDANT SPECIES****Chickamauga-Chattanooga National Military Park**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
<b>Global</b>		
<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Liquidambar styraciflua</i>

**CHARACTERISTIC SPECIES****Chickamauga-Chattanooga National Military Park:**

**Global:**

**OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:****Global:****CONSERVATION STATUS RANK**

**Global Rank & Reasons:** GNA (ruderal) (8-Aug-2000). This is a successional community which develops following clearcutting or other disturbance along floodplains of major creeks and other temporarily flooded areas.

**CLASSIFICATION**

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** At Arnold Air Force Base (Tennessee), this community is found primarily in the vicinity of Hunt Creek, Heron Pond, and Sinking Pond in areas that have experienced logging. Prior to logging, these areas would probably have had canopies dominated by *Quercus phellos* or *Quercus alba*, with the overall community structure being that of *Quercus alba* - *Carya (alba, ovata)* - *Liriodendron tulipifera* - (*Quercus phellos*) / *Cornus florida* Forest (CEGL007709) or possibly *Quercus phellos* - *Quercus alba* / *Vaccinium fuscatum* - (*Viburnum nudum*) / *Carex (barrattii, intumescens)* Forest (CEGL007364). The sweet gum-red maple-red bay community of Jones et al. 1981b (2 stands sampled) is included here.

**Global Similar Associations:**

*Liquidambar styraciflua* - *Liriodendron tulipifera* / *Lindera benzoin* / *Arisaema triphyllum* ssp. *triphyllum* Forest (CEGL004418)--may be difficult to distinguish from older versions of this community; trees will be older, uneven-aged, and the herbaceous layer more diverse in this association.

*Quercus alba* - *Carya (alba, ovata)* - *Liriodendron tulipifera* - (*Quercus phellos*) / *Cornus florida* Forest (CEGL007709)

*Quercus phellos* - *Quercus alba* / *Vaccinium fuscatum* - (*Viburnum nudum*) / *Carex (barrattii, intumescens)* Forest (CEGL007364)

**Global Related Concepts:**

Sweet gum-red maple-red bay community (Jones et al. 1981b) ?

**OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION****Chickamauga-Chattanooga National Military Park Range:**

**Global Range:** This association is known from the Piedmont, Interior Low Plateau, Inner South Atlantic Coastal Plain, and possibly other provinces.

**Nations:** US

**States/Provinces:** AL, GA?, KY, MS, NC, NJ, SC, TN

**USFS Ecoregions:** 221Hc:CCC, 222Cg:CCC, 222Eb:CCC, 222Eg:CCC, 231Aa:CCC, 231Cd:CCP, 231Cg:CCC, 231D:CC, 232Cg:CCC

**Federal Lands:** DOD (Arnold, Fort Benning?); DOE (Savannah River Site); NPS (Big South Fork, Chickamauga-Chattanooga?, Cowpens, Fort Donelson, Kings Mountain, Little River Canyon, Mammoth Cave, Natchez Trace, Shiloh); USFS (Bankhead?, Bienville?, Daniel Boone, De Soto?, Delta?, Francis Marion?, Holly Springs?, Homochitto?, Oconee?, Sumter (Piedmont)?, Talladega (Oakmulgee)?, Talladega?, Tombigbee?, Tuskegee?)

**ELEMENT SOURCES****Chickamauga-Chattanooga National Military Park Inventory Notes:****Chickamauga-Chattanooga National Military Park Plots:**

**Local Description Authors:****Global Description Authors:** mod. R. White**References:** Jones et al. 1981b, NatureServe Ecology - Southeastern U.S. unpubl. data, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, TNC 1998a**Piedmont / Ridge and Valley Small Stream Sweetgum - Tuliptree Forest***Liquidambar styraciflua* - *Liriodendron tulipifera* / *Lindera benzoin* / *Arisaema triphyllum* ssp. *triphyllum* Forest

Sweetgum - Tuliptree / Northern Spicebush / Jack-in-the-Pulpit Forest

Identifier: CEGL004418

**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</i>
	<i>triphyllum</i> ssp.
	<i>triphyllum</i> Forest
Association (English name)	Sweetgum - Tuliptree / Northern Spicebush / Jack-in-the-Pulpit Forest
Association (Common name)	Piedmont / Ridge and Valley Small Stream Sweetgum - Tuliptree Forest
<b>Ecological System(s):</b>	Southern Piedmont Small Floodplain and Riparian Forest (CES202.323)

**ELEMENT CONCEPT**

**Global Summary:** These low-elevation forests develop along small streams in the Piedmont, extending west into the Cumberland Plateau and Ridge and Valley. The topographic features of floodplains can heavily influence the individual makeup of examples of this association. Soils are relatively acidic. The canopy, subcanopy, shrub, and herbaceous layers often are well-developed. Dominant canopy species always include *Liquidambar styraciflua* and *Liriodendron tulipifera*, while *Acer barbatum* and *Acer rubrum* var. *rubrum* 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*, *Aesculus sylvatica*, *Carpinus caroliniana* ssp. *caroliniana*, *Cornus florida*, *Fagus grandifolia*, *Juglans nigra*, *Morus rubra* var. *rubra*, *Ostrya virginiana* var. *virginiana*, *Oxydendrum arboreum*, *Pinus echinata*, *Prunus serotina* var. *serotina*, *Quercus alba*, *Quercus rubra* var. *rubra*, *Ulmus rubra*, *Ulmus americana*, *Ulmus alata*, *Juniperus virginiana* var. *virginiana*, *Nyssa sylvatica*, *Fraxinus americana*, *Halesia tetraptera* var. *tetraptera*, *Arundinaria gigantea* ssp. *gigantea*, *Cornus florida*, and *Fraxinus pennsylvanica*. *Euonymus americanus*, *Lindera benzoin* var. *benzoin*, and *Corylus americana* are common and dominant in the shrub layer. The herbaceous layer is species-rich and often has good sedge development. The exotics *Microstegium vimineum*, *Ligustrum sinense*, and *Lonicera japonica* are common in this community.

**ENVIRONMENTAL DESCRIPTION****USFWS Wetland System:** Palustrine**Chickamauga-Chattanooga National Military Park Environment:****Global Environment:** These forests develop along small streams. Soils are relatively acidic. The topographic features of floodplains can heavily influence the individual makeup of examples of this association.

## VEGETATION DESCRIPTION

### Chickamauga-Chattanooga National Military Park Vegetation:

**Global Vegetation:** The canopy, subcanopy, shrub, and herbaceous layers of stands of this association are often well-developed. Dominant canopy species always include *Liquidambar styraciflua* and *Liriodendron tulipifera*, while *Acer barbatum* and *Acer rubrum* var. *rubrum* 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*, *Aesculus sylvatica*, *Carpinus caroliniana* ssp. *caroliniana*, *Cornus florida*, *Fagus grandifolia*, *Juglans nigra*, *Morus rubra* var. *rubra*, *Ostrya virginiana* var. *virginiana*, *Oxydendrum arboreum*, *Pinus echinata*, *Prunus serotina* var. *serotina*, *Quercus alba*, *Quercus rubra* var. *rubra*, *Ulmus rubra*, *Ulmus americana*, *Ulmus alata*, *Juniperus virginiana* var. *virginiana*, *Nyssa sylvatica*, *Fraxinus americana*, *Halesia tetraptera* var. *tetraptera*, *Arundinaria gigantea* ssp. *gigantea*, *Cornus florida*, and *Fraxinus pennsylvanica*. *Euonymus americanus*, *Lindera benzoin* var. *benzoin*, and *Corylus americana* are common and dominant in the shrub layer. Other shrub species that may be present include *Viburnum acerifolium*, *Viburnum nudum* var. *nudum*, *Viburnum prunifolium*, *Viburnum rufidulum*, *Hamamelis virginiana*, *Asimina triloba*, and *Ilex decidua*, among others. Vines are prominent and species include *Vitis rotundifolia*, *Apios americana*, *Campsis radicans*, *Aristolochia serpentaria*, *Bignonia capreolata*, *Dioscorea quaternata*, *Gelsemium sempervirens*, *Parthenocissus quinquefolia* (= var. *quinquefolia*), *Campsis radicans*, *Passiflora lutea*, *Smilax bona-nox*, *Smilax glauca*, *Smilax hugeri*, *Smilax rotundifolia*, and *Toxicodendron radicans* ssp. *radicans*. The herbaceous layer is species-rich and often has good sedge development. Common species in this layer include *Thalictrum thalictroides*, *Trillium cuneatum*, *Arisaema triphyllum* ssp. *triphyllum*, *Asplenium platyneuron* var. *platyneuron*, *Botrychium virginianum*, *Carex* spp., *Carex impressinervia*, *Carex striatula*, *Galium circaezans*, *Geum canadense*, *Polystichum acrostichoides*, and *Scutellaria integrifolia*, among many others. Soils are relatively acid. The exotics *Microstegium vimineum*, *Ligustrum sinense*, and *Lonicera japonica* are common in this community. Other exotics that colonize quickly in disturbed and fragmented versions of this association include *Wisteria sinensis*, *Rosa multiflora*, *Clematis terniflora*, *Hedera helix*, and *Elaeagnus* sp.

### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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### CHARACTERISTIC SPECIES

#### Chickamauga-Chattanooga National Military Park:

Global:

### OTHER NOTEWORTHY SPECIES

#### Chickamauga-Chattanooga National Military Park:

Global: *Carex impressinervia*

### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G3 (17-May-2002). This community, and other types of floodplain forests, are threatened by alteration of the hydroperiod by artificial impoundments or river diversion projects, or the disruption of the floodplain communities by forestry or agriculture. The largest threat, however, is the invasive exotic species that have colonized most of the remaining examples of this association.

### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 3 - Weak

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** 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* are the best ways to distinguish these two types. In addition, stands of CEGL007330 will generally be more even-aged and single species-dominated than this association (CEGL004418).

**Global 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* - *Liquidambar styraciflua* / *Medeola virginiana* Forest (CEGL006601)

**Global 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

**OTHER COMMENTS**

**Other Comments:**

**ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This association was observed on Lookout Creek, but no plot data were taken.

**Global Range:** This association is found in 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 Atlantic Coastal Plain of Virginia, the Carolinas, and Georgia. Its status in the Upper East Gulf Coastal Plain is unknown.

**Nations:** US

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

**USFS Ecoregions:** 231Ae:CCC, 231Af:CCC, 231Cc:CCC

**Federal Lands:** NPS (Chickamauga-Chattanooga, Cowpens, Guilford Courthouse, Kings Mountain, Thomas Stone); USFS (Uwharrie)

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** none.

**Local Description Authors:**

**Global Description Authors:** R.K. Peet, mod. R. White and M. Pyne

**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.

**Sycamore - Silver Maple Calcareous Floodplain Forest**

*Platanus occidentalis* - *Acer saccharinum* - *Juglans nigra* - *Ulmus rubra* Forest

Sycamore - Silver Maple - Black Walnut - Slippery Elm Forest

Identifier: CEGL007334

**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>Platanus occidentalis</i> - ( <i>Fraxinus pennsylvanica</i> , <i>Celtis laevigata</i> , <i>Acer saccharinum</i> ) Temporarily
	Flooded Forest Alliance (A.288)
Alliance (English name)	Sycamore - (Green Ash, Sugarberry, Silver Maple) Temporarily Flooded Forest Alliance
Association	<i>Platanus occidentalis</i> - <i>Acer saccharinum</i> - <i>Juglans nigra</i> - <i>Ulmus rubra</i> Forest
Association (English name)	Sycamore - Silver Maple - Black Walnut - Slippery Elm Forest
Association (Common name)	Sycamore - Silver Maple Calcareous Floodplain Forest
<b>Ecological System(s):</b>	Central Appalachian Floodplain (CES202.608) South-Central Interior Large Floodplain (CES202.705)

### ELEMENT CONCEPT

**Global Summary:** This sycamore - silver maple floodplain forest occurs along riverfronts in calcareous areas of the east-central United States, including forests along small streams. Stands are dominated by *Platanus occidentalis*, with a mixture of other species, including *Acer negundo*, *Acer saccharinum*, *Fraxinus americana*, *Fraxinus pennsylvanica*, *Juglans nigra*, *Ulmus americana*, and *Ulmus rubra*. Shrubs include *Asimina triloba* and *Lindera benzoin*. Vines may be abundant, including *Parthenocissus quinquefolia* and *Toxicodendron radicans*. Herbaceous species include *Arisaema triphyllum*, *Asarum canadense*, *Boehmeria cylindrica*, *Elymus virginicus*, *Pilea pumila*, *Polygonum virginianum*, and others.

### ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:** Palustrine

**Chickamauga-Chattanooga National Military Park Environment:** This association occurs on the floodplain of Lookout Creek and the Tennessee River at Moccasin Bend. These areas are regularly but temporarily flooded. The alluvial deposits are nutrient-rich, presumably from dolomites of the Knox Group and/or Mississippian limestones associated with Lookout Mountain. Elevations of sites are approximately 200 m (660 feet).

**Global Environment:** This association occurs along riverfronts in calcareous areas, including forests along small streams (Weakley et al. 1998). The creation in 2000 of *Platanus occidentalis* - *Celtis laevigata* - *Liriodendron tulipifera* / *Lindera benzoin* - *Arundinaria gigantea* / *Amphicarpaea bracteata* Forest (CEGL008429) may dictate that the use of this type (CEGL007334), at least in their range of overlap, would be more appropriate for large rivers rather than "small streams."

### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** The canopy of examples at Lookout Creek and Moccasin Bend are dominated by *Acer saccharinum*, *Acer negundo*, *Platanus occidentalis*, and *Fraxinus pennsylvanica*. *Juglans nigra* and *Fraxinus americana* are less frequent subcanopy members. The shrub layer is strongly dominated by a dense cover of *Lindera benzoin*, but the non-native shrub *Ligustrum sinense* is also abundant. *Sambucus canadensis* is also present at a low coverage. The herb layer is well-developed and diverse with species indicative of high nutrient levels. This includes *Laportea canadensis*, *Cardamine bulbosa*, *Polygonum virginianum*, *Sanicula odorata*, *Trillium lancifolium*, and *Allium canadense*. Other species found here are associated with frequently flooded sites, such as *Arisaema dracontium*, *Chasmanthium latifolium*, *Carex grayi*, *Carex amphibola*, *Boehmeria cylindrica*, *Packera glabella*, *Impatiens capensis*, and *Rudbeckia laciniata*. Vines are also prominent, including *Parthenocissus quinquefolia* and *Toxicodendron radicans*.

**Global Vegetation:** Stands are dominated by *Platanus occidentalis*, with a mixture of other species, including *Acer negundo*, *Acer saccharinum*, *Fraxinus americana*, *Fraxinus pennsylvanica*, *Juglans nigra*, *Ulmus americana*, and *Ulmus rubra*. Shrubs include *Asimina triloba* and *Lindera benzoin*. Vines may be abundant, including *Parthenocissus quinquefolia* and *Toxicodendron radicans*. Herbaceous species include *Arisaema triphyllum*, *Asarum canadense*, *Boehmeria cylindrica*, *Elymus virginicus*, *Pilea pumila*, *Polygonum virginianum*, and others (Van Kley et al. 1995, Weakley et al. 1998). *Acer saccharinum* may be a differential species in relation to some of the other associations in this alliance, as it is apparently absent from the southeastern Atlantic Coastal Plain and at the edge of its range in the southern Piedmont.

### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Platanus occidentalis</i>
Tree subcanopy	Broad-leaved deciduous tree	<i>Acer negundo</i>
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Lindera benzoin</i>

#### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Acer negundo*, *Acer saccharinum*, *Allium canadense*, *Boehmeria cylindrica*, *Carex amphibola*, *Carex grayi*, *Chasmanthium latifolium*, *Fraxinus pennsylvanica*, *Impatiens capensis*, *Lindera benzoin*, *Packera glabella*, *Platanus occidentalis*, *Polygonum virginianum*, *Sanicula odorata*, *Trillium lancifolium*

**Global:** *Acer negundo*, *Acer saccharinum*, *Alliaria petiolata*, *Asimina triloba*, *Chaerophyllum procumbens*, *Fraxinus pennsylvanica*, *Mertensia virginica*, *Platanus occidentalis*, *Verbesina alternifolia*

### OTHER NOTEWORTHY SPECIES

#### Chickamauga-Chattanooga National Military Park:

**Global:** *Erythronium albidum*, *Maianthemum stellatum*

### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G4 (4-Jan-2001). This type is apparently somewhat restricted in habitat, but with a wide range, and not highly threatened. Timber removal will cause disruption, but permanent conversion to other forest types is less likely. This community and other types of floodplain forests are threatened by alteration of the hydroperiod by artificial impoundments or river diversion projects, or the disruption of the floodplain communities by forestry or agriculture.

### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

#### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** This type could be in Illinois and Missouri. It is not well characterized yet and may be difficult to distinguish from other floodplain forests where *Platanus* is conspicuous without being dominant. For example, see *Acer saccharinum* - *Ulmus americana* Forest (CEGL002586), *Fraxinus pennsylvanica* - *Celtis* spp. - *Quercus* spp. - *Platanus occidentalis* Bottomland Forest (CEGL002410), *Fraxinus pennsylvanica* - *Ulmus americana* - *Celtis laevigata* / *Ilex decidua* Forest (CEGL002427), and *Fraxinus pennsylvanica* - *Ulmus* spp. - *Celtis occidentalis* Forest (CEGL002014). It is possible that CEGL002410 could be merged with this type, depending on level of dominance required for *Platanus*.

#### Global Similar Associations:

*Acer saccharinum* - *Acer negundo* / *Ageratina altissima* - *Laportea canadensis* - (*Elymus virginicus*) Forest (CEGL006217)

*Acer saccharinum* - *Ulmus americana* Forest (CEGL002586)

*Fraxinus pennsylvanica* - *Celtis* spp. - *Quercus* spp. - *Platanus occidentalis* Bottomland Forest (CEGL002410)

*Fraxinus pennsylvanica* - *Ulmus americana* - *Celtis laevigata* / *Ilex decidua* Forest (CEGL002427)

*Fraxinus pennsylvanica* - *Ulmus* spp. - *Celtis occidentalis* Forest (CEGL002014)

*Platanus occidentalis* - *Acer negundo* - *Juglans nigra* / *Asimina triloba* / *Mertensia virginica* Forest (CEGL004073)-  
-is found in Maryland, Virginia, West Virginia, and possibly Pennsylvania.

*Platanus occidentalis* - *Celtis laevigata* - *Liriodendron tulipifera* / *Lindera benzoin* - *Arundinaria gigantea* / *Amphicarpaea bracteata* Forest (CEGL008429)--on small to medium-sized terraces of small streams.

*Platanus occidentalis* - *Fraxinus pennsylvanica* / *Carpinus caroliniana* / *Verbesina alternifolia* Forest (CEGL006458)

**Global Related Concepts:**

ELTP 61: *Platanus / Asarum*, Wet-mesic Bottomlands (Van Kley et al. 1995) =  
 IIA6e. Southern Appalachian Alluvial Forest (Allard 1990) B  
 Silver Maple - Sycamore Forest on Base-rich Alluvium (Palmer-Ball et al. 1988) =  
 Sycamore-green ash floodplain forest (CAP pers. comm. 1998) ?

**OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This association occurs on the floodplain of Lookout Creek and the Tennessee River at Moccasin Bend.

**Global Range:** This association occurs on river and large stream floodplains in calcareous areas of the east-central United States from Indiana and Kentucky and possibly Ohio, south to Tennessee. Range extent may be approximately 300,000 square km.

**Nations:** US

**States/Provinces:** GA, IN, KY, MO, OH, TN, VA

**USFS Ecoregions:** 221Ec:CC, 221Ed:CCP, 221Ef:CCP, 221Eg:CCC, 221Ha:CCC, 221Hc:CCC, 221He:CCC, 222Cg:CCC, 222De:CCP, 222Eb:CCC, 222Eg:CCC, 222Em:CCP, 222En:CCC, 222Eo:CCC, 222Fa:CCC, 222Fb:CCC, 222Fc:CCC, 222Fd:CCC, 222Hb:CCC, 222Hf:CCC, 231Aa:PPP

**Federal Lands:** NPS (Chickamauga-Chattanooga, Fort Donelson, Lincoln Birthplace, Mammoth Cave, Natchez Trace, Ozark, Shiloh); USFS (Daniel Boone, Jefferson?)

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.36, CHCH.42, CHCH.46.

**Local Description Authors:** T. Govus

**Global Description Authors:** D. Faber-Langendoen, mod. K.D. Patterson

**References:** Allard 1990, CAP pers. comm. 1998, Palmer-Ball et al. 1988, Schafale and Weakley 1990, Southeastern Ecology Working Group n.d., TDNH unpubl. data, Van Kley et al. 1995, Weakley et al. 1998

**Rich Levee Mixed Hardwood Bottomland Forest**

*Platanus occidentalis* - *Celtis laevigata* - *Liriodendron tulipifera* / *Lindera benzoin* - *Arundinaria gigantea* /

*Amphicarpaea bracteata* Forest

Sycamore - Sugarberry - Tuliptree / Northern Spicebush - Giant Cane / American Hog-peanut Forest

Identifier: CEGL008429

**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>Platanus occidentalis</i> - ( <i>Fraxinus pennsylvanica</i> , <i>Celtis laevigata</i> , <i>Acer saccharinum</i> ) Temporarily
	Flooded Forest Alliance (A.288)
Alliance (English name)	Sycamore - (Green Ash, Sugarberry, Silver Maple) Temporarily Flooded Forest
Alliance	

Association	<i>Platanus occidentalis</i> - <i>Celtis laevigata</i> - <i>Liriodendron tulipifera</i> / <i>Lindera benzoin</i> - <i>Arundinaria gigantea</i> / <i>Amphicarpaea bracteata</i> Forest
Association (English name)	Sycamore - Sugarberry - Tuliptree / Northern Spicebush - Giant Cane / American Hog-peanut Forest
Association (Common name)	Rich Levee Mixed Hardwood Bottomland Forest
<b>Ecological System(s):</b>	South-Central Interior Small Stream and Riparian (CES202.706)

#### ELEMENT CONCEPT

**Global Summary:** This forest occurs on infrequently flooded, base-rich alluvial terraces along small streams. It was originally described from the Bankhead National Forest in the Cumberland Plateau of northern Alabama, and also includes occurrences in the Ridge and Valley portion of the Chattahoochee National Forest of Georgia, and Chickamauga-Chattanooga National Military Park. In addition to *Platanus occidentalis*, *Celtis laevigata*, and *Liriodendron tulipifera*, other dominants of the closed canopy can include *Acer negundo*, *Juglans nigra* and *Fraxinus pennsylvanica*. Other canopy components can include *Quercus shumardii*, *Quercus muehlenbergii*, *Carya glabra*, *Carya ovata*, and occasionally *Fraxinus americana*. Midstory components include *Carpinus caroliniana*, *Acer barbatum*, *Ulmus rubra*, and *Tilia americana*. The understory is dominated by *Lindera benzoin*. Other understory components include *Arundinaria gigantea*, which may be dominant in patches, and *Asimina triloba*. The ground cover flora is variable in composition and cover. Ground cover components include *Polystichum acrostichoides*, *Elymus virginicus*, *Verbesina occidentalis*, *Verbesina virginica*, *Verbesina alternifolia*, *Viola* sp., *Chasmanthium latifolium*, *Polygonum virginianum*, and *Boehmeria cylindrica*. This community is reported to have a rich herbaceous flora in the spring. *Microstegium vimineum* is a common invasive exotic in this community.

#### ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:** Palustrine

**Chickamauga-Chattanooga National Military Park Environment:** The examples at Chickamauga-Chattanooga National Military Park include an atypical occurrence located in a poorly drained site adjacent to Chickamauga Creek. This area is surrounded by pasture and young and successional in character. Inundation occurs here most probably from seasonal rainfall and less frequently from flooding along Chickamauga Creek. The elevation is 220 m (720 feet). A better example is located on Chandler Hollow Creek in a more typical situation involving a broad floodplain that undergoes regular but temporary flooding. Soils are rich in calcium deposited from the weathering of dolostones and limestones of the Chickamauga and Knox groups.

**Global Environment:** This association occurs on small stream terraces in the Cumberland Plateau of northern Alabama and Ridge and Valley of northwestern Georgia. These alluvial deposits are apparently somewhat calcareous, resulting from erosion of limestone strata within the surrounding watersheds.

#### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** Occurrences here are strongly dominated by *Platanus occidentalis*, *Fraxinus pennsylvanica*, and *Celtis laevigata*, along with lesser amounts of *Gleditsia triacanthos* and *Ulmus rubra*. *Acer negundo* and *Carpinus caroliniana* dominate the understory of these stands. The shrub layer varies from dense patches of the non-native and invasive *Ligustrum sinense* to more natural situations with *Lindera benzoin*, *Arundinaria gigantea*, and *Asimina triloba*. The stand located along Chandler Hollow Creek is unusual in that it includes *Quercus lyrata* in the understory and shrub layers. The herb layer is well-developed and largely dominated by species adapted to frequent flooding as well as rich substrates. *Elymus virginicus*, *Boehmeria cylindrica*, *Chasmanthium latifolium*, *Carex cherokeensis*, *Polygonum virginianum*, *Viola sororia*, *Carex grayi*, *Scirpus polyphyllus*, and the exotic *Lysimachia nummularia* are the most frequent species that were documented.

**Global Vegetation:** In addition to *Platanus occidentalis*, *Celtis laevigata*, and *Liriodendron tulipifera*, other dominants of the closed canopy can include *Acer negundo*, *Juglans nigra* and *Fraxinus pennsylvanica*. Other canopy components include *Quercus shumardii*, *Quercus muehlenbergii*, *Carya glabra*, *Carya ovata*, and *Fraxinus americana*. Midstory components include *Carpinus caroliniana*, *Acer barbatum*, *Ulmus rubra*, and *Tilia americana*. The understory is dominated by *Lindera benzoin*. Other understory components include *Arundinaria gigantea*, which may be dominant in patches, and *Asimina triloba*. The ground cover flora is variable in composition and cover. Ground cover components include *Polystichum acrostichoides*, *Elymus virginicus*, *Verbesina occidentalis*, *Verbesina virginica*, *Verbesina alternifolia*, *Viola* sp., *Chasmanthium latifolium*, *Polygonum virginianum*, and

*Boehmeria cylindrica*. This community is reported to have a rich herbaceous flora in the spring. *Microstegium vimineum* is a common invasive exotic in this community.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Celtis laevigata</i> , <i>Platanus occidentalis</i>
Tree subcanopy	Broad-leaved deciduous tree	<i>Carpinus caroliniana</i>

#### HERB (FIELD) *CHASMANTHIUM LATIFOLIUM*

##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Arundinaria gigantea*, *Boehmeria cylindrica*, *Carpinus caroliniana*, *Celtis laevigata*, *Chasmanthium latifolium*, *Fraxinus pennsylvanica*, *Lindera benzoin*, *Platanus occidentalis*, *Polygonum virginianum*

##### Global:

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

##### Global:

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G3G4Q (13-Jun-2000). As currently described, this association is restricted geographically to the southern Cumberland Plateau and portions of the southern Ridge and Valley. In addition, it is confined to calcareous terraces along small streams. The global rank reflects the possibility that this type may be considered more common as a result of taxonomic revision.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 3 - Weak

##### Chickamauga-Chattanooga National Military Park Comments:

##### Global Comments:

##### Global Similar Associations:

*Platanus occidentalis* - *Acer saccharinum* - *Juglans nigra* - *Ulmus rubra* Forest (CEGL007334)--on the riverfronts of medium to large streams/rivers.

##### Global Related Concepts:

#### OTHER COMMENTS

##### Other Comments:

#### ELEMENT DISTRIBUTION

**Chickamauga-Chattanooga National Military Park Range:** To date, this association has only been documented at Chickamauga Battlefield along tributaries of West Chickamauga Creek. It could potentially occur at Lookout Mountain in association with Lookout Creek.

**Global Range:** As currently described, the range of this association is confined to the southern Cumberland Plateau and portions of the southern Ridge and Valley.

**Nations:** US

**States/Provinces:** AL, GA

**USFS Ecoregions:** 231Cd:CCC, 231Da:CCC, 231Dc:CCC

**Federal Lands:** NPS (Chickamauga-Chattanooga, Russell Cave); USFS (Bankhead, Chattahoochee, Chattahoochee (Southern Blue Ridge))

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.19, CHCH.54.

**Local Description Authors:** T. Govus

**Global Description Authors:** J. Teague

**References:** NatureServe Ecology - Southeastern U.S. unpubl. data, Schotz pers. comm., Southeastern Ecology Working Group n.d.

#### **Southern Interior Oak Bottomland Forest**

*Quercus shumardii* - *Quercus michauxii* - *Quercus nigra* / *Acer barbatum* - *Tilia americana* var.

*heterophylla* Forest

Shumard Oak - Swamp Chestnut Oak - Water Oak / Southern Sugar Maple - Appalachian Basswood Forest

Identifier: CEGL008487

#### **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>Quercus (michauxii, pagoda, shumardii)</i> - <i>Liquidambar styraciflua</i> Temporarily
Flooded Forest	Alliance (A.291)
Alliance (English name)	(Swamp Chestnut Oak, Cherrybark Oak, Shumard Oak) - Sweetgum Temporarily
Flooded Forest	Alliance
Association	<i>Quercus shumardii</i> - <i>Quercus michauxii</i> - <i>Quercus nigra</i> / <i>Acer barbatum</i> - <i>Tilia</i>
<i>americana</i> var.	<i>heterophylla</i> Forest
Association (English name)	Shumard Oak - Swamp Chestnut Oak - Water Oak / Southern Sugar Maple -
Appalachian	Basswood Forest
Association (Common name)	Southern Interior Oak Bottomland Forest
<b>Ecological System(s):</b>	East Gulf Coastal Plain Large River Floodplain Forest (CES203.489)
	East Gulf Coastal Plain Small Stream and River Floodplain Forest (CES203.559)
	Southern Piedmont Large Floodplain Forest (CES202.324)
	Southern Piedmont Small Floodplain and Riparian Forest (CES202.323)

#### ELEMENT CONCEPT

**Global Summary:** This association covers bottomland forests of the southern Piedmont of Georgia and South Carolina, the Piedmont-Ridge and Valley transition region of Alabama, the adjacent Upper East Gulf Coastal Plain of Georgia, and the Southern Ridge and Valley of Georgia and Tennessee. Stands occur in broad flat floodplains of

medium-sized rivers, or as smaller occurrences along creeks and their adjacent floodplains. The diverse canopy is primarily composed of bottomland terrace species, but may also contain some levee species which would normally sort out better along a hydrologic gradient in the larger floodplains of the Coastal Plain. The canopy of stands is typically dominated by *Quercus shumardii* and *Quercus michauxii* with *Liquidambar styraciflua* and *Quercus nigra*. This type is found either in the outer edges of the Piedmont, in the transition area to the Ridge and Valley, or just barely coastward of the Fall-line, so *Quercus pagoda* is either not present at all, or if present it is at very low frequency. Other canopy and/or subcanopy species may include *Acer barbatum*, *Liriodendron tulipifera*, *Tilia americana* var. *heterophylla*, *Carya cordiformis* (which may have high cover), *Carya carolinae-septentrionalis*, *Juglans nigra*, *Quercus phellos*, and *Pinus taeda*. Occasionally, *Celtis laevigata*, *Platanus occidentalis* or *Betula nigra* may be present at low values, but they are not characteristic and may signal the start of a different bottomland community type when noted in large quantities. The rare tree *Quercus oglethorpensis* may be present within its limited range in the driest versions of this community (e.g., in Elbert and Wilkes counties of Piedmont Georgia and Greenwood and McCormick counties of Piedmont South Carolina). Shrubs include *Arundinaria gigantea* (which may be dominant in some stands), *Lindera benzoin*, *Ilex decidua*, *Callicarpa americana*, and *Corylus americana*. Woody vines may be prominent in stands. The herb stratum is fairly diverse.

#### ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:** Palustrine

**Chickamauga-Chattanooga National Military Park Environment:** This association is located on the relatively small floodplains of Lookout Creek where it is subjected to regular, but temporary, inundation. The soils are fairly nutrient-rich due to the influence of weathered limestones associated with Lookout Mountain.

**Global Environment:** Stands of this association occur in broad flat floodplains of medium-sized rivers, or as smaller occurrences along creeks and adjacent floodplains.

#### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** The canopy for the example studied is strongly dominated by *Quercus shumardii* with lesser amounts of *Carya carolinae-septentrionalis*, *Liriodendron tulipifera*, *Liquidambar styraciflua*, and *Quercus nigra*. *Carpinus caroliniana*, *Ostrya virginiana*, and *Quercus alba* are the most common understory/subcanopy species. The shrub layer is sparse, including some members of the subcanopy such as *Carpinus caroliniana* and *Ostrya virginiana*, but also including *Lindera benzoin*. Woody vines make up the largest portion of the ground layer. *Parthenocissus quinquefolia*, *Toxicodendron radicans*, *Smilax rotundifolia*, and *Campsis radicans* are most prominent. Other conspicuous herbaceous species within the ground layer include *Thaspium* sp., *Sanicula canadensis*, *Chasmanthium latifolium*, and *Carex* sp.

**Global Vegetation:** The canopy of stands is typically dominated by *Quercus shumardii* and *Quercus michauxii* with *Liquidambar styraciflua* and *Quercus nigra*. This type is found either in the Piedmont, in the transition area to the Ridge and Valley, or just barely coastward of the Fall-line, so *Quercus pagoda* is either not present at all, or if present it is at very low frequency. Other canopy and/or subcanopy species may include *Acer barbatum*, *Liriodendron tulipifera*, *Tilia americana* var. *heterophylla*, *Carya cordiformis* (which may have high cover), *Carya carolinae-septentrionalis*, *Juglans nigra*, *Quercus phellos*, and *Pinus taeda*. Occasionally, *Celtis laevigata*, *Platanus occidentalis* or *Betula nigra* may be present at low values, but they are not characteristic. The rare tree *Quercus oglethorpensis* may be present within its limited range (e.g., in Elbert and Wilkes counties of Piedmont Georgia). Some additional subcanopy and tall shrub components are *Fagus grandifolia*, *Fraxinus pennsylvanica*, *Fraxinus americana*, *Carpinus caroliniana*, *Ulmus alata*, *Acer barbatum*, *Acer leucoderme*, *Halesia tetraptera*, *Carya alba*, *Carya ovalis*, *Cornus florida*, *Morus rubra*, *Prunus serotina*, *Ilex decidua*, *Cercis canadensis*, *Aesculus pavia*, *Aesculus sylvatica*, and *Asimina triloba*. Shrubs include *Arundinaria gigantea* (which may be dominant in some stands), *Lindera benzoin*, *Ilex decidua*, *Callicarpa americana*, and *Corylus americana*. Woody vines may be prominent in stands. They include *Toxicodendron radicans*, *Vitis rotundifolia*, *Parthenocissus quinquefolia*, *Bignonia capreolata*, *Smilax bona-nox*, *Berchemia scandens*, *Campsis radicans*, *Clematis virginiana*, *Decumaria barbara*, and *Smilax rotundifolia*. The herb stratum includes *Chasmanthium latifolium*, *Dichantherium boscii* (= *Panicum boscii*), *Ageratina altissima* (= *Eupatorium rugosum*), *Solidago caesia*, *Carex abscondita*, *Vernonia gigantea*, *Boehmeria cylindrica*, *Polystichum acrostichoides*, *Mitchella repens*, *Bromus pubescens*, *Dioscorea quaternata*, *Symphotrichum lateriflorum* (= *Aster lateriflorus*), *Commelina virginica*, *Carex crinita*, *Carex intumescens*, *Carex laxiflora*, *Carex picta*, *Carex rosea*, *Carex typhina*, *Carex venusta*, *Matelea carolinensis*, and others. There is some concern about the identity of the *Tilia americana* in stands of this association. In some

examples, it could be *Tilia americana* var. *caroliniana*. The exotic species *Lonicera japonica*, *Ligustrum sinense*, and *Microstegium vimineum* may invade stands of this association. Both of the nominal oaks may be of lesser frequency north of about the latitude of Atlanta and Athens, Georgia (Burns and Honkala 1990a).

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus shumardii</i>
Shrub/sapling (tall & short)	Vine/Liana	<i>Parthenocissus quinquefolia</i> , <i>Toxicodendron radicans</i>

##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Carya carolinae-septentrionalis*, *Chasmanthium latifolium*, *Lindera benzoin*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Parthenocissus quinquefolia*, *Quercus shumardii*, *Toxicodendron radicans*

##### Global:

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:** *Quercus oglethorpensis*

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G3 (24-Oct-2002). This association is restricted in range. Some examples are afforded some protection at Fort Benning (Georgia/Alabama), in the Oconee National Forest (Georgia), at Ninety Six National Historic Park (South Carolina), and in the Talladega National Forest (Alabama). Many examples have been lost to flooding from impoundments, timber removal, and conversion to agriculture or other commercial forest types. Threats include fragmentation from powerline corridors and sewerline easements, siltation from land disturbance and development upstream, and anthropogenic flooding from wildlife subimpoundments and other hydrologic enhancements. The exotic species *Lonicera japonica*, *Ligustrum sinense*, and *Microstegium vimineum* may invade stands of this association, especially those altered from nearby fragmentation or from siltation from land disturbance upstream. Stands on impounded rivers may suffer from altered hydrologies. This community's rank was changed from G3G4 to G3 due to its relative scarcity, the restriction of its range to small parts of 3 ecoregions, and the fact that few high-quality examples of this community are left. These communities are declining as invasive exotic plants continue to invade areas and as large-scale manipulation of the floodplain areas of South Carolina continues to occur.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

##### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** As defined, the primary range of this type is in the southern part of the slate belts (Subsection 231Aa), the nearby Piedmont-Ridge and Valley transition region (Subsections 231Ac, 231Db, 231Dd) and the immediately adjacent Coastal Plain (as at Fort Benning, Georgia/Alabama) where all the rivers flow southward from the Piedmont and do not provide vectors into the Piedmont for Coastal Plain species such as *Quercus pagoda*, which is largely absent from stands of this type. Its range could include portions of the middle Chattahoochee River, the Savannah River and their tributaries, and the upper Saluda River, as well as the upper portions of the Flint, the Yellow River, the Oconee and Little Oconee, the Ogeechee, and their tributaries. In Alabama, in the Piedmont-Ridge and Valley transition region, this would include the Coosa and Tallapoosa and their tributaries as well. The northern extent of this type extends to the Southern Ridge and Valley of Georgia and Tennessee. The name of this association may need revision; the distinctions (floristic and nomenclatural) between this type and other more common Piedmont bottomland associations need further investigation. A study in the lower Piedmont of Alabama

by Golden (1979) does not recognize an equivalent to this type, as his study site did not contain enough unimpounded bottomland to have any samples related to it.

**Global Similar Associations:**

*Carya (glabra, alba) - Fraxinus americana - (Juniperus virginiana var. virginiana)* Woodland (CEGL003752)--of the Triassic Piedmont, with *Quercus pagoda*.

**Global Related Concepts:**

Alluvial river and swamp system - Piedmont (Wharton 1978) B

**OTHER COMMENTS**

**Other Comments:**

**ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This association is only located on the floodplains of Lookout Creek on the western edge of Lookout Mountain.

**Global Range:** This bottomland forest is found in the southern Piedmont of Georgia and South Carolina, as well as the Piedmont-Ridge and Valley transition region of Alabama and possibly the adjacent Upper East Gulf Coastal Plain of Georgia and Alabama. It has also been documented from the Southern Ridge and Valley of Georgia and Tennessee. Its range could include portions of the middle Chattahoochee River, the Savannah River and their tributaries, and the upper Saluda River, as well as the upper portions of the Flint, the Yellow River, the Oconee and Little Oconee, the Ogeechee, and their tributaries. In Alabama, in the Piedmont-Ridge and Valley transition region, this would include the Coosa and Tallapoosa and their tributaries as well. In the Southern Ridge and Valley of Georgia and Tennessee it apparently includes tributaries of the Tennessee River (Lookout Creek).

**Nations:** US

**States/Provinces:** AL, GA, SC

**USFS Ecoregions:** 231Aa:CCC, 231Ac:CCC, 231Ae:CCP, 231Ai:CCP, 231Aj:CCP, 231Bd:CCC, 231Cc:CCC, 231Db:CCC, 231Dd:CCP

**Federal Lands:** DOD (Fort Benning); NPS (Chickamauga-Chattanooga, Ninety Six); USFS (Oconee, Talladega, Talladega (Oakmulgee), Talladega (Talladega))

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.53.

**Local Description Authors:** T. Govus

**Global Description Authors:** M. Pyne

**References:** Ambrose 1990a, Burns and Honkala 1990a, NatureServe Ecology - Southeastern U.S. unpubl. data, Schotz pers. comm., Southeastern Ecology Working Group n.d., Wharton 1978

**Black Willow Riparian Forest**

*Salix nigra* Forest

Black Willow Forest

Identifier: CEGL002103

**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>Salix nigra</i> Temporarily Flooded Forest Alliance (A.297)
Alliance (English name)	Black Willow Temporarily Flooded Forest Alliance
Association	<i>Salix nigra</i> Forest
Association (English name)	Black Willow Forest
Association (Common name)	Black Willow Riparian Forest
<b>Ecological System(s):</b>	East Gulf Coastal Plain Small Stream and River Floodplain Forest (CES203.559) East Gulf Coastal Plain Large River Floodplain Forest (CES203.489) North-Central Interior Floodplain (CES202.694) South-Central Interior Large Floodplain (CES202.705) Western Great Plains Floodplain (CES303.678) Edwards Plateau Riparian [Provisional] (CES303.652) Edwards Plateau Floodplain Terrace [Provisional] (CES303.651)

#### ELEMENT CONCEPT

**Global Summary:** The black willow forest type is found widely but sporadically across the eastern United States. Stands occur on the banks of small to large rivers where they are a component of point bar succession. It may also be present in the inflows of manmade lakes where similar sand bars may develop over time and where the seasonal draining patterns of the lake may mimic similar natural processes. Surface water is present for brief periods during the growing season, but the water table usually lies well below soil surface. The vegetation is a closed-canopy forest dominated by *Salix nigra*. Associates may include *Populus deltoides*, *Planera aquatica*, *Betula nigra*, *Platanus occidentalis*, *Celtis laevigata*, *Fraxinus pennsylvanica*, *Carya illinoensis*, *Diospyros virginiana*, *Quercus nigra*, *Cornus drummondii*, *Ulmus americana*, *Acer rubrum*, *Acer negundo*, and *Acer saccharinum*. Shrubs and herbaceous plants are absent to fairly dense. They include *Ampelopsis arborea*, *Mikania scandens*, *Toxicodendron radicans*, *Polygonum* spp., *Erechtites hieraciifolia*, *Boehmeria cylindrica*, *Commelina virginica*, *Phytolacca americana*, and *Asplenium platyneuron*. In Kentucky, stands may contain *Dichantheium commutatum*.

#### ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:** Palustrine

#### Chickamauga-Chattanooga National Military Park Environment:

**Global Environment:** Stands occur on the banks of small to large rivers where they are a component of point bar succession. Surface water is present for brief periods during the growing season, but the water table usually lies well below soil surface (Central Appalachian Ecoregional Team pers. comm. 1998).

#### VEGETATION DESCRIPTION

#### Chickamauga-Chattanooga National Military Park Vegetation:

**Global Vegetation:** The vegetation is a closed-canopy forest dominated by *Salix nigra*. Associates include *Populus deltoides*, *Planera aquatica*, *Betula nigra*, *Platanus occidentalis*, *Celtis laevigata*, *Fraxinus pennsylvanica*, *Carya illinoensis*, *Diospyros virginiana*, *Quercus nigra*, *Cornus drummondii*, *Ulmus americana*, *Acer rubrum*, *Acer negundo*, and *Acer saccharinum*. Shrubs and herbaceous plants are absent to fairly dense. They include *Ampelopsis arborea*, *Mikania scandens*, *Toxicodendron radicans*, *Polygonum* spp., *Erechtites hieraciifolia*, *Boehmeria cylindrica*, *Commelina virginica*, *Phytolacca americana*, and *Asplenium platyneuron* (Central Appalachian Ecoregional Team pers. comm. 1998).

#### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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**Global**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

#### Chickamauga-Chattanooga National Military Park:

**Global:**

**OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:****Global:****CONSERVATION STATUS RANK**

**Global Rank & Reasons:** G4 (15-Oct-2002). This association is currently broadly described to cover a large geographic range. It occurs sporadically on the banks of small to large rivers. There is a need for further inventory and description of this community to determine its relationship to similar communities, but it is assumed to be under no severe threats and its wide distribution means that it is not a rare community type.

**CLASSIFICATION**

**Status:** Standard

**Classification Confidence:** 3 - Weak

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** This type needs a thorough rangewide assessment to standardize its concept. In Missouri, stands of this nature are included in the *Populus deltoides* - *Salix nigra* Forest (CEGL002018).

**Global Similar Associations:**

*Populus deltoides* - *Salix nigra* Forest (CEGL002018)--overlaps in concept.

*Salix nigra* - (*Fraxinus pennsylvanica*, *Acacia farnesiana*) Forest (CEGL008481)

*Salix nigra* - *Platanus occidentalis* Forest (CEGL004626)

*Salix nigra* Large River Floodplain Forest (CEGL007410)--of larger rivers but (formerly) placed in seasonally flooded.

**Global Related Concepts:****OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION****Chickamauga-Chattanooga National Military Park Range:**

**Global Range:** The black willow forest type is found widely, but sporadically across the eastern United States, ranging from Ohio west to Iowa, south to Arkansas, Louisiana and Texas, east to Florida and North Carolina.

**Nations:** CA, US

**States/Provinces:** AL?, AR, FL, GA, IA, IL?, IN?, KY, LA, MS, NC, OH?, OK?, ON, SC, TN, TX, VA, WV

**USFS Ecoregions:** 221Ec:CPP, 221Ed:CP?, 221Ef:CP?, 221Ha:CCC, 221Hc:CCC, 221He:CCC, 222A:CC, 222Eg:CCC, 222En:CCC, 222Eo:CCC, 231Bc:CCC, 231Ga:CCC, 231Gb:CCC, 232Bq:CCC, 251E:CC, 251F:CC, 255A:CC, 255C:CC, 255D:CC, 311A:CC, 332E:CC, M221Cd:CCC, M222A:CC, M231A:CC

**Federal Lands:** DOD (Arkansas River, Fort Benning); NPS (Chickamauga-Chattanooga?, Fort Donelson, Ninety Six, Stones River); USFS (Bienville?, Conecuh?, Daniel Boone, Nantahala?, Pisgah?, Sumter (Piedmont)?, Talladega, Talladega (Oakmulgee)?, Talladega (Talladega), Tuskegee?)

**ELEMENT SOURCES****Chickamauga-Chattanooga National Military Park Inventory Notes:****Chickamauga-Chattanooga National Military Park Plots:****Local Description Authors:**

**Global Description Authors:** Great Plains Program, mod. D. Faber-Langendoen

**References:** Baalman 1965, Blair 1938, Blair and Hubbell 1938, CAP pers. comm. 1998, Fleming et al. 2001, Hefley 1937, Hoagland 2000, INAI unpubl. data, Johnson 1984, Kelting and Penfound 1950, McCoy 1958,

NatureServe Ecology - Southeastern U.S. unpubl. data, Peet et al. unpubl. data 2002, Penfound 1953, Penfound 1961, Penfound 1965, Petranka and Holland 1980, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

### **Cumberland Plateau Willow Oak Pond**

*Quercus phellos* - *Liquidambar styraciflua* / *Chasmanthium laxum* Cumberland / Southern Ridge and Valley Forest

Willow Oak - Sweetgum / Slender Spikegrass Cumberland / Southern Ridge and Valley Forest

Identifier: CEGL008441

### **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</i> Seasonally Flooded Forest Alliance (A.330)
Alliance (English name)	Willow Oak Seasonally Flooded Forest Alliance
Association	<i>Quercus phellos</i> - <i>Liquidambar styraciflua</i> / <i>Chasmanthium laxum</i> Cumberland /
Southern Ridge	and Valley Forest
Association (English name)	Willow Oak - Sweetgum / Slender Spikegrass Cumberland / Southern Ridge and Valley Forest
Association (Common name)	Cumberland Plateau Willow Oak Pond
<b>Ecological System(s):</b> (CES202.018)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond

### **ELEMENT CONCEPT**

**Global Summary:** This community occupies shallow depressions in ridgetop or plateau-top sandstone of the Cumberland Plateau or on limestones and dolostones in the Southern Ridge and Valley. This association has a closed to open canopy dominated by *Quercus phellos*. In addition, *Liquidambar styraciflua*, *Acer rubrum*, *Nyssa sylvatica*, *Quercus rubra*, and *Pinus taeda* can also be canopy components. Shrubs and woody vines are sparse, and can include *Toxicodendron radicans*, *Cephalanthus occidentalis*, and *Campsis radicans*. Herbs are also sparse. Most characteristic is *Chasmanthium laxum*. Other herbs include *Carex glaucescens*, *Dulichium arundinaceum*, *Dichanthelium* spp., *Rhynchospora corniculata*, *Juncus repens*, and *Chasmanthium sessiliflorum*. *Sphagnum lescurii* and other *Sphagnum* spp. can form scattered patches or fairly continuous cover.

### **ENVIRONMENTAL DESCRIPTION**

**USFWS Wetland System:** Palustrine

**Chickamauga-Chattanooga National Military Park Environment:** Two examples of this plant community occur in association with small depression ponds at Chickamauga Battlefield. The first is located in a flat low ridge, presumably of limestone, well removed from small tributaries of Chickamauga Creek. This small pond (about 12 m in diameter) is flooded from seasonal rainfall and has well-developed mucky soils that typically become dry during the latter part of the growing season. Water depth at maximum is about 60 cm, with three distinct zones of vegetation: a sparse open canopy of hardwoods, an equally open sparse shrub layer, and a dense herbaceous layer along the pond margins. The second example is much larger (about 24 m in diameter) but appears to have a shorter hydroperiod and lacks distinctive zones of vegetation. The shrub layer is largely lacking and the herb layer is patchy and of lower diversity, consisting primarily of sedges.

**Global Environment:** This community occupies shallow depressions in ridgetop or plateau-top sandstone of the Cumberland Plateau or on limestones and dolostones in the Southern Ridge and Valley. Flooding reaches depths of about 0.3-0.6 m (1-2 feet). Flooding commonly extends from mid-winter into mid-spring. These communities are

typically important amphibian breeding sites, since they are fish-free yet are flooded for long enough to allow amphibian egg hatching and maturation of young (in most years).

#### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** One example located at Chickamauga Battlefield has at least three distinctive zones of vegetation: at the margin of the pond, a sparse very open canopy of *Quercus phellos*, *Fraxinus pennsylvanica*, and *Acer rubrum*; this grades inwardly into an equally sparse and open shrub zone dominated by *Ilex decidua*; and finally a dense herb layer surrounding the margin of the pond dominated by *Sparganium americanum* along with other wetland species, including *Carex lupulina*, *Boehmeria cylindrica*, *Eleocharis obtusa*, *Polygonum punctatum*, *Polygonum hydropiperoides*, *Ludwigia palustris*, and *Cardamine pennsylvanica*. A second and much larger example, located near Alexander Bridge, has much lower plant diversity and lacks distinctive zonation. The canopy is very open and dominated by old-growth *Quercus phellos* with lesser amounts of *Pinus taeda* and *Liquidambar styraciflua*. *Fraxinus pennsylvanica* occurs as a minor subcanopy species. The shrub layer is very sparse and consists of scattered *Acer rubrum* and *Rhus copallinum*. The herb layer is patchy, with large clumps of tall sedges including *Carex glaucescens*, *Carex typhina*, *Carex lupulina*, and *Carex intumescens*. Other forbs occur sparsely; *Ludwigia palustris*, *Boehmeria cylindrica*, and *Toxicodendron radicans* were the only other herbaceous species observed here at the time of sampling.

**Global Vegetation:** This association has a closed to open canopy dominated by *Quercus phellos*. In addition, *Liquidambar styraciflua*, *Acer rubrum*, *Nyssa sylvatica*, *Quercus rubra*, and *Pinus taeda* can also be canopy components. Shrubs and woody vines are sparse and may include *Toxicodendron radicans*, *Cephalanthus occidentalis*, and *Campsis radicans*. Herbs are also sparse. Most characteristic is *Chasmanthium laxum*. Other herbs include *Carex glaucescens*, *Dulichium arundinaceum*, *Dichantheium* spp., *Rhynchospora corniculata*, *Juncus repens*, and *Chasmanthium sessiliflorum*. *Sphagnum lescurii* and other *Sphagnum* spp. can form scattered patches or fairly continuous cover.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus phellos</i>
Herb (field)	Graminoid	<i>Carex glaucescens</i>

##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Boehmeria cylindrica*, *Carex glaucescens*, *Fraxinus pennsylvanica*, *Ilex decidua*, *Liquidambar styraciflua*, *Quercus phellos*

**Global:**

#### OTHER NOTEWORTHY SPECIES

**Chickamauga-Chattanooga National Military Park:**

**Global:**

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G3 (14-Aug-2000). This community is naturally rare and occupies very small acreage, yet its ecological significance is disproportionate to area covered, because of significance to amphibian breeding, water source for wildlife species, and contribution to landscape diversity. Oak ponds of this kind are sometimes ditched and drained, and other times deepened to provide a more reliable water source.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:** This occurrence is not typical but best placed here. The substrate is most likely limestone rather than sandstone. Charles Wharton describes other limesink/sagponds from Chickamauga Battlefield.

**Global Comments:** This type is most closely allied to *Quercus phellos* / *Carex (albolutescens, intumescens, jorii)* - *Chasmanthium laxum* / *Sphagnum lescurii* Forest (CEGL007403) of the Piedmont. This type (CEGL008441) seems to be more depauperate. Further comparison and assessment should be made of the similarities of these two types; it may be reasonable to merge them.

**Global Similar Associations:**

*Quercus phellos* / *Carex (albolutescens, intumescens, jorii)* - *Chasmanthium laxum* / *Sphagnum lescurii* Forest (CEGL007403)--is a more species-rich pond forest found in the Piedmont.

**Global Related Concepts:**

**OTHER COMMENTS**

**Other Comments:**

**ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** The smaller occurrence here is not typical but best classified here. The pond located near Alexander Bridge (CHCH.52) is a more typical occurrence. The substrate is limestone rather than sandstone. Charles Wharton describes other limesink/sagponds from Chickamauga Battlefield, in particular Bloody Pond which apparently has been drained and largely altered.

**Global Range:** This association is known from the Southern Ridge and Valley and Cumberland Plateau of Georgia, Alabama, Kentucky, and Tennessee.

**Nations:** US

**States/Provinces:** AL, GA, KY, TN

**USFS Ecoregions:** 221Hc:CCC, 221He:CCP, 231Cd:CCC, 231Dc:CCC, M221Cd:CCC

**Federal Lands:** NPS (Chickamauga-Chattanooga, Shiloh?); USFS (Bankhead, Chattahoochee, Chattahoochee (Southern Blue Ridge), Daniel Boone)

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.03, CHCH.52.

**Local Description Authors:** T. Govus

**Global Description Authors:** A.S. Weakley

**References:** NatureServe Ecology - Southeastern U.S. unpubl. data, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

**Highland Rim Semi-natural Red-cedar - Oak Forest**

*Juniperus virginiana* var. *virginiana* - *Quercus* spp. Forest

Eastern Red-cedar - Oak species Forest

Identifier: CEGL004731

**NVC Classification**

Physiognomic Class	Forest (I)
Physiognomic Subclass	Mixed evergreen-deciduous forest (I.C.)
Physiognomic Group	Mixed needle-leaved evergreen - cold-deciduous forest (I.C.3.)

Physiognomic Subgroup (I.C.3.N.)	Natural/Semi-natural mixed needle-leaved evergreen - cold-deciduous forest
Formation	Mixed needle-leaved evergreen - cold-deciduous forest (I.C.3.N.a.)
Alliance (A.383)	<i>Juniperus virginiana</i> - <i>Quercus</i> ( <i>stellata</i> , <i>velutina</i> , <i>marilandica</i> ) Forest Alliance
Alliance (English name)	Eastern Red-cedar - (Post Oak, Black Oak, Blackjack Oak) Forest Alliance
Association	<i>Juniperus virginiana</i> var. <i>virginiana</i> - <i>Quercus</i> spp. Forest
Association (English name)	Eastern Red-cedar - Oak species Forest
Association (Common name)	Highland Rim Semi-natural Red-cedar - Oak Forest

### Ecological System(s):

#### ELEMENT CONCEPT

**Global Summary:** This is a forest found on the southeastern Highland Rim of Tennessee; it also occurs marginally in the calcareous portions of the Cumberlands/Southern Ridge and Valley. Stands have a dense *Juniperus virginiana* var. *virginiana* canopy, which may also include various *Quercus* spp. (possibly any combination of *Quercus falcata*, *Quercus coccinea*, *Quercus stellata*, *Quercus marilandica*, *Quercus velutina*, *Quercus alba*, *Quercus phellos*, *Quercus nigra*) and *Carya alba*. The canopy/subcanopy may contain *Acer rubrum*, *Cornus florida*, *Oxydendrum arboreum*, *Platanus occidentalis*, *Prunus serotina* var. *serotina*, *Vaccinium arboreum*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, and *Ulmus* sp. The dispersed and patchy shrub layer is often composed of ericaceous shrubs, such as *Vaccinium pallidum* and *Vaccinium stamineum*, but might also include *Viburnum* sp., *Smilax* sp., and *Lonicera japonica*. Sparse herbs include *Botrychium biternatum*, *Chimaphila maculata*, *Packera anonyma* (= *Senecio anonymus*), *Asplenium platyneuron*, *Polystichum acrostichoides*, *Carex* spp., and the exotic grass *Microstegium vimineum*.

#### ENVIRONMENTAL DESCRIPTION

##### USFWS Wetland System:

**Chickamauga-Chattanooga National Military Park Environment:** The example studied occurs on the side of a low calcareous ridge (dolomites and limestones of the Knox and Chickamauga groups) in the central portion of Chickamauga Battlefield. This is a xeric to dry-mesic site, shallow to rock with a southwest exposure. The elevation is 225 m (740 feet).

##### Global Environment:

#### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** This example is strongly dominated by *Juniperus virginiana* var. *virginiana* with lesser amounts of other tree species such as *Prunus serotina*, *Carya caroliniae-septentrionalis*, *Quercus marilandica*, *Quercus falcata*, *Acer rubrum*, *Cornus florida*, and *Cercis canadensis*. The shrub layer is sparse to patchy and dominated by *Frangula caroliniana* and *Rhus aromatica*. The herbaceous layer is patchy to moderately well-developed and fairly diverse. *Carex cherokeensis*, *Salvia urticifolia*, *Manfreda virginica*, *Elephantopus tomentosus*, and *Ruellia caroliniensis* are some of the most prominent species.

**Global Vegetation:** Stands of this forest have a dense *Juniperus virginiana* var. *virginiana* canopy, which may also include various *Quercus* spp. (possibly any combination of *Quercus falcata*, *Quercus coccinea*, *Quercus stellata*, *Quercus marilandica*, *Quercus velutina*, *Quercus alba*, *Quercus phellos*, *Quercus nigra*) and *Carya alba*. The canopy/subcanopy may contain *Acer rubrum*, *Cornus florida*, *Oxydendrum arboreum*, *Platanus occidentalis*, *Prunus serotina* var. *serotina*, *Vaccinium arboreum*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, and *Ulmus* sp. The dispersed and patchy shrub layer is often composed of ericaceous shrubs, such as *Vaccinium pallidum* and *Vaccinium stamineum*, but might also include *Viburnum* sp., *Smilax* sp., and *Lonicera japonica*. Sparse herbs include *Botrychium biternatum*, *Chimaphila maculata*, *Packera anonyma* (= *Senecio anonymus*), *Asplenium platyneuron*, *Polystichum acrostichoides*, *Carex* spp., and the exotic grass *Microstegium vimineum*. Examples in more calcareous sites in the Cumberlands/Southern Ridge and Valley (Chickamauga-Chattanooga National Military Park) may have species more indicative of limestone influence such as *Juglans nigra*, *Morus rubra*, *Frangula caroliniana*, *Rhus aromatica*, and *Salvia urticifolia* and lack an abundance of *Vaccinium* spp.

**MOST ABUNDANT SPECIES****Chickamauga-Chattanooga National Military Park****Stratum**

Tree canopy

**Lifeform**

Needle-leaved tree

**Species***Juniperus virginiana***Global****Stratum****Lifeform****Species****CHARACTERISTIC SPECIES**

**Chickamauga-Chattanooga National Military Park:** *Acer rubrum*, *Carya carolinae-septentrionalis*, *Cercis canadensis*, *Frangula caroliniana*, *Juniperus virginiana*, *Manfreda virginica*, *Quercus falcata*, *Quercus marilandica*, *Rhus aromatica*, *Salvia urticifolia*

**Global:****OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:****Global:****CONSERVATION STATUS RANK**

**Global Rank & Reasons:** GNA (modified/managed) (6-Jun-1997). The wide variety of oak species listed for this association may indicate its (partial) origin as being post-disturbance, or may hint at a range of conditions under which it manifests. Is it successional on abandoned pasture lands, or does it include fire-suppressed oak woodlands?

**CLASSIFICATION****Status:** Standard**Classification Confidence:** 2 - Moderate**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** The wide variety of oak species listed for this association may indicate its (partial) origin as being post-disturbance, or may hint at a range of conditions under which it manifests. Is it successional on abandoned pasture lands, or does it include fire-suppressed oak woodlands? Additional data will be required to determine if it should be subdivided further.

**Global Similar Associations:**

*Quercus stellata* - *Juniperus virginiana* var. *virginiana* Forest (CEGL004935)--of Oklahoma Crosstimbers.

**Global Related Concepts:****OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** To date, this association has only been documented on Chickamauga Battlefield; it could potentially occur on Lookout Mountain.

**Global Range:** This forest is found on the southeastern Highland Rim of Tennessee. It is also occurs marginally in the calcareous portions of the Cumberlands/Southern Ridge and Valley.

**Nations:** US**States/Provinces:** AL?, GA, KY?, TN**USFS Ecoregions:** 221H:P?, 221J:PP, 222Eb:CCC, 231C:P?, 231D:PP**Federal Lands:** DOD (Arnold); NPS (Chickamauga-Chattanooga); USFS (Daniel Boone?)

## ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.07.

**Local Description Authors:** T. Govus

**Global Description Authors:** M.J. Russo, mod. T. Govus

**References:** Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, TNC 1998a

**Southern Blue Ridge Escarpment Shortleaf Pine - Oak Forest**

*Pinus echinata* - *Quercus* (*prinus*, *falcata*) / *Oxydendrum arboreum* / *Vaccinium pallidum* Forest

Shortleaf Pine - (Chestnut Oak, Southern Red Oak) / Sourwood / Hillside Blueberry Forest

Identifier: CEGL007493

**NVC Classification**

Physiognomic Class	Forest (I)
Physiognomic Subclass	Mixed evergreen-deciduous forest (I.C.)
Physiognomic Group	Mixed needle-leaved evergreen - cold-deciduous forest (I.C.3.)
Physiognomic Subgroup (I.C.3.N.)	Natural/Semi-natural mixed needle-leaved evergreen - cold-deciduous forest
Formation	Mixed needle-leaved evergreen - cold-deciduous forest (I.C.3.N.a.)
Alliance	<i>Pinus echinata</i> - <i>Quercus</i> ( <i>coccinea</i> , <i>prinus</i> ) Forest Alliance (A.395)
Alliance (English name)	Shortleaf Pine - (Scarlet Oak, Chestnut Oak) Forest Alliance
Association	<i>Pinus echinata</i> - <i>Quercus</i> ( <i>prinus</i> , <i>falcata</i> ) / <i>Oxydendrum arboreum</i> / <i>Vaccinium pallidum</i> Forest
Association (English name)	Shortleaf Pine - (Chestnut Oak, Southern Red Oak) / Sourwood / Hillside Blueberry Forest
Association (Common name)	Southern Blue Ridge Escarpment Shortleaf Pine - Oak Forest

**Ecological System(s):** Southern Appalachian Low-Elevation Pine Forest (CES202.332)

## ELEMENT CONCEPT

**Global Summary:** This association includes crests of low-elevation slopes and ridges on the fringes of the Southern Blue Ridge, extending into the southern Ridge and Valley and Cumberland Plateau, where *Pinus echinata* and dry-site oaks characteristic of lower elevations codominate in association with other Appalachian flora. This forest is known from the southern Blue Ridge Escarpment of North Carolina, South Carolina, and Georgia, particularly in the Blue Ridge/Piedmont transition, where it occurs on exposed, rocky ridges and upper, convex slopes, at elevations at or below 670 m (2200 feet). It also extends into the southern Ridge and Valley and Cumberland Plateau, but more information is needed to characterize the variation in that part of the range. This community may occur in slightly more protected situations in the hotter Piedmont ecoregion. Canopies are codominated by *Pinus echinata* and combinations of dry-site oaks that may include *Quercus falcata*, *Quercus coccinea*, *Quercus prinus*, *Quercus stellata*, and *Quercus velutina*. On rocky sites, canopies may be slightly stunted. Mid-canopy trees can be scattered or form a well-developed subcanopy. Common subcanopy trees can include *Oxydendrum arboreum*, *Ilex opaca* var. *opaca*, *Cornus florida*, *Quercus marilandica*, *Quercus stellata*, and *Carya pallida*. The shrub stratum varies in composition and density but is typically dominated by *Vaccinium pallidum*. Other shrubs may include *Vaccinium stamineum*, *Gaylussacia ursina*, *Gaylussacia baccata*, *Rhododendron calendulaceum*, *Rhododendron minus*, *Castanea pumila*, and *Kalmia latifolia*. On some sites *Symplocos tinctoria* can be important. *Vitis rotundifolia* and *Smilax glauca* are common vines. The herb stratum is poorly developed with scattered species such as *Chimaphila maculata*, *Iris verna*, *Pteridium aquilinum* var. *latiusculum*, *Goodyera pubescens*, *Hexastylis arifolia*, *Coreopsis major* (= var. *rigida*), *Tipularia discolor*, *Schizachyrium scoparium*, *Pityopsis graminifolia* var. *latifolia*, *Tephrosia virginiana*, *Silphium compositum*, *Dichantheium* spp., and *Galax urceolata*.

## ENVIRONMENTAL DESCRIPTION

### USFWS Wetland System:

**Chickamauga-Chattanooga National Military Park Environment:** The example studied occurs on the high slopes and crests of sandstone ridges along the western side of Chickamauga Battlefield. These slopes have a western aspect and are judged to be xeric with thin, well-drained cherty soils. Elevations range from about 300 to 305 m (980-1000 feet).

**Global Environment:** This association includes crests of low-elevation slopes and ridges on the fringes of the Southern Blue Ridge, extending into the southern Ridge and Valley and Cumberland Plateau, where *Pinus echinata* and dry-site oaks characteristic of lower elevations codominate in association with other Appalachian flora. This forest is known from the southern Blue Ridge Escarpment region of North Carolina, South Carolina, and Georgia, particularly in the Blue Ridge/Piedmont transition, where it occurs on exposed, rocky ridges and upper, convex slopes, at elevations at or below 670 m (2200 feet). It also extends into the southern Ridge and Valley and Cumberland Plateau, but more information is needed to characterize the variation in that part of the range.

## VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** This association has a mixed canopy of evergreen and deciduous species with nearly equal amounts of *Pinus echinata*, *Quercus velutina*, and *Quercus falcata*. Subcanopy and understory species present include *Oxydendrum arboreum*, *Cornus florida*, *Quercus marilandica*, *Quercus stellata*, *Carya glabra*, and *Nyssa sylvatica*. The shrub layer is mostly dominated by transgressive hardwoods from the canopy layer but also include *Vaccinium pallidum*, *Frangula caroliniana*, and *Sassafras albidum*. The herbaceous layers is very sparse (less than 5% of ground cover). Frequently occurring species here are *Coreopsis major*, *Carex nigromarginata*, *Uvularia sessilifolia*, *Desmodium nudiflorum*, *Euphorbia pubentissima*, *Aristolochia serpentaria*, *Solidago odora*, and *Galium circaezans*. *Vitis rotundifolia* and *Smilax glauca* are common vines.

**Global Vegetation:** Canopies are codominated by *Pinus echinata* and combinations of dry-site oaks that may include *Quercus falcata*, *Quercus coccinea*, *Quercus prinus*, *Quercus stellata*, and *Quercus velutina*. On rocky sites, canopies may be slightly stunted. Mid-canopy trees can be scattered or form a well-developed subcanopy. Common subcanopy trees can include *Oxydendrum arboreum*, *Ilex opaca* var. *opaca*, *Cornus florida*, *Quercus marilandica*, *Quercus stellata*, and *Carya pallida*. The shrub stratum varies in composition and density but is typically dominated by *Vaccinium pallidum*. Other shrubs may include *Vaccinium stamineum*, *Gaylussacia ursina*, *Gaylussacia baccata*, *Rhododendron calendulaceum*, *Rhododendron minus*, *Castanea pumila*, and *Kalmia latifolia*. On some sites *Symplocos tinctoria* can be important. *Vitis rotundifolia* and *Smilax glauca* are common vines. The herb stratum is poorly developed with scattered species such as *Chimaphila maculata*, *Iris verna*, *Pteridium aquilinum* var. *latiusculum*, *Goodyera pubescens*, *Hexastylis arifolia*, *Coreopsis major* (= var. *rigida*), *Tipularia discolor*, *Schizachyrium scoparium*, *Pityopsis graminifolia* var. *latifolia*, *Tephrosia virginiana*, *Silphium compositum*, *Dichanthelium* spp., and *Galax urceolata*.

## MOST ABUNDANT SPECIES

### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tree canopy	Needle-leaved tree	<i>Pinus echinata</i>
Tree canopy	Broad-leaved deciduous tree	<i>Quercus falcata</i> , <i>Quercus velutina</i>
Short shrub/sapling	Broad-leaved deciduous shrub	<i>Vaccinium pallidum</i>

### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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## CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Carya glabra*, *Coreopsis major*, *Cornus florida*, *Euphorbia pubentissima*, *Oxydendrum arboreum*, *Pinus echinata*, *Quercus falcata*, *Quercus marilandica*, *Quercus stellata*, *Quercus velutina*, *Solidago odora*, *Uvularia sessilifolia*, *Vaccinium pallidum*

### Global:

**OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:****Global:****CONSERVATION STATUS RANK**

**Global Rank & Reasons:** G3G4 (12-Jan-2000). This community occurs within a restricted geographic range and is uncommon within this range. Because this community is poorly known and essentially uninventoried throughout its range, there remain questions regarding its taxonomic distinctiveness and geographic extent. Further inventory and more detailed field information may expand the current range and concept of this type.

**CLASSIFICATION**

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** These communities are distinguished by canopies codominated by *Pinus echinata* and combinations of dry-site oaks that may include *Quercus falcata*, *Quercus coccinea*, *Quercus prinus*, *Quercus stellata*, and *Quercus velutina*. These communities are not well known. In North Carolina they are apparently largely confined to Cherokee County. Examples are also known from the southern portion of the Chattooga River Basin watershed in South Carolina and Georgia. This forest is probably fire-dependent to some extent, and fire (prescribed or natural) will stimulate regeneration of *Pinus echinata*. Many occurrences of this community are highly disturbed and contain exotic species such as *Ligustrum japonicum*, *Dioscorea oppositifolia*, and *Lonicera japonica*. *Pinus echinata*, in many occurrences, has been attacked by the Southern Pine Bark Beetle, which will eventually kill the trees. The concepts of the former associations *Pinus echinata* - *Quercus falcata* / *Vaccinium pallidum* Forest (CEGL007494) and *Pinus echinata* - *Quercus prinus* / *Oxydendrum arboreum* / *Vaccinium pallidum* Forest (CEGL007495) were merged into this association and should be considered variants of this community. *Pinus echinata* - *Quercus alba* / *Vaccinium pallidum* / *Hexastylis arifolia* - *Chimaphila maculata* Forest (CEGL008427) includes shortleaf pine - mesic oak forests of the non-coastal plain, non-Ozark/Ouachita portion of the *Pinus echinata* range, with an overall more mesophytic species composition than the association described here.

**Global Similar Associations:**

*Pinus echinata* - *Quercus alba* / *Vaccinium pallidum* / *Hexastylis arifolia* - *Chimaphila maculata* Forest (CEGL008427)

*Pinus echinata* - *Quercus prinus* / *Rhododendron minus* / *Vaccinium pallidum* Forest (CEGL007496)

*Pinus echinata* - *Quercus stellata* - *Quercus marilandica* / *Vaccinium pallidum* Woodland (CEGL003765)

*Pinus echinata* - *Quercus stellata* - *Quercus prinus* - *Carya glabra* / (*Danthonia spicata*, *Piptochaetium avenaceum*) Forest (CEGL007500)--a more open, grassy variant.

**Global Related Concepts:**

IA7a. Xeric Shortleaf Pine - Oak Forest (Allard 1990) B

Southern Mountain Pine-Oak Forest (Schafale 1998b) ?

**OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This association is apparently restricted to the western portion of Chickamauga Battlefield.

**Global Range:** This association occurs in the southern fringes of the Southern Blue Ridge, extending into the southern Ridge and Valley and Cumberland Plateau. It could possibly range into the upper Piedmont.

**Nations:** US

**States/Provinces:** AL?, GA, KY, NC, SC, TN?

**USFS Ecoregions:** 221Hc:CCC, 231Ae:CCP, 231Ag:CCC, 231Dc:CCC, M221Cd:CCC, M221Dc:CCC, M221Dd:CCC

**Federal Lands:** NPS (Big South Fork, Blue Ridge Parkway?, Chickamauga-Chattanooga, Great Smoky Mountains, Kings Mountain, Little River Canyon?, Obed?); USFS (Chattahoochee, Chattahoochee (Piedmont)?, Chattahoochee (Southern Blue Ridge), Cherokee?, Daniel Boone, Nantahala, Sumter, Sumter (Mountains), Sumter (Piedmont)?)

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.22.

**Local Description Authors:** T. Govus

**Global Description Authors:** K.D. Patterson

**References:** Allard 1990, Evans 1991, NatureServe Ecology - Southeastern U.S. unpubl. data, Peet et al. unpubl. data 2002, Schafale 1998b, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

### Chinese Privet Upland Shrubland

*Ligustrum sinense* Upland Shrubland

Identifier: CEGL003807

#### NVC Classification

Physiognomic Class	Shrubland (III)
Physiognomic Subclass	Evergreen shrubland (III.A.)
Physiognomic Group	Temperate broad-leaved evergreen shrubland (III.A.2.)
Physiognomic Subgroup	Natural/Semi-natural temperate broad-leaved evergreen shrubland (III.A.2.N.)
Formation	Temperate broad-leaved evergreen shrubland (III.A.2.N.a.)
Alliance	<i>Ligustrum sinense</i> Shrubland Alliance (A.738)
Alliance (English name)	Chinese Privet Shrubland Alliance
Association	<i>Ligustrum sinense</i> Upland Shrubland
Association (English name)	Chinese Privet Upland Shrubland

#### Ecological System(s):

#### ELEMENT CONCEPT

**Global Summary:** This shrubland association comprises upland and wetland areas heavily infested with the exotic *Ligustrum sinense* to the exclusion of canopy trees.

#### ENVIRONMENTAL DESCRIPTION

##### USFWS Wetland System:

##### Chickamauga-Chattanooga National Military Park Environment:

**Global Environment:** This community exists in disturbed bottomlands and uplands, usually highly fragmented, where they can establish and exclude almost all native species.

#### VEGETATION DESCRIPTION

##### Chickamauga-Chattanooga National Military Park Vegetation:

**Global Vegetation:** This community is usually a monoculture of *Ligustrum sinense*.

**MOST ABUNDANT SPECIES****Chickamauga-Chattanooga National Military Park**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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Global

Stratum

Shrub/sapling (tall &amp; short)

Lifeform*Ligustrum sinense*Species**CHARACTERISTIC SPECIES****Chickamauga-Chattanooga National Military Park:**

Global:

**OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:**

Global:

**CONSERVATION STATUS RANK**

Global Rank &amp; Reasons: GNA (invasive) (1-Dec-1997).

**CLASSIFICATION**

Status: Standard

Classification Confidence: 3 - Weak

**Chickamauga-Chattanooga National Military Park Comments:**

Global Comments:

Global Similar Associations:

Global Related Concepts:

**OTHER COMMENTS**

Other Comments:

**ELEMENT DISTRIBUTION****Chickamauga-Chattanooga National Military Park Range:**

Global Range: This invasive community is found throughout the southeastern United States from Virginia to Florida and west to Arkansas and Louisiana.

Nations: US

States/Provinces: AL, AR, FL, GA, LA, MS, NC?, SC, TN, VA

USFS Ecoregions: 221:C, 222E:CC, 231Aa:CCC, 231Cg:CCC, 231Ga:CCC, 231Gc:CCC, 232:C, 234A:CC, M231:C

Federal Lands: DOD (Fort Benning); NPS (Chickamauga-Chattanooga?, Little River Canyon, Ninety Six, Stones River)

**ELEMENT SOURCES****Chickamauga-Chattanooga National Military Park Inventory Notes:****Chickamauga-Chattanooga National Military Park Plots:**

Local Description Authors:

Global Description Authors: A.S. Weakley

**References:** Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

### **Golden Bamboo Shrubland**

*Phyllostachys aurea* Shrubland

Golden Bamboo Shrubland

Identifier: CEGL008560

### **NVC Classification**

Physiognomic Class	Shrubland (III)
Physiognomic Subclass	Evergreen shrubland (III.A.)
Physiognomic Group	Temperate broad-leaved evergreen shrubland (III.A.2.)
Physiognomic Subgroup	Natural/Semi-natural temperate broad-leaved evergreen shrubland (III.A.2.N.)
Formation	Temperate broad-leaved evergreen shrubland with a sparse cold-deciduous tree layer (III.A.2.N.f.)
Alliance	<i>Phyllostachys aurea</i> Shrubland Alliance (A.2010)
Alliance (English name)	Golden Bamboo Shrubland Alliance
Association	<i>Phyllostachys aurea</i> Shrubland
Association (English name)	Golden Bamboo Shrubland
Association (Common name)	Golden Bamboo Shrubland

### **Ecological System(s):**

#### **ELEMENT CONCEPT**

**Global Summary:** This community is comprised of uplands dominated by the exotic *Phyllostachys aurea*.

#### **ENVIRONMENTAL DESCRIPTION**

#### **USFWS Wetland System:**

#### **Chickamauga-Chattanooga National Military Park Environment:**

**Global Environment:** This association is found on disturbed lands, often near creeks and other mesic areas.

#### **VEGETATION DESCRIPTION**

#### **Chickamauga-Chattanooga National Military Park Vegetation:**

**Global Vegetation:** This shrubland is usually a monoculture of *Phyllostachys aurea* with little light or resources reaching the understory.

#### **MOST ABUNDANT SPECIES**

#### **Chickamauga-Chattanooga National Military Park**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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Tall shrub/sapling	<i>Phyllostachys aurea</i>	
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#### **CHARACTERISTIC SPECIES**

#### **Chickamauga-Chattanooga National Military Park:**

Global:

#### **OTHER NOTEWORTHY SPECIES**

#### **Chickamauga-Chattanooga National Military Park:**

**Global:****CONSERVATION STATUS RANK**

**Global Rank & Reasons:** GNA (invasive) (3-Oct-2001). This shrubland represents vegetation dominated by an invasive exotic and thus does not receive a conservation status rank.

**CLASSIFICATION**

**Status:** Standard

**Classification Confidence:** 1 - Strong

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:**

**Global Similar Associations:**

**Global Related Concepts:**

**OTHER COMMENTS**

**Other Comments:**

**ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:**

**Global Range:** This vegetation is possible throughout the southeastern United States.

**Nations:** US

**States/Provinces:** AL?, AR?, FL, GA, LA?, MS?, NC?, SC, TN, TX, VA?

**USFS Ecoregions:** 231Ae:CCC, 231F:CP, 232B:CC, 232E:CP, 255D:PP

**Federal Lands:** NPS (Chickamauga-Chattanooga?, Cowpens, Kings Mountain?, Ninety Six, Vicksburg?)

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:**

**Local Description Authors:**

**Global Description Authors:** R. White

**References:** NatureServe Ecology - Southeastern U.S. unpubl. data, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

**Floodplain Canebrake**

*Arundinaria gigantea* ssp. *gigantea* Shrubland

Giant Cane Shrubland

Identifier: CEGL003836

**NVC Classification**

Physiognomic Class	Shrubland (III)
Physiognomic Subclass	Evergreen shrubland (III.A.)
Physiognomic Group	Temperate broad-leaved evergreen shrubland (III.A.2.)
Physiognomic Subgroup	Natural/Semi-natural temperate broad-leaved evergreen shrubland (III.A.2.N.)
Formation	Temporarily flooded temperate broad-leaved evergreen shrubland (III.A.2.N.g.)
Alliance	<i>Arundinaria gigantea</i> Temporarily Flooded Shrubland Alliance (A.795)

Alliance (English name)	Giant Cane Temporarily Flooded Shrubland Alliance
Association	<i>Arundinaria gigantea</i> ssp. <i>gigantea</i> Shrubland
Association (English name)	Giant Cane Shrubland
Association (Common name)	Floodplain Canebrake
<b>Ecological System(s):</b>	Central Appalachian Floodplain (CES202.608)
(CES203.304)	Atlantic Coastal Plain Nonriverine Swamp and Wet Hardwood Forest
	Mississippi River Riparian Forest (CES203.190)
	South-Central Interior Large Floodplain (CES202.705)
	South-Central Interior Small Stream and Riparian (CES202.706)
	Atlantic Coastal Plain Large River Floodplain Forest (CES203.066)
	Mississippi River High Floodplain (Bottomland) Forest (CES203.196)

### ELEMENT CONCEPT

**Global Summary:** This association is characterized by dense, often monospecific thickets of the bamboo shrub *Arundinaria gigantea* occupying large areas referred to as canebrakes. The canebrake shrubland type was historically widespread, but is now rare and occupies very little of its former acreage. It was best developed in streamside flats and alluvial floodplains on ridges and terraces where it was protected from prolonged inundation. Historically, this community covered large areas of many floodplains and streamside flats in the Coastal Plain from North Carolina to Texas, Mississippi River Alluvial Plain, Interior Highlands, Interior Low Plateau, Southern Blue Ridge and possibly the Central Appalachians of the southeastern United States. Stands occur on alluvial and loess soils and are often associated with bottomland hardwood forest vegetation. This association is successional and is thought to be maintained by periodic fires. It may have originated following abandonment of aboriginal agricultural fields or other natural and anthropogenic disturbances such as blow-downs and catastrophic floods. Historical accounts report cane as abundant along the Wabash and Ohio drainage systems, as well as common along larger rivers (Buffalo, White, Norfork) in the Ozarks and Ouachitas. It was also reported as common along the Red and Mississippi rivers in Louisiana, Coastal Prairie rivers in Texas, and the Black, Washita, Arkansas, Sabine, Pearl, Tombigbee, Yazoo, Savannah, and St. Mary's rivers. Large, extant canebrakes still exist and have been documented from the Ocmulgee Basin, south of Macon, Georgia. In the Central Appalachians various wetlands, including those on alluvial or loess substrates (streamside flats, bottomlands), were dominated by *Arundinaria*, without an overstory, or with widely scattered trees.

### ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:** Palustrine

**Chickamauga-Chattanooga National Military Park Environment:**

**Global Environment:** Stands of this association occur on alluvial and loess soils often affiliated with bottomland hardwood forest vegetation. Historically, it was best developed in streamside flats and alluvial floodplains on ridges and terraces where it was protected from prolonged inundation.

### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:**

**Global Vegetation:** The vegetation is dominated by *Arundinaria gigantea*. Little else is known about its vegetational characteristics. However, information on its historic patterns of distribution provides some clues as to its ecology. General Land Office surveys and other historical accounts indicate that canebrakes were present in southern Illinois, southern Indiana, Kentucky, Missouri, Arkansas, eastern Texas, Louisiana, Tennessee, Mississippi, Alabama, Georgia, and South Carolina. Historical accounts refer to both "pure" stands of cane without an overstory of trees (cane shrublands) and areas with variable overstory closure (woodlands or forests) but with a dense understory dominated by cane as "canebrakes." As currently described, this association refers only to the former, cane shrublands. Cane was abundant along the Wabash and Ohio drainage systems (B. McClain pers. comm. 2000). In Missouri, these canebrakes were also thought to be common in the Ozark Highlands, particularly in southward-draining rivers and streams with finer-textured, more developed soils on upper floodplain terraces (T. Nigh pers. comm. 2000). Stands may be found along larger rivers (Buffalo, White, Norfork) in the Arkansas Ozarks in addition to the Ouachitas. In the Central Appalachians various wetlands, including those on alluvial or loess substrates (streamside flats, bottomlands), were dominated by *Arundinaria*, without an overstory, or with widely scattered trees

(Central Appalachian Forest Ecoregional Team pers. comm. 1998). Historic accounts describe large expanses (one area was described as 75 miles long by 1-3 miles wide) of an "ocean of cane" in bottomlands of the Coastal Prairie of Texas (Smeins et al. 1992). No extant occurrences of this vegetation are known from this area today.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

###### Stratum

###### Lifeform

###### Species

###### Global

###### Stratum

Tall shrub/sapling

###### Lifeform

Graminoid

###### Species

*Arundinaria gigantea*

#### CHARACTERISTIC SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:** *Arundinaria gigantea*

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:** *Limnolypis swainsonii*, *Vermivora bachmanii*

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G2? (15-Feb-1999). Stands of this vegetation type were historically widespread, but now are rare or occupy very little acreage. It is thought to be maintained by frequent fire and may have historically resulted from aboriginal agriculture and burning. Dense, monospecific stands of *Arundinaria gigantea ssp. gigantea* were historically found in bottomland sites throughout the southeastern United States. Today, this vegetation exists as small remnants, and high-quality examples are extremely rare.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

##### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** This is a general placeholder, covering a broad geographic range, and several associations may ultimately be recognized. Dense, monospecific stands of *Arundinaria gigantea ssp. gigantea* were historically found in bottomland sites in the southeastern United States. Today, high-quality examples are extremely rare, if not absent. Historical accounts refer to both "pure" stands of cane without an overstory of trees (cane shrublands) and areas with variable overstory closure (woodlands or forests) but with a dense understory dominated by cane as "canebrakes." As currently described, this association refers only to the former, cane shrublands.

##### Global Similar Associations:

##### Global Related Concepts:

P5A4bIII4a. *Arundinaria gigantea* (Foti et al. 1994) ?

Piedmont/Mountain Canebrake (Schafale 1998b) ?

#### OTHER COMMENTS

##### Other Comments:

#### ELEMENT DISTRIBUTION

##### Chickamauga-Chattanooga National Military Park Range:

**Global Range:** This association was widespread historically but now occupies very little acreage. It may be found along rivers and streamsides in Alabama, Arkansas, Florida, Georgia, Illinois, Indiana, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and possibly Virginia (?).

**Nations:** US

**States/Provinces:** AL, AR, FL?, GA, IL, KY, LA, MO, MS, NC, OK, SC, TN, TX, VA?

**USFS Ecoregions:** 221Ha:CC?, 221Hc:CCP, 221Hd:CCP, 221He:CC?, 221Ja:CCC, 221Jb:CCP, 221Jc:CCP, 222Ab:CCC, 222Ag:CCC, 222Ah:CCC, 222An:CCC, 222Ca:CCP, 222Cb:CCP, 222Cc:CCP, 222Cd:CCP, 222Ce:CCP, 222Cf:CCP, 222Cg:CCP, 222Ch:CCP, 222Da:CCP, 222Db:CCP, 222Dc:CCP, 222Dd:CCP, 222De:CCP, 222Dg:CCP, 222Di:CCP, 222Dj:CCP, 222Ea:CCC, 222Eb:CCC, 222Ec:CCC, 222Ed:CCC, 222Ef:CCP, 222Eg:CCP, 222Eh:CCC, 222Ei:CCP, 222Ej:CC?, 222Ek:CCP, 222El:CCP, 222Em:CCP, 222En:CC?, 222Eo:CC?, 222Fa:CCC, 222Fb:CCC, 222Fc:CCC, 222Fd:CCC, 222Ff:CC?, 231Aa:CCP, 231Ab:CC?, 231Ac:CCP, 231Ad:CCP, 231Ae:CCP, 231Af:CCP, 231Ag:CC?, 231Ah:CC?, 231Ai:CCP, 231Am:CC?, 231An:CC?, 231Ao:CCP, 231Ba:CCP, 231Bb:CCP, 231Bc:CCP, 231Bd:CCP, 231Be:CCP, 231Bf:CCP, 231Bg:CCP, 231Bh:CCP, 231Bi:CCP, 231Bj:CCP, 231Bk:CCP, 231Bl:CCP, 231Ca:CCP, 231Cb:CCP, 231Cc:CCP, 231Cd:CCP, 231Ce:CCP, 231Cf:CCP, 231Cg:CCP, 231Da:CCP, 231Db:CCP, 231Dc:CCP, 231Dd:CCP, 231De:CCP, 231Ea:CCP, 231Eb:CCP, 231Ec:CCC, 231Ed:CCC, 231Ee:CCP, 231Ej:CCP, 231Ek:CCP, 231Em:CCC, 231Ga:CCC, 231Gb:CCC, 231Gc:CCC, 234Aa:CCC, 234Ab:CC?, 234Ac:CCP, 234Ad:CCP, 234Ae:CCC, 234Af:CCP, 234Ag:CCC, 234Ah:CC?, 234Ai:CCC, 234Aj:CC?, 234Ak:CC?, 234Al:CCP, 234Am:CCC, 234An:CCC, 255Da:PPP, 255Db:PPP, M221Dc:CCC, M221Dd:CCC, M222Aa:CCC, M222Ab:CCC, M231Aa:CCC, M231Ab:CCC, M231Ac:CCC, M231Ad:CCC

**Federal Lands:** NPS (Blue Ridge Parkway?, Buffalo River, Chickamauga-Chattanooga?, Cowpens, Great Smoky Mountains, Ninety Six, Ozark); USFS (Cherokee?, Mark Twain, Ouachita (Coastal Plain)?, Ouachita (Mountains)?, Ouachita?, Ozark, St. Francis); USFWS (Little River, San Bernard?)

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:**

**Local Description Authors:**

**Global Description Authors:** K.D. Patterson, mod. D. Faber-Langendoen, mod. J. Teague

**References:** Barden 1997, Blair 1938, CAP pers. comm. 1998, Campbell 1980, Campbell 1989b, Davidson 1950, Flores 1984, Foti et al. 1994, Heineke 1987, Hoagland 1997, Hoagland 1998c, Hoagland 2000, Hughes 1966, McClain pers. comm., McInteer 1952, Meanley 1972, Mohr 1901, Nigh pers. comm., Nuttall 1821, Peet et al. unpubl. data 2002, Platt and Brantley 1992, Platt and Brantley 1997, Schafale 1998b, Schafale 2002, Schotz pers. comm., Smeins et al. 1992, Southeastern Ecology Working Group n.d., TDNH unpubl. data, West 1934

### Chinese Privet Temporarily Flooded Shrubland

*Ligustrum sinense* Temporarily Flooded Shrubland

Chinese Privet Temporarily Flooded Shrubland

Identifier: CEGL003837

#### NVC Classification

Physiognomic Class	Shrubland (III)
Physiognomic Subclass	Evergreen shrubland (III.A.)
Physiognomic Group	Temperate broad-leaved evergreen shrubland (III.A.2.)
Physiognomic Subgroup	Natural/Semi-natural temperate broad-leaved evergreen shrubland (III.A.2.N.)
Formation	Temporarily flooded temperate broad-leaved evergreen shrubland (III.A.2.N.g.)
Alliance	<i>Ligustrum sinense</i> Temporarily Flooded Shrubland Alliance (A.796)
Alliance (English name)	Chinese Privet Temporarily Flooded Shrubland Alliance
Association	<i>Ligustrum sinense</i> Temporarily Flooded Shrubland
Association (English name)	Chinese Privet Temporarily Flooded Shrubland
Association (Common name)	Chinese Privet Temporarily Flooded Shrubland

**Ecological System(s):**

**ELEMENT CONCEPT**

**Global Summary:** This association comprises wetland bottomlands heavily infested with the exotic *Ligustrum sinense*.

**ENVIRONMENTAL DESCRIPTION**

**USFWS Wetland System:** Palustrine

**Chickamauga-Chattanooga National Military Park Environment:**

**Global Environment:**

**VEGETATION DESCRIPTION**

**Chickamauga-Chattanooga National Military Park Vegetation:**

**Global Vegetation:**

**MOST ABUNDANT SPECIES**

**Chickamauga-Chattanooga National Military Park**

**Stratum**

**Lifeform**

**Species**

**Global**

**Stratum**

**Lifeform**

**Species**

Shrub/sapling (tall & short) Broad-leaved evergreen shrub

*Ligustrum sinense*

**CHARACTERISTIC SPECIES**

**Chickamauga-Chattanooga National Military Park:**

**Global:**

**OTHER NOTEWORTHY SPECIES**

**Chickamauga-Chattanooga National Military Park:**

**Global:**

**CONSERVATION STATUS RANK**

**Global Rank & Reasons:** GNA (invasive) (8-Aug-2000). This shrubland represents vegetation dominated by an invasive exotic and thus does not receive a conservation status rank.

**CLASSIFICATION**

**Status:** Standard

**Classification Confidence:** 1 - Strong

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:**

**Global Similar Associations:**

**Global Related Concepts:**

**OTHER COMMENTS**

**Other Comments:**

**ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:**

**Global Range:** This vegetation is possible throughout the southeastern United States.

**Nations:** US

**States/Provinces:** AL, AR, FL, GA, LA, MS, NC, SC, TN, VA

**USFS Ecoregions:** 221:C, 222E:CC, 231Ga:CCC, 231Gc:CCC, 232:C, 234A:CC, M231:C

**Federal Lands:** NPS (Chickamauga-Chattanooga?, Stones River); USFS (Ouachita (Mountains)?, Ouachita?)

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:**

**Local Description Authors:**

**Global Description Authors:** A.S. Weakley

**References:** Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

### Kudzu Vineland

*Pueraria montana* var. *lobata* Vine-Shrubland

Kudzu Vine-Shrubland

Identifier: CEGL003882

### 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	Temperate cold-deciduous shrubland (III.B.2.N.a.)
Alliance	<i>Pueraria montana</i> Vine-Shrubland Alliance (A.904)
Alliance (English name)	Kudzu Vine-Shrubland Alliance
Association	<i>Pueraria montana</i> var. <i>lobata</i> Vine-Shrubland
Association (English name)	Kudzu Vine-Shrubland
Association (Common name)	Kudzu Vineland

**Ecological System(s):**

#### ELEMENT CONCEPT

**Global Summary:** This vine-dominated vegetation is dominated by *Pueraria montana* var. *lobata*, a fast-growing vine native to Asia. The species was introduced into the United States in 1885, primarily as an ornamental and as a potential source for cattle forage. It was subsequently widely used for erosion control in the southeastern United States. This association occupies a variety of sites throughout most physiographic provinces in the Southeast, ranging in size from less than a hectare to 5-10 hectares or more. It chokes out existing vegetation. Edges of examples of this vegetation may consist of small to large trees in the process of being overwhelmed by kudzu. More than 2 million acres of forest land in Alabama, Georgia, Mississippi, Tennessee, North Carolina, and South Carolina are estimated to be infested with kudzu. This association is also known to occur north to central Kentucky, Virginia, and Maryland, and as far west as eastern Texas and Oklahoma.

#### ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:**

**Chickamauga-Chattanooga National Military Park Environment:**

**Global Environment:** The association occupies a variety of sites throughout most physiographic provinces in the southeastern U.S., with examples ranging in size from less than one hectare to 5-10 hectares or more. It occurs on disturbed sites, including abandoned town sites and mine lands and on landslides. It chokes out existing vegetation. Edges of examples of this vegetation may consist of small to large trees in the process of being overwhelmed by

kudzu. In West Virginia, *Pueraria montana* var. *lobata* may be limited in its ability to spread due to relatively cold climate.

#### VEGETATION DESCRIPTION

##### Chickamauga-Chattanooga National Military Park Vegetation:

**Global Vegetation:** This vine-dominated vegetation is dominated by *Pueraria montana* var. *lobata*, a fast-growing vine native to Asia.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
<b>Global</b>		
<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Shrub/sapling (tall & short)	Vine/Liana	<i>Pueraria montana</i> var. <i>lobata</i>

#### CHARACTERISTIC SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:** *Pueraria montana* var. *lobata*

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:**

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** GNA (invasive) (24-May-2000). This vegetation is dominated by an exotic species, is of anthropogenic origin, and is thus not a conservation priority. *Pueraria montana* var. *lobata*, native to Asia, was introduced into the United States in 1885, primarily as an ornamental and as a potential source for cattle forage. More than 2 million acres of forest land in Alabama, Georgia, Mississippi, Tennessee, North Carolina, and South Carolina are estimated to be infested with kudzu.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

##### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** *Pueraria montana* var. *lobata*, native to Asia, was introduced into the United States in 1885, primarily as an ornamental and as a potential source for cattle forage. More than 2 million acres of forest land in Alabama, Georgia, Mississippi, Tennessee, North Carolina, and South Carolina are estimated to be infested with kudzu.

##### Global Similar Associations:

*Wisteria sinensis* Vine-Shrubland (CEGL008568)

##### Global Related Concepts:

Kudzu thicket (CAP pers. comm. 1998) ?

#### OTHER COMMENTS

**Other Comments:**

#### ELEMENT DISTRIBUTION

**Chickamauga-Chattanooga National Military Park Range:**

**Global Range:** This vegetation is known to occur in the southeastern United States from central Kentucky, Virginia, and Maryland, south through Tennessee, North Carolina, South Carolina, Georgia, and Alabama to Florida and west through Mississippi and Louisiana to eastern Texas, Arkansas, and Oklahoma (Edwards 1982).

**Nations:** US

**States/Provinces:** AL, AR, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV

**USFS Ecoregions:** 221Hc:CCC, 222Ab:CCC, 222Ag:CCC, 222Ah:CCC, 222An:CCC, 231Bh:CCC, 231Ca:CCC, 231Cd:CCC, 232Bm:CCC, 234:C, M221Aa:CCC, M221Ab:CCC, M221Ca:CCP, M221Cb:CCC, M221Cc:CCP, M221Ce:CCP, M221Db:CCP, M221Dc:CCP, M221Dd:CCC, M222Aa:CCC, M222Ab:CCC, M231Aa:CCC, M231Ab:CCC, M231Ac:CCC, M231Ad:CCC

**Federal Lands:** DOD (Fort Benning); NPS (Chickamauga-Chattanooga?, Cumberland Gap, Natchez Trace, New River Gorge, Vicksburg); TVA (Tellico); USFS (Bankhead, Cherokee, Daniel Boone, George Washington, Jefferson, Oconee?, Ouachita, Ouachita (Coastal Plain), Ouachita (Mountains), Ozark, Talladega, Talladega (Oakmulgee), Talladega (Talladega))

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:**

**Local Description Authors:**

**Global Description Authors:** A.S. Weakley, mod. S.C. Gawler

**References:** CAP pers. comm. 1998, Edwards 1982, Fleming and Coulling 2001, Hoagland 1998b, Hoagland 2000, Remo 1999, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, Vanderhorst 2007

#### **Blackberry - Greenbrier Successional Shrubland Thicket**

*Rubus (argutus, trivialis) - Smilax (glauca, rotundifolia)* Shrubland

(Southern Blackberry, Southern Dewberry) - (Whiteleaf Greenbrier, Common Greenbrier) Shrubland

Identifier: CEGL004732

#### **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	Temperate cold-deciduous shrubland (III.B.2.N.a.)
Alliance	<i>Rubus (argutus, trivialis)</i> Shrubland Alliance (A.908)
Alliance (English name)	(Southern Blackberry, Southern Dewberry) Shrubland Alliance
Association	<i>Rubus (argutus, trivialis) - Smilax (glauca, rotundifolia)</i> Shrubland
Association (English name)	(Southern Blackberry, Southern Dewberry) - (Whiteleaf Greenbrier, Common Greenbrier)
Association (Common name)	Blackberry - Greenbrier Successional Shrubland Thicket

**Ecological System(s):**

#### ELEMENT CONCEPT

**Global Summary:** Stands of this successional community develop following disturbance (complete forest canopy removal). These stands are dominated by greenbrier species (*Smilax glauca*, *Smilax rotundifolia*) and blackberries/dewberries (*Rubus argutus*, *Rubus trivialis*). Many examples include a great variety of tree saplings and other woody species (*Quercus* spp., *Liquidambar styraciflua*, *Acer rubrum*, *Diospyros virginiana*, *Juniperus virginiana* var. *virginiana*, *Rhus copallinum*), herbs (*Solidago* spp., Asteraceae spp., *Helianthus* spp., *Hypericum*

spp., *Potentilla simplex*), and grasses (*Andropogon* spp., *Dichanthelium* spp., *Panicum* spp., *Schizachyrium scoparium*, *Lolium* spp., and *Sorghastrum nutans*). Communities that are surrounded by relatively intact ecosystems will tend to have more native species. Those surrounded by old fields or fragmented by development tend to have *Lonicera japonica* as a codominant vine overtopping much of the blackberry and greenbrier.

#### ENVIRONMENTAL DESCRIPTION

##### USFWS Wetland System:

##### Chickamauga-Chattanooga National Military Park Environment:

**Global Environment:** This community can exist in both lowlands and uplands that have been cleared but have not been further disturbed by continued mowing or plowing for 3-5 years.

#### VEGETATION DESCRIPTION

##### Chickamauga-Chattanooga National Military Park Vegetation:

**Global Vegetation:** Stands of this association are dominated by greenbrier species (*Smilax glauca*, *Smilax rotundifolia*) and blackberries/dewberries (*Rubus argutus*, *Rubus trivialis*). They also contain a great variety of tree saplings and other woody species (e.g., *Quercus* spp., *Liquidambar styraciflua*, *Acer rubrum*, *Rhus copallinum*). Some herbs in central Tennessee examples may include *Solidago* spp., Asteraceae spp., *Helianthus* spp., *Hypericum* spp., *Potentilla simplex*; grasses may include *Andropogon* spp., *Dichanthelium* spp., *Panicum* spp., *Schizachyrium scoparium*, *Lolium* spp., and *Sorghastrum nutans*. Communities that are surrounded by relatively intact ecosystems will tend to have more native species. Those surrounded by old fields or fragmented by development tend to have *Lonicera japonica* as a codominant vine overtopping much of the blackberry and greenbrier.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Global		
<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>

#### CHARACTERISTIC SPECIES

##### Chickamauga-Chattanooga National Military Park:

Global:

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

Global:

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** GNA (ruderal) (1-Oct-2001). This type represents ruderal successional vegetation dominated by species native to North America.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

##### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** In sandy parts of the southeastern U.S. Coastal Plain (e.g., Fort Benning, Georgia) the common blackberry is *Rubus cuneifolius*, and it does not form monocultural stands worthy of recognition as a vegetation type. At Arnold Air Force Base, Coffee and Franklin counties, Tennessee, this community is often found in powerline corridors and other areas that have experienced total canopy removal.

**Global Similar Associations:**

**Global Related Concepts:**

Abandoned Strip Mines (Schmalzer and DeSelm 1982) I  
 Cleared Areas (Schmalzer and DeSelm 1982) I

#### OTHER COMMENTS

##### Other Comments:

#### ELEMENT DISTRIBUTION

##### Chickamauga-Chattanooga National Military Park Range:

**Global Range:** This ruderal successional vegetation could be found throughout the upper southern United States.

**Nations:** US

**States/Provinces:** AL?, GA, KY, MS?, NC, SC, TN

**USFS Ecoregions:** 221Hc:CCC, 221He:CCC, 222Eb:CCC, 222Ed:CCC, 231Aa:CCC, 231Ae:CCC

**Federal Lands:** DOD (Arnold); NPS (Big South Fork, Blue Ridge Parkway, Chickamauga-Chattanooga?, Cowpens, Cumberland Gap, Kings Mountain, Mammoth Cave, Ninety Six, Obed, Stones River); USFS (Talladega (Oakmulgee)?, Talladega (Talladega)?, Talladega?, Tuskegee?)

#### ELEMENT SOURCES

##### Chickamauga-Chattanooga National Military Park Inventory Notes:

##### Chickamauga-Chattanooga National Military Park Plots:

##### Local Description Authors:

**Global Description Authors:** M.J. Russo, mod. R. White

**References:** NatureServe Ecology - Southeastern U.S. unpubl. data, Peet et al. unpubl. data 2002, Schmalzer and DeSelm 1982, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, TNC 1998a

### **Rocky Bar and Shore (Alder - Yellowroot Type)**

*Alnus serrulata* - *Xanthorhiza simplicissima* Shrubland

Smooth Alder - Yellowroot Shrubland

Identifier: C EGL003895

#### **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	Temporarily flooded cold-deciduous shrubland (III.B.2.N.d.)
Alliance	<i>Alnus serrulata</i> Temporarily Flooded Shrubland Alliance (A.943)
Alliance (English name)	Smooth Alder Temporarily Flooded Shrubland Alliance
Association	<i>Alnus serrulata</i> - <i>Xanthorhiza simplicissima</i> Shrubland
Association (English name)	Smooth Alder - Yellowroot Shrubland
Association (Common name)	Rocky Bar and Shore (Alder - Yellowroot Type)

**Ecological System(s):** South-Central Interior Small Stream and Riparian (CES202.706)  
 Cumberland Riverscour (CES202.036)  
 South-Central Interior Large Floodplain (CES202.705)

#### ELEMENT CONCEPT

**Global Summary:** This association includes shrublands on rocky or gravelly substrates along narrow river margins in the southeastern Blue Ridge Escarpment gorges, ranging into the Cumberland Plateau. Vegetation composition,

density, and height vary with frequency of flooding, substrate, and soil depth. The nominal shrubs are common and characteristic but not always dominant. Other shrubs may include *Arundinaria gigantea*, *Diervilla sessilifolia*, *Salix nigra*, *Salix sericea*, *Rhododendron arborescens*, *Rhododendron viscosum*, *Rhododendron maximum*, *Rhododendron periclymenoides*, *Kalmia latifolia*, *Leucothoe fontanesiana*, *Cornus foemina*, *Cornus amomum*, *Physocarpus opulifolius*, *Itea virginica*, and *Viburnum nudum* var. *cassinoides*. Arborescent species that occur as tall shrubs (or as occasional trees, less than 10% cover) include *Acer rubrum*, *Carpinus caroliniana*, *Diospyros virginiana*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Platanus occidentalis*, and *Tsuga canadensis*. Open areas dominated by grasses and forbs include species such as *Agrostis perennans*, *Boykinia aconitifolia*, *Carex torta*, *Holcus lanatus* (exotic), *Lycopus virginicus*, *Trautvetteria caroliniensis*, *Houstonia serpyllifolia*, *Impatiens capensis*, *Hypericum mutilum*, *Viola X primulifolia*, and *Eupatorium fistulosum*. Adjacent alluvial forests in the Blue Ridge are dominated by *Tsuga canadensis*, *Liriodendron tulipifera*, *Betula lenta*, and, at lower elevations, below 610 m (2000 feet), *Platanus occidentalis* and *Liquidambar styraciflua*.

### ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:** Riverine

#### Chickamauga-Chattanooga National Military Park Environment:

**Global Environment:** This association includes shrublands on rocky or gravelly substrates along narrow river margins in the southeastern Blue Ridge Escarpment gorges, ranging into the Cumberland Plateau. Vegetation composition, density, and height vary with frequency of flooding, substrate, and soil depth. The occurrences can be in very narrow bands of 1-2 meters or wider bars of up to 10-20 meters wide adjacent to large creeks and small rivers.

### VEGETATION DESCRIPTION

#### Chickamauga-Chattanooga National Military Park Vegetation:

**Global Vegetation:** The nominal shrubs are common and characteristic but not always dominant. Other shrubs may include *Arundinaria gigantea*, *Diervilla sessilifolia*, *Salix nigra*, *Salix sericea*, *Rhododendron arborescens*, *Rhododendron viscosum*, *Rhododendron maximum*, *Rhododendron periclymenoides*, *Kalmia latifolia*, *Leucothoe fontanesiana*, *Cornus foemina*, *Cornus amomum*, *Physocarpus opulifolius*, *Itea virginica*, and *Viburnum nudum* var. *cassinoides*. Arborescent species that occur as tall shrubs (or as occasional trees, less than 10% cover) include *Acer rubrum*, *Carpinus caroliniana*, *Diospyros virginiana*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Platanus occidentalis*, and *Tsuga canadensis*. Open areas dominated by grasses and forbs include species such as *Agrostis perennans*, *Boykinia aconitifolia*, *Carex torta*, *Holcus lanatus* (exotic), *Lycopus virginicus*, *Trautvetteria caroliniensis*, *Houstonia serpyllifolia*, *Impatiens capensis*, *Hypericum mutilum*, *Viola X primulifolia*, and *Eupatorium fistulosum*. Adjacent alluvial forests in the Blue Ridge are dominated by *Tsuga canadensis*, *Liriodendron tulipifera*, *Betula lenta*, and, at lower elevations, below 610 m (2000 feet), *Platanus occidentalis* and *Liquidambar styraciflua*.

### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
<b>Global</b>		
<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Tall shrub/sapling	Broad-leaved deciduous tree	<i>Alnus serrulata</i>
Short shrub/sapling	Semi-shrub	<i>Xanthorhiza simplicissima</i>

### CHARACTERISTIC SPECIES

#### Chickamauga-Chattanooga National Military Park:

**Global:** *Alnus serrulata*, *Carpinus caroliniana*, *Diospyros virginiana*, *Leucothoe fontanesiana*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Platanus occidentalis*, *Tsuga canadensis*, *Xanthorhiza simplicissima*

### OTHER NOTEWORTHY SPECIES

#### Chickamauga-Chattanooga National Military Park:

**Global:** *Diervilla rivularis*, *Spiraea virginiana*

### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G3G4 (17-Dec-1999). This community is naturally restricted in terms of geography and habitat, thus could be vulnerable to elimination. However, this community is often overlooked in inventories or not separately distinguished, and is likely much more common than the number of documented occurrences suggests. Threats to this community include alteration of the natural flooding regime due to damming of rivers and invasion by exotic species carried on river courses.

### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

#### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** This association is known from the Bankhead National Forest, but further inventory is needed to fully describe the variation of this type on the Bankhead and elsewhere in the Cumberland Plateau.

#### Global Similar Associations:

#### Global Related Concepts:

*Alnus/Xanthorhiza* rocky stream margin (Newell and Peet 1995) ?  
 IIE3a. Riverside Shoal and Stream Bar Complex (Allard 1990) B  
 Rocky Bar And Shore (Alder-Yellowwood Subtype) (Schafale 1998b) ?

### OTHER COMMENTS

#### Other Comments:

### ELEMENT DISTRIBUTION

#### Chickamauga-Chattanooga National Military Park Range:

**Global Range:** This association is found along montane rivers in the southeastern Blue Ridge Escarpment gorges and in the Cumberland Plateau of Kentucky south to Alabama.

**Nations:** US

**States/Provinces:** AL, GA, KY, NC, SC, TN

**USFS Ecoregions:** 221Ha:CCC, 221Hc:CCC, 221He:CCC, 231Cd:CCC, M221Dc:CCC, M221Dd:CCC

**Federal Lands:** NPS (Big South Fork, Blue Ridge Parkway, Chickamauga-Chattanooga?, Great Smoky Mountains, Little River Canyon?, Obed); USFS (Bankhead, Chattahoochee, Chattahoochee (Piedmont)?, Chattahoochee (Southern Blue Ridge), Daniel Boone, Nantahala, Pisgah, Sumter, Sumter (Mountains), Sumter (Piedmont)?)

### ELEMENT SOURCES

#### Chickamauga-Chattanooga National Military Park Inventory Notes:

#### Chickamauga-Chattanooga National Military Park Plots:

#### Local Description Authors:

**Global Description Authors:** R. White

**References:** Allard 1990, NatureServe Ecology - Southeastern U.S. unpubl. data, Nelson 1986, Newell and Peet 1995, Peet et al. unpubl. data 2002, Schafale 1998b, Schafale 2002, Schafale and Weakley 1990, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

### **Black Willow Riverbank Shrubland**

*Salix nigra* Temporarily Flooded Shrubland

Black Willow Temporarily Flooded Shrubland

Identifier: C EGL003901

### 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	Temporarily flooded cold-deciduous shrubland (III.B.2.N.d.)
Alliance	<i>Salix nigra</i> Temporarily Flooded Shrubland Alliance (A.948)
Alliance (English name)	Black Willow Temporarily Flooded Shrubland Alliance
Association	<i>Salix nigra</i> Temporarily Flooded Shrubland
Association (English name)	Black Willow Temporarily Flooded Shrubland
Association (Common name)	Black Willow Riverbank Shrubland

<b>Ecological System(s):</b>	Central Appalachian Riparian (CES202.609)
	Southern Piedmont Small Floodplain and Riparian Forest (CES202.323)
	Atlantic Coastal Plain Large River Floodplain Forest (CES203.066)
	Ozark-Ouachita Riparian (CES202.703)

### ELEMENT CONCEPT

**Global Summary:** This broadly defined type represents vegetation dominated by scrubby forms of *Salix nigra* across the southeastern and northeastern United States, and possibly into Canada. Stature and closure may vary depending on disturbance. Additional types may be developed as more information becomes available.

### ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:** Palustrine

**Chickamauga-Chattanooga National Military Park Environment:**

**Global Environment:**

### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:**

**Global Vegetation:**

### MOST ABUNDANT SPECIES

**Chickamauga-Chattanooga National Military Park**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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**Global**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:**

**Global:**

### OTHER NOTEWORTHY SPECIES

**Chickamauga-Chattanooga National Military Park:**

**Global:**

### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G4? (19-Sep-2001).

### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** This type conceptually includes communities formerly treated as woodlands [see the archived *Salix nigra* Woodland (CEGL003731)].

**Global Similar Associations:**

*Populus deltoides* - *Salix nigra* Forest (CEGL002018)

**Global Related Concepts:**

Alluvial Shrub Swamp/Woodland (Thompson 1996) B

IIE3a. Riverside Shoal and Stream Bar Complex (Allard 1990) B

Palustrine Broad-leaved Deciduous Scrub/Shrub and Forested Wetland, Seasonally Flooded (PSS/FO1C)  
(Cowardin et al. 1979) ?

**OTHER COMMENTS**

**Other Comments:**

**ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:**

**Global Range:** This is a potentially wide-ranging association found throughout the southeastern and eastern United States, and possibly into Canada. This broadly defined association is found from the Ozarks and Interior Low Plateau, south to the West and East Gulf coastal plains and Florida Peninsula, east to the Atlantic Coastal Plain (excluding the Southern Blue Ridge) and north into the Central Appalachians and Northern Piedmont.

**Nations:** CA?, US

**States/Provinces:** AL, AR, FL, GA, IL?, KY, LA, MD, MS, NC, OH, OK, ON?, SC, TN, TX, VA, WV

**USFS Ecoregions:** 221Ec:C??, 221Ed:C??, 221Ef:C??, 222Ab:CCC, 222Ag:CCC, 222Ah:CCC, 222An:CCC, 231Ca:CCC, 231Cd:CCC, 231Ga:CCC, 231Gb:CCC, 231Gc:CCC, 232:C, M221Aa:CCP, M221Ab:CCP, M221Ac:CCC, M221Ad:CCC, M221Bb:CCC, M221Bf:CCC, M221Da:CCC, M221Dc:CCC, M222Aa:CCC, M222Ab:CCC, M231Aa:CCC, M231Ab:CCC, M231Ac:CCC, M231Ad:CCC

**Federal Lands:** DOD (Fort Benning); NPS (Chickamauga-Chattanooga?); USFS (Bankhead, Cherokee?, Oconee?, Ouachita (Coastal Plain)?, Ouachita (Mountains)?, Ouachita?, Ozark?); USFWS (Eufaula)

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:**

**Local Description Authors:**

**Global Description Authors:** Southeastern Ecology Group

**References:** ALNHP 2002, Allard 1990, Baalman 1965, Blair 1938, Blair and Hubbell 1938, Cowardin et al. 1979, Fleming et al. 2001, Harrison 2004, Hefley 1937, Hoagland 2000, Johnson 1984, Kelting and Penfound 1950, McCoy 1958, Penfound 1953, Penfound 1961, Penfound 1965, Petranka and Holland 1980, Schafale and Weakley 1990, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, Thompson 1996

**Southeastern Smooth Alder Swamp**

*Alnus serrulata* Southeastern Seasonally Flooded Shrubland

Smooth Alder Southeastern Seasonally Flooded Shrubland

Identifier: CEGL008474

**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> Southeastern Seasonally Flooded Shrubland
Association (English name)	Smooth Alder Southeastern Seasonally Flooded Shrubland
Association (Common name)	Southeastern Smooth Alder Swamp
<b>Ecological System(s):</b>	East Gulf Coastal Plain Small Stream and River Floodplain Forest (CES203.559) East Gulf Coastal Plain Northern Depression Pondshore (CES203.558)

### ELEMENT CONCEPT

**Global Summary:** This smooth alder swamp is found in the upper southeastern United States, most probably from Kentucky south to central Alabama and Georgia, and west to Mississippi. These shrublands are found on muck overlying mineral soils, at the edges of forested swamps, or in other related seasonally flooded situations, including depressions in floodplains and the backwaters of lakes and beaver ponds. Hydrologic alteration of systems (e.g., creation of impoundments by the agency of humans and/or beaver) may expand habitat for this association. The vegetation is dominated by tall shrubs, and is characterized by some combination of *Alnus serrulata*, *Viburnum* spp., *Cornus* spp., and *Salix* spp. In addition, saplings of *Acer rubrum* are typical. Other shrubs present may include *Cephalanthus occidentalis*, *Decodon verticillatus*, and *Ilex verticillata*. Herbaceous associates include *Osmunda regalis*, *Thelypteris palustris*, *Galium* spp., *Typha latifolia*, *Peltandra virginica*, and *Carex* spp. Tree species such as *Acer rubrum* and *Juglans nigra* may exist on the fringes of such an association, occasionally overshadowing parts of the association.

### ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:** Palustrine

#### Chickamauga-Chattanooga National Military Park Environment:

**Global Environment:** These shrublands are found on muck overlying mineral soils, at the edges of forested swamps, or in other related seasonally flooded situations, including depressions in floodplains and the backwaters of lakes and beaver ponds. Hydrologic alteration of systems (e.g., creation of impoundments by the agency of humans and/or beaver) may expand habitat for this association.

### VEGETATION DESCRIPTION

#### Chickamauga-Chattanooga National Military Park Vegetation:

**Global Vegetation:** Stands of this vegetation are dominated by tall shrubs and are characterized by some combination of *Alnus serrulata*, *Viburnum* spp., *Cornus* spp., and *Salix* spp. In addition, saplings of *Acer rubrum* are typical. Other shrubs present may include *Cephalanthus occidentalis*, *Decodon verticillatus*, and *Ilex verticillata*. Herbaceous associates include *Osmunda regalis*, *Thelypteris palustris*, *Boehmeria cylindrica*, *Polygonum sagittatum*, *Commelina virginica*, *Galium* spp., *Lycopus* spp., *Typha latifolia*, *Peltandra virginica*, *Mikania scandens*, and *Carex* spp. (e.g., *Carex crinita*, *Carex atlantica*). Tree species such as *Acer rubrum* and *Juglans nigra* may exist on the fringes of such an association, occasionally overshadowing parts of it. The exotic *Murdannia keisak* (= *Aneilema keisak*) may also be present.

### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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### CHARACTERISTIC SPECIES

#### Chickamauga-Chattanooga National Military Park:

**Global:****OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:****Global:****CONSERVATION STATUS RANK**

**Global Rank & Reasons:** G4 (15-Oct-2002). This association occurs in a variety of seasonally flooded habitats in the upper southeastern United States. This includes the edges of forested swamps, depressions in floodplains, and the backwaters of lakes and beaver ponds. Hydrologic alteration of systems (e.g., creation of impoundments by the agency of humans and/or beaver) may expand habitat for this association. This is not a rare or imperiled vegetation type, even though its occurrence is very poorly documented.

**CLASSIFICATION**

**Status:** Standard

**Classification Confidence:** 3 - Weak

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** The range of this type may abut the range of *Alnus serrulata* Swamp Shrubland (CEGL005082) in the vicinity of the Ohio River; the distinction there is obscure. Occurrences on the edges of impoundments would be assumed to be of lower quality than those in more hydrologically natural situations.

**Global Similar Associations:**

*Alnus serrulata* Seasonally Flooded Shrubland [Provisional] (CEGL008467)--a placeholder for related vegetation west of the Mississippi River in Arkansas.

*Alnus serrulata* Swamp Shrubland (CEGL005082)

**Global Related Concepts:****OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION****Chickamauga-Chattanooga National Military Park Range:**

**Global Range:** This smooth alder swamp is found in the upper southeastern United States, most probably from Kentucky south to central Alabama and Georgia.

**Nations:** US

**States/Provinces:** AL?, GA, KY, MS, TN

**USFS Ecoregions:** 221Hc:CCC, 222En:CCC, 222Eo:CCC, 231Aa:CCC, 231B:CC, 231C:CP, 231D:CP

**Federal Lands:** DOD (Fort Benning); NPS (Big South Fork, Chickamauga-Chattanooga?, Natchez Trace); USFS (Daniel Boone, Holly Springs, Oconee, Talladega (Oakmulgee)?, Talladega (Talladega)?, Talladega?, Tuskegee?)

**ELEMENT SOURCES****Chickamauga-Chattanooga National Military Park Inventory Notes:****Chickamauga-Chattanooga National Military Park Plots:****Local Description Authors:**

**Global Description Authors:** M. Pyne

**References:** NatureServe Ecology - Southeastern U.S. unpubl. data, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

**Southern Limestone Glade Margin Shrubland**

*Juniperus virginiana* var. *virginiana* - *Forestiera ligustrina* - *Rhus aromatica* - *Hypericum frondosum* Shrubland

Eastern Red-cedar - Glade Privet - Fragrant Sumac - Golden St. John's-wort Shrubland

Identifier: CEGL003938

**NVC Classification**

Physiognomic Class	Shrubland (III)
Physiognomic Subclass	Mixed evergreen-deciduous shrubland (III.C.)
Physiognomic Group	Mixed evergreen - cold-deciduous shrubland (III.C.2.)
Physiognomic Subgroup	Natural/Semi-natural mixed evergreen - cold-deciduous shrubland (III.C.2.N.)
Formation	Mixed evergreen - cold-deciduous shrubland (III.C.2.N.a.)
Alliance	<i>Juniperus virginiana</i> - <i>Rhus aromatica</i> Shrubland Alliance (A.1049)
Alliance (English name)	Eastern Red-cedar - Fragrant Sumac Shrubland Alliance
Association	<i>Juniperus virginiana</i> var. <i>virginiana</i> - <i>Forestiera ligustrina</i> - <i>Rhus aromatica</i> - <i>Hypericum frondosum</i> Shrubland
Association (English name)	Eastern Red-cedar - Glade Privet - Fragrant Sumac - Golden St. John's-wort Shrubland
Association (Common name)	Southern Limestone Glade Margin Shrubland
<b>Ecological System(s):</b>	Nashville Basin Limestone Glade and Woodland (CES202.334)

**ELEMENT CONCEPT**

**Global Summary:** This shrubland is a zonal component of Central Basin (Tennessee) limestone cedar glades. It is also found on limestone outcrops of the Alabama Cumberland Plateau and Moulton Valley glade systems, and as a component of cedar glade complexes at Chickamauga-Chattanooga National Military Park. It also occurs on the Pennyroyal Karst Plain of Kentucky. Alabama and Kentucky occurrences are rare and of restricted distribution and limited extent. The substrate consists of broken fragments of flat-bedded sedimentary limestone, with accumulations of shallow soil. Characteristic shrubs include *Juniperus virginiana* var. *virginiana*, *Rhus aromatica* var. *aromatica*, *Frangula caroliniana*, *Forestiera ligustrina*, *Berchemia scandens*, *Hypericum frondosum*, *Sideroxylon lycioides*, and stunted individuals of *Acer saccharum*, *Quercus muehlenbergii*, *Quercus shumardii*, *Fraxinus americana*, and *Ulmus alata*. Alabama occurrences may contain an occasional *Aesculus pavia*. A low 'herbaceous' stratum is dominated by *Cheilanthes lanosa*, *Pleurochaete squarrosa*, *Thuidium delicatulum*, *Climacium americanum*, *Cladonia* spp., and *Opuntia humifusa*. Typically grades into open, herbaceous-dominated glades, or into woodlands or forests commonly dominated by *Quercus muehlenbergii*, *Fraxinus americana*, and *Celtis laevigata*.

**ENVIRONMENTAL DESCRIPTION****USFWS Wetland System:****Chickamauga-Chattanooga National Military Park Environment:**

**Global Environment:** This shrubland is a zonal component of Central Basin (Tennessee) limestone cedar glades and limestone outcrops of Alabama Cumberland Plateau and Moulton Valley glade systems, as well as on the Pennyroyal Karst Plain of Kentucky. The substrate consists of broken fragments of flat-bedded sedimentary limestone, with accumulations of shallow soil. Alabama and Kentucky occurrences are rare and of restricted distribution and limited extent. This vegetation typically grades into open, herbaceous-dominated glades, or into woodlands or into forests commonly dominated by *Quercus muehlenbergii*, *Fraxinus americana*, and *Celtis laevigata*.

**VEGETATION DESCRIPTION****Chickamauga-Chattanooga National Military Park Vegetation:**

**Global Vegetation:** Characteristic shrubs in stands of this association include *Juniperus virginiana* var. *virginiana*, *Rhus aromatica* var. *aromatica*, *Frangula caroliniana*, *Forestiera ligustrina*, *Berchemia scandens*, *Hypericum frondosum*, *Sideroxylon lycioides*, and stunted individuals of *Acer saccharum*, *Quercus muehlenbergii*, *Quercus shumardii*, *Fraxinus americana*, and *Ulmus alata*. Alabama occurrences may contain an occasional *Aesculus pavia*. A low 'herbaceous' stratum is dominated by *Cheilanthes lanosa*, *Pleurochaete squarrosa*, *Thuidium delicatulum*, *Climacium americanum*, *Cladonia* spp., and *Opuntia humifusa*. This vegetation typically grades into open, herbaceous-dominated glades, or into woodlands or into forests commonly dominated by *Quercus muehlenbergii*, *Fraxinus americana*, and *Celtis laevigata*.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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<u>Global Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

##### Chickamauga-Chattanooga National Military Park:

Global:

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

Global:

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G3G4 (14-Dec-1999). This vegetation type is restricted to dry limestone substrates in the Nashville Basin of Tennessee and related areas of Alabama and Kentucky. Although this shrubland type can be dominant at some extensive glade sites and is more stable than some other glade communities, its overall coverage of the landscape is limited, and it is threatened by development and land-use conversion in this area of rapidly increasing human population. Examples which are not conserved on nature preserves, state forests, or Corps of Engineers lands are highly vulnerable to development pressure. This shrub zone does not typically provide habitat for rare plant species, but it is an important component of this threatened landscape. Alabama and Kentucky examples are rare and limited in extent.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 1 - Strong

##### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:**

##### Global Similar Associations:

*Rhus aromatica* - *Celtis tenuifolia* / *Carex eburnea* Shrubland (CEGL004393)--of limestone cliff edges in Kentucky.

##### Global Related Concepts:

Central Basin Limestone Glade Complex, Shrub Zone (Pyne 1994) ?

#### OTHER COMMENTS

**Other Comments:**

#### ELEMENT DISTRIBUTION

**Chickamauga-Chattanooga National Military Park Range:** This association was observed, but no plot data were taken, from the glade complexes of Chickamauga Battlefield.

**Global Range:** This association is most abundant in the Nashville Basin of Tennessee. Examples in Alabama and Kentucky are rare and of limited extent.

**Nations:** US

**States/Provinces:** AL:S2, GA, KY, TN

**USFS Ecoregions:** 222Ec:CC?, 222Ed:CCC, 222Ee:CC?, 222Ef:CC?, 222Eg:CC?, 222Fa:C??, 222Fb:C??, 231Cd:CCC, 231Ce:CCC, 231Da:CCC

**Federal Lands:** DOD (J. Percy Priest); NPS (Chickamauga-Chattanooga, Stones River); TVA (Columbia); USFS (Bankhead)

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** none.

**Local Description Authors:**

**Global Description Authors:** M. Pyne

**References:** Evans 1991, Palmer-Ball et al. 1988, Pyne 1994, Quarterman 1950, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

### Little Bluestem - Broomsedge Grassland

*Schizachyrium scoparium* - *Andropogon* (*gyrans*, *ternarius*, *virginicus*) Herbaceous Vegetation

Little Bluestem - (Elliott's Beardgrass, Splitbeard Bluestem, Common Broomsedge) Herbaceous Vegetation

Identifier: CEGL007707

#### 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	Tall sod temperate grassland (V.A.5.N.a.)
Alliance	<i>Schizachyrium scoparium</i> - <i>Sorghastrum nutans</i> Herbaceous Alliance (A.1198)
Alliance (English name)	Little Bluestem - Yellow Indiangrass Herbaceous Alliance
Association	<i>Schizachyrium scoparium</i> - <i>Andropogon</i> ( <i>gyrans</i> , <i>ternarius</i> , <i>virginicus</i> )
Herbaceous Vegetation	
Association (English name)	Little Bluestem - (Elliott's Beardgrass, Splitbeard Bluestem, Common
Broomsedge) Herbaceous	
	Vegetation
Association (Common name)	Little Bluestem - Broomsedge Grassland

**Ecological System(s):** Eastern Highland Rim Prairie and Barrens (CES202.354)  
Western Highland Rim Prairie and Barrens (CES202.352)

#### ELEMENT CONCEPT

**Global Summary:** This mixed-grass association represents a variety of essentially native perennial grasslands which are (or have been) human-maintained to some extent and which contain a variable mix of *Schizachyrium scoparium* with *Andropogon* spp. It may occur on annually mowed powerline rights-of-way, mowed successional or abandoned agricultural fields, pastures, etc. Examples are known from the Eastern and Western Highland Rim of Tennessee, related areas of Kentucky, as well as possibly Alabama. It is described and documented from the Cumberland Plateau and Interior Low Plateau, but it could range into the adjacent Upper East Gulf Coastal Plain. *Schizachyrium scoparium* is codominant along with a variable mixture of the nominal *Andropogon* species. In examples from the Eastern Highland Rim of Coffee County, Tennessee (Arnold Air Force Base), other dominant

grasses may include *Dichanthelium aciculare* (= *Dichanthelium angustifolium*), *Gymnopogon brevifolius*, and *Dichanthelium dichotomum* var. *dichotomum* (= var. *ramulosum*). On the Western Highland Rim of middle Tennessee, these barrens occur on winter-wet, summer-dry loessal soils, which are generally deep, with chert fragments; rock outcrops are absent. The presence of this vegetation may be related to remnant surficial deposits of Cretaceous gravels which remain on some of the high flat ridges in this landscape. Some forbs found in these examples include *Asclepias amplexicaulis*, *Sericocarpus linifolius*, *Boltonia* sp., *Comandra umbellata*, *Eupatorium album*, *Eupatorium serotinum*, *Galium pilosum*, *Helianthus atrorubens*, *Helianthus mollis*, *Hypericum virgatum* (= *Hypericum denticulatum* var. *acutifolium*), *Hypericum punctatum*, *Mimosa microphylla* (= *Schrankia microphylla*), *Monarda fistulosa*, *Parthenium integrifolium*, *Pycnanthemum tenuifolium*, *Rudbeckia hirta*, *Sabatia angularis*, and *Tephrosia virginiana*.

#### ENVIRONMENTAL DESCRIPTION

##### USFWS Wetland System:

##### Chickamauga-Chattanooga National Military Park Environment:

##### Global Environment:

#### VEGETATION DESCRIPTION

##### Chickamauga-Chattanooga National Military Park Vegetation:

**Global Vegetation:** In stands of this association, *Schizachyrium scoparium* is codominant along with a variable mixture of the nominal *Andropogon* species. In examples from the Eastern Highland Rim of Coffee County, Tennessee (Arnold Air Force Base), other dominant grasses may include *Dichanthelium aciculare* (= *Dichanthelium angustifolium*), *Gymnopogon brevifolius*, and *Dichanthelium dichotomum* var. *dichotomum* (= *Dichanthelium dichotomum* var. *ramulosum*). Other common species may include *Eurybia hemispherica* (= *Aster paludosus* ssp. *hemisphericus*), *Symphyotrichum dumosum* (= *Aster dumosus*), *Sericocarpus linifolius* (= *Aster solidagineus*), *Coreopsis major*, *Eupatorium hyssopifolium*, *Eupatorium rotundifolium*, *Helianthus angustifolius*, *Liatris microcephala*, *Liatris spicata*, *Packera anonyma* (= *Senecio anonymus*), *Solidago juncea*, *Solidago odora*, *Chamaecrista fasciculata*, *Chamaecrista nictitans*, *Lespedeza capitata*, *Stylosanthes biflora*, *Lobelia puberula*, *Diodia teres*, *Potentilla simplex*, *Aristida longispica*, *Calamagrostis coarctata*, *Dichanthelium dichotomum*, *Sorghastrum nutans*, *Pteridium aquilinum*, and *Smilax glauca*. At Arnold Air Force Base, one possibly distinctive phase of this vegetation is found on less well-drained soils (Tyler loam and Holston loam). The dominant species here are *Andropogon virginicus*, *Schizachyrium scoparium*, *Dichanthelium scoparium*, *Dichanthelium dichotomum*, and *Sorghastrum nutans*. Other common species in this phase include *Diodia teres*, *Aristida dichotoma*, *Aristida longispica*, *Paspalum laeve*, *Calamagrostis coarctata*, *Chasmanthium laxum*, *Gymnopogon brevifolius*, *Panicum anceps*, and *Eleocharis microcarpa*. Examples from other situations may exhibit a different mix of native forbs.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

##### Chickamauga-Chattanooga National Military Park:

##### Global:

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

##### Global:

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G3? (19-Jan-2000). This perennial grassland type may have been distributed widely in the Cumberland Plateau, Interior Low Plateau and adjacent Upper East Gulf Coastal Plain at one time, but its

frequency of occurrence has declined. The combination of lack of fire and changing agricultural patterns with more recent land conversion from agriculture to either forestry or suburban development has altered or destroyed many sites. Even though there are very few element occurrences of this type, this may not reflect its true distribution or rarity. Some of the sites where this vegetation type is found have particular soil characteristics (hardpans, surficial gravels) which have promoted its persistence. While moderately restricted in its environmental preferences, this perennial grassland type requires management (fire and/or mowing) for its maintenance. Existing examples are representative of a savanna-woodland mosaic that existed in parts of the southern Interior Low Plateau (and possibly adjacent Upper East Gulf Coastal Plain) before and shortly after settlement. Many examples have presumably been converted to agriculture or other land uses. Some in the western Highland Rim are on unprotected private land, and others are on Arnold Air Force Base, where they are managed with fire and/or mowing to maintain their herbaceous diversity.

### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

#### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** Described from Arnold Air Force Base, Coffee County, Tennessee. See also *Andropogon gerardii* - *Schizachyrium scoparium* - (*Calamagrostis coarctata*, *Panicum virgatum*) Herbaceous Vegetation (CEGL007706), in the V.A.S.N.a *Andropogon gerardii* - (*Sorghastrum nutans*) Herbaceous Alliance (A.1192), which is more mesic and has a more limited distribution.

#### Global Similar Associations:

*Andropogon gerardii* - *Schizachyrium scoparium* - (*Calamagrostis coarctata*, *Panicum virgatum*) Herbaceous Vegetation (CEGL007706)

*Juniperus virginiana* var. *virginiana* / *Rhus copallinum* / *Schizachyrium scoparium* Woodland (CEGL007704)--is a variant with dominance by Eastern red-cedar.

*Pinus rigida* / *Schizachyrium scoparium* - *Sorghastrum nutans* - *Baptisia tinctoria* Woodland (CEGL003617)

#### Global Related Concepts:

Gravel Barrens (DeSelm 1988) ?

### OTHER COMMENTS

**Other Comments:**

### ELEMENT DISTRIBUTION

#### Chickamauga-Chattanooga National Military Park Range:

**Global Range:** The full range of this type is not known, but it could be scattered across the Cumberland Plateau, southern Interior Low Plateau of Alabama, Kentucky, and Tennessee, on various substrates. It could be found in the adjacent Upper East Gulf Coastal Plain, but no examples there have been documented.

**Nations:** US

**States/Provinces:** AL?, KY, TN

**USFS Ecoregions:** 221Hc:CCC, 221He:CCC, 222Cb:CP?, 222Cf:CPP, 222Cg:CPP, 222Eb:CCC, 222Ef:CCP, 222Eg:CCC, 222Eo:CCC

**Federal Lands:** DOD (Arnold); NPS (Big South Fork, Chickamauga-Chattanooga?, Mammoth Cave, Obed?); USFS (Daniel Boone)

### ELEMENT SOURCES

#### Chickamauga-Chattanooga National Military Park Inventory Notes:

#### Chickamauga-Chattanooga National Military Park Plots:

#### Local Description Authors:

**Global Description Authors:** M. Pyne, mod. C.W. Nordman

**References:** DeSelm 1988, Palmer-Ball et al. 1988, Schmalzer and DeSelm 1982, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, TNC 1998a

### **Southern Ridge and Valley Dry-Mesic Grassland**

*Schizachyrium scoparium* - *Sorghastrum nutans* - *Silphium* spp. Herbaceous Vegetation

Little Bluestem - Yellow Indiangrass - Rosinweed species Herbaceous Vegetation

Identifier: CEGL007932

### **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	Tall sod temperate grassland (V.A.5.N.a.)
Alliance	<i>Schizachyrium scoparium</i> - <i>Sorghastrum nutans</i> Herbaceous Alliance (A.1198)
Alliance (English name)	Little Bluestem - Yellow Indiangrass Herbaceous Alliance
Association	<i>Schizachyrium scoparium</i> - <i>Sorghastrum nutans</i> - <i>Silphium</i> spp. Herbaceous
Vegetation	
Association (English name)	Little Bluestem - Yellow Indiangrass - Rosinweed species Herbaceous
Vegetation	
Association (Common name)	Southern Ridge and Valley Dry-Mesic Grassland

**Ecological System(s):** Southern Ridge and Valley Patch Prairie (CES202.453)

### **ELEMENT CONCEPT**

**Global Summary:** Mesic to dry-mesic perennial grasslands of the southern Ridge and Valley of Tennessee. This vegetation is dominated by *Schizachyrium scoparium* and *Sorghastrum nutans*, in patches of various combinations and percent covers depending on slope position. Also contains *Andropogon* spp., *Dichanthelium* spp., and diverse forbs. Best developed on mid to lower slopes, where soils are deep enough to support perennial grasses. *Silphium terebinthinaceum* can be a prominent feature of this vegetation type. Some other taxa present include *Hypericum dolabriforme*, *Manfreda virginica*, *Silphium asteriscus*, and *Silphium trifoliatum*. Some examples of this vegetation are partly maintained by mechanical clearing of powerline rights-of-way. A slightly more mesic community which may occur adjacent to this one is *Andropogon gerardii* - *Panicum (anceps, virgatum)* Herbaceous Vegetation (CEGL007931). Under conditions of fire suppression, *Juniperus virginiana* may invade examples of this vegetation and can form dense stands which suppress herbaceous plants.

### **ENVIRONMENTAL DESCRIPTION**

**USFWS Wetland System:**

**Chickamauga-Chattanooga National Military Park Environment:**

**Global Environment:**

### **VEGETATION DESCRIPTION**

**Chickamauga-Chattanooga National Military Park Vegetation:**

**Global Vegetation:**

### **MOST ABUNDANT SPECIES**

**Chickamauga-Chattanooga National Military Park**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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**Global**

**Stratum****Lifeform****Species****CHARACTERISTIC SPECIES****Chickamauga-Chattanooga National Military Park:****Global:****OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:****Global:****CONSERVATION STATUS RANK**

**Global Rank & Reasons:** G2? (29-Sep-1999). While this community is well distributed on the Oak Ridge DOE Reservation in appropriate habitat, it has been eliminated or severely reduced elsewhere, due to fire suppression and/or conversion to managed pasture dominated by *Festuca* spp. and other exotic grasses.

**CLASSIFICATION****Status:** Standard**Classification Confidence:** 3 - Weak**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** Described from Oak Ridge Reservation, Anderson and Roane counties, Tennessee. Currently most available habitat for this vegetation is found in annually mowed powerline rights-of-way. See also *Andropogon gerardii* - *Panicum (anceps, virgatum)* Herbaceous Vegetation (CEGL007931) in the V.A.5.N.a *Andropogon gerardii* - (*Sorghastrum nutans*) Herbaceous Alliance (A.1192), which is typically more mesic.

**Global Similar Associations:**

*Andropogon gerardii* - *Panicum (anceps, virgatum)* Herbaceous Vegetation (CEGL007931)--a wetter grassland type in the same area.

*Schizachyrium scoparium* - *Andropogon gerardii* - *Silphium terebinthinaceum* Coosa Valley Barren Herbaceous Vegetation (CEGL004757)--in the Coosa Valley of Georgia.

**Global Related Concepts:**

Bluestem Tallgrass Prairie (Pyne 1994) B

ID4a. Bluestem Tallgrass Prairie (Allard 1990) B

**OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION****Chickamauga-Chattanooga National Military Park Range:**

**Global Range:** These perennial grasslands occur in the southern Ridge and Valley of Tennessee.

**Nations:** US**States/Provinces:** TN**USFS Ecoregions:** 221Ja:CCC**Federal Lands:** DOE (Oak Ridge); NPS (Chickamauga-Chattanooga?)**ELEMENT SOURCES****Chickamauga-Chattanooga National Military Park Inventory Notes:****Chickamauga-Chattanooga National Military Park Plots:****Local Description Authors:****Global Description Authors:** M. Pyne

**References:** Allard 1990, DeSelm et al. 1969, Pyne 1994, Southeastern Ecology Working Group n.d., TDNH unpubl. data

### **Successional Broom-sedge Vegetation**

*Andropogon virginicus* var. *virginicus* Herbaceous Vegetation

Broomsedge Bluestem Herbaceous Vegetation

Identifier: CEGL004044

### **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>Andropogon virginicus</i> Herbaceous Alliance (A.1208)
Alliance (English name)	Broomsedge Bluestem Herbaceous Alliance
Association	<i>Andropogon virginicus</i> var. <i>virginicus</i> Herbaceous Vegetation
Association (English name)	Broomsedge Bluestem Herbaceous Vegetation
Association (Common name)	Successional Broom-sedge Vegetation

**Ecological System(s):** East Gulf Coastal Plain Jackson Prairie and Woodland (CES203.555)  
Texas-Louisiana Coastal Prairie (CES203.550)

### **ELEMENT CONCEPT**

**Global Summary:** This association includes herbaceous-dominated vegetation that has been anthropogenically altered and/or maintained, especially on old fields, and pastures. Examples support predominately native species or a mixture of native and exotic species, one of the most dominant or characteristic species being *Andropogon virginicus* var. *virginicus*. *Lolium pratense* (= *Festuca pratensis*) can dominate fields early in the season. This is a very common and wide-ranging association and can be quite variable in terms of species composition. Additional components are other perennial grasses and herbaceous species, most with pioneer or weedy tendencies, the exact composition of which will vary with geography, management history, and habitat.

### **ENVIRONMENTAL DESCRIPTION**

**USFWS Wetland System:**

**Chickamauga-Chattanooga National Military Park Environment:**

**Global Environment:** This vegetation typically occurs on old fields, pastures, and rocky sites. It will persist indefinitely under a regular mowing regime, e.g., in powerline corridors.

### **VEGETATION DESCRIPTION**

**Chickamauga-Chattanooga National Military Park Vegetation:**

**Global Vegetation:** Stands of this community are dominated by *Andropogon virginicus* var. *virginicus*, sometimes codominant with *Lolium pratense*. Associated species vary with geography and habitat and include typical pioneer species. Species with high cover values in plot samples attributed to this type include *Tridens flavus*, *Setaria parviflora* (= *Setaria geniculata*), *Eragrostis spectabilis*, and *Panicum anceps* (NatureServe Ecology unpubl. data). On the eastern Highland Rim of Tennessee (Arnold Air Force Base), associated species include *Diodia teres*, *Aristida dichotoma*, *Aristida oligantha*, *Packeria anonyma* (= *Senecio anonymus*), *Paspalum laeve*, *Lespedeza virginica*, and *Plantago virginica*. *Rubus argutus* and *Smilax* spp. may be locally abundant but are not dominant. In clearcuts, *Schizachyrium scoparium*, *Danthonia spicata*, and *Dichanthelium* spp. are also common, as are occasional *Quercus* spp. and *Rubus argutus*. The plot at Shiloh National Military Park (western Tennessee) was a mowed field of mostly native species, dominated by *Andropogon virginicus* var. *virginicus*. *Paspalum setaceum* and *Tridens flavus* were codominant (with less cover). Other herbaceous plants with high cover values were *Setaria parviflora*

(= *Setaria geniculata*), *Diodia teres*, *Schizachyrium scoparium*, and less common were *Packera anonyma*, *Sorghum halepense*, and *Cyperus retrorsus*. At less than 1% cover were *Polypremum procumbens*, *Oxalis stricta*, *Eragrostis spectabilis*, *Salvia lyrata*, *Solanum carolinense*, *Digitaria sanguinalis*, *Panicum anceps*, *Croton willdenowii* (= *Crotonopsis elliptica*), *Trifolium pratense*, *Kummerowia striata*, *Coreopsis pubescens*, *Plantago lanceolata*, and *Mecardonia acuminata*. At only a trace amount of cover were *Conyza canadensis*, *Acalypha virginica*, *Solidago* sp., *Erigeron annuus*, *Sida spinosa*, *Hypericum drummondii*, *Polygala verticillata*, *Eupatorium capillifolium*, *Passiflora incarnata*, and *Asclepias amplexicaulis*. In West Virginia, common associates include *Sorghastrum nutans*, *Dichanthelium clandestinum*, *Anthoxanthum odoratum*, *Phleum pratense*, *Dactylis glomerata*, *Daucus carota*, *Lotus corniculatus*, *Trifolium pratense*, *Leucanthemum vulgare*, *Solidago canadensis*, *Solidago rugosa*, and *Solidago nemoralis*.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Global		
<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Herb (field)	Graminoid	<i>Andropogon virginicus</i> var. <i>virginicus</i>

#### CHARACTERISTIC SPECIES

##### Chickamauga-Chattanooga National Military Park:

Global:

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

Global:

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** GNA (ruderal) (8-Aug-2000). This is a ruderal community and represents vegetation resulting from succession following anthropogenic disturbance of an area. It is not a conservation priority for its own sake and does not receive a conservation rank.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 1 - Strong

##### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** Phenology can affect apparent composition: in West Virginia, fields visited early in the season had high cover of *Lolium pratense*, while those sampled later in the season were dominated by *Andropogon virginicus*.

**Global Similar Associations:**

**Global Related Concepts:**

Old fields (Vanderhorst 2001a) ?

#### OTHER COMMENTS

**Other Comments:**

#### ELEMENT DISTRIBUTION

##### Chickamauga-Chattanooga National Military Park Range:

**Global Range:** This community ranges throughout most or all of the southeastern United States, extending north to Virginia and West Virginia.

**Nations:** US

**States/Provinces:** AL, AR, GA, IL, IN, KY, LA, MO?, MS, NC, OK, SC, TN, TX, VA, WV

**USFS Ecoregions:** 222Ab:CCC, 222Ag:CCC, 222Ah:CCC, 222An:CCC, 222Cg:CCC, 222Eg:CCC, 231Aa:CCC, 231Fa:CCP, 231Fb:CCC, 231Ga:CCC, 231Gb:CCC, 231Gc:CCC, 232B:CC, 232F:CC, 255Da:CCC, 255Dc:CCC, M221Aa:CCC, M221Ab:CCC, M221Ba:CC?, M221Bb:CCC, M221Bd:CC?, M221Ca:CPP, M221Cb:CPP, M221Cc:CPP, M221Ce:CPP, M221Da:CCC, M221Db:CCC, M221Dc:CCP, M221Dd:CCP, M222Aa:CCC, M222Ab:CCC, M231Aa:CCC, M231Ab:CCC, M231Ac:CCC, M231Ad:CCC

**Federal Lands:** DOD (Arnold, Camp Dawson, Fort Benning, Fort Gordon); NPS (Big South Fork, Chickamauga-Chattanooga?, Cowpens, Fort Donelson, Kings Mountain, Lincoln Birthplace, Little River Canyon?, Mammoth Cave, Ninety Six, Shiloh, Stones River); USFS (Cherokee, George Washington, Jefferson, Oconee?, Ouachita (Coastal Plain)?, Ouachita (Mountains)?, Ouachita?, Ozark?, Talladega (Oakmulgee)?, Talladega (Talladega)?, Talladega?, Tuskegee?); USFWS (Anahuac, Big Boggy?, Brazoria)

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:**

**Local Description Authors:**

**Global Description Authors:** A.S. Weakley, mod. C.W. Nordman and S.C. Gawler

**References:** Fleming and Coulling 2001, Hoagland 2000, NatureServe Ecology - Southeastern U.S. unpubl. data, Penfound 1953, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, TNC 1998a, Tarr et al. 1980, Vanderhorst 2001a, White and Madany 1978

#### Cultivated Meadow

*Lolium (arundinaceum, pratense)* Herbaceous Vegetation

(Tall Fescue, Meadow Fescue) Herbaceous Vegetation

Identifier: CEGL004048

#### 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>Lolium (arundinaceum, pratense)</i> Herbaceous Alliance (A.1213)
Alliance (English name)	(Tall Fescue, Meadow Ryegrass) Herbaceous Alliance
Association	<i>Lolium (arundinaceum, pratense)</i> Herbaceous Vegetation
Association (English name)	(Tall Fescue, Meadow Fescue) Herbaceous Vegetation
Association (Common name)	Cultivated Meadow

**Ecological System(s):**

#### ELEMENT CONCEPT

**Global Summary:** This association includes grassland pastures and hayfields, more-or-less cultural, though sometimes no longer actively maintained. The dominant species in this type are the European "tall or meadow fescues" of uncertain and controversial generic placement. Several other exotic grasses (*Agrostis gigantea*, *Dactylis glomerata*, *Holcus lanatus*, *Phleum pratense*, and *Poa pratensis*, for example) are common associates. These communities are sometimes nearly monospecific but can also be very diverse and contain many native as well as exotic species of grasses, sedges, and forbs. Exotic forbs include the legumes *Lespedeza cuneata*, *Trifolium campestre*, *Trifolium hybridum*, *Trifolium pratense*, and *Trifolium repens*, as well as *Achillea millefolium*, *Calystegia sepium*, *Daucus carota*, *Leucanthemum vulgare*, *Oxalis stricta*, and *Plantago lanceolata*. Common

native herbs include *Apocynum cannabinum*, *Desmodium canescens*, *Dichantherium clandestinum*, *Erigeron annuus*, *Fragaria virginiana*, *Potentilla simplex*, *Solanum carolinense*, *Solidago canadensis*, and *Verbesina occidentalis*. This vegetation is currently defined for the central and southern Appalachians, Ozarks, Ouachita Mountains, and parts of the Piedmont and Interior Low Plateau, but it is possible throughout much of the eastern United States and southern Canada.

### ENVIRONMENTAL DESCRIPTION

#### USFWS Wetland System:

**Chickamauga-Chattanooga National Military Park Environment:** This association is widespread at Chickamauga Battlefield in the numerous maintained pastures that are scattered throughout the park. Some of these have a fairly high percentage of native species but do not approach the condition of more natural grasslands such as found in Southern Ridge and Valley Patch Prairie (CES202.453). These areas are actively mowed and some are used for the production of hay.

**Global Environment:** This association includes grassland pastures and hayfields, more-or-less cultural, though sometimes no longer actively maintained. It occurs in areas which have been cleared in the past, including abandoned farmlands, strip mines, and other areas disturbed by human activities.

### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** The examples at Chickamauga-Chattanooga National Military Park are primarily dominated by *Lolium pratense* but also include a wide variety of non-native and native species, some of these perhaps relicts of original more widespread glade type vegetation. Other native grass and herbaceous species found here include *Tridens flavus*, *Tridens strictus*, *Panicum anceps*, *Paspalum floridanum*, *Setaria parviflora*, *Tripsacum dactyloides*, *Paspalum laeve*, *Ruellia humilis*, *Asclepias hirtella* (uncommon glade species), *Salvia lyrata*, and *Rudbeckia fulgida*. Typical non-native species commonly found here include *Sorghum halepense* (widespread), *Paspalum dilatatum*, *Digitaria sanguinalis*, *Leucanthemum vulgare*, and *Daucus carota*.

**Global Vegetation:** This association represents early-successional herbaceous and herb-shrub vegetation dominated by or having a large component of exotic grasses and legumes. The dominant species in this association are the European "tall or meadow fescues" (*Lolium* spp.). These communities are sometimes nearly monospecific but can also be very diverse and contain many native species of grasses, sedges, and forbs. Woody encroachment is restricted to low cover by *Toxicodendron radicans* and species of *Rubus*, both of which become more abundant in older stands. Scattered individuals of various shrubs may be present, including *Crataegus crus-galli*, *Fraxinus pennsylvanica*, *Fraxinus americana*, *Rosa multiflora*, *Robinia pseudoacacia*, *Cornus florida*, *Elaeagnus umbellata*, *Sambucus nigra* ssp. *canadensis*, and *Sassafras albidum*. In the Central Appalachians and northern Cumberlands, the dominant exotic grasses include *Agrostis gigantea*, *Dactylis glomerata*, *Holcus lanatus*, *Lolium pratense*, *Phleum pratense*, and *Poa pratensis*. Exotic forbs include the legumes *Lespedeza cuneata*, *Trifolium campestre*, *Trifolium hybridum*, *Trifolium pratense*, and *Trifolium repens*, as well as *Achillea millefolium*, *Calystegia sepium*, *Daucus carota*, *Leucanthemum vulgare*, *Oxalis stricta*, and *Plantago lanceolata*. Common native herbs include *Apocynum cannabinum*, *Desmodium canescens*, *Dichantherium clandestinum*, *Erigeron annuus*, *Fragaria virginiana*, *Potentilla simplex*, *Solanum carolinense*, *Solidago canadensis*, and *Verbesina occidentalis*. In the Black Belt region of Alabama and Mississippi, it is commonly found in mixture with *Paspalum dilatatum* (dallisgrass) (Bransby n.d.), and the exotic *Bromus tectorum* may be present in stands.

### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Herb (field)	Graminoid	<i>Lolium pratense</i>

#### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Herb (field)	Graminoid	<i>Agrostis gigantea</i> , <i>Phleum pratense</i>

### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Lolium pratense*

**Global:** *Achillea millefolium*, *Apocynum cannabinum*, *Calystegia sepium*, *Dactylis glomerata*, *Daucus carota*, *Desmodium canescens*, *Dichanthelium clandestinum*, *Erigeron annuus*, *Fragaria virginiana*, *Holcus lanatus*, *Lespedeza cuneata*, *Leucanthemum vulgare*, *Oxalis stricta*, *Plantago lanceolata*, *Poa pratensis*, *Potentilla simplex*, *Solanum carolinense*, *Solidago canadensis*, *Trifolium hybridum*, *Trifolium pratense*, *Trifolium repens*

#### OTHER NOTEWORTHY SPECIES

#### Chickamauga-Chattanooga National Military Park:

**Global:**

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** GNA (invasive) (5-Jan-2000). This vegetation is dominated by an exotic species, is of anthropogenic origin, and is thus not a conservation priority.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

#### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** *Lolium pratense* and *Lolium arundinaceum* are two closely related species which were traditionally treated as *Festuca pratensis* (= *Festuca elatior*) and *Festuca arundinacea*, and could alternately be treated as *Schedonorus pratensis* and *Schedonorus arundinaceus*. Conversion to Kartesz (1999) standard has necessitated the shift to the *Lolium* names from *Festuca*.

#### Global Similar Associations:

*Dactylis glomerata* - *Phleum pratense* - *Festuca* spp. - *Solidago* spp. Herbaceous Vegetation (CEGL006107)

*Schizachyrium scoparium* - *Solidago* spp. Herbaceous Vegetation (CEGL006333)

#### Global Related Concepts:

*Festuca pratensis* - (*Holcus lanatus*) - *Solidago canadensis* herbaceous vegetation (Vanderhorst 2001b) = Cleared Areas (Schmalzer and DeSelm 1982) B

#### OTHER COMMENTS

#### Other Comments:

#### ELEMENT DISTRIBUTION

**Chickamauga-Chattanooga National Military Park Range:** To date, this association has only been documented at Chickamauga Battlefield.

**Global Range:** This association is currently documented from the southern half of the Central Appalachians through the Gulf Coastal Plain and west to the Ozarks and Ouachitas. It is possible throughout much of the eastern United States.

**Nations:** US

**States/Provinces:** AL, AR, GA, KY, MD, MO, MS, NC, OK, SC, TN, VA, WV

**USFS Ecoregions:** 221Hc:CCC, 221He:CCC, 222Eg:CCC, 231Ae:CCC, 231Bh:CCC, M221Cb:CCC, M221Dc:CCC, M221Dd:CCC, M222Ab:CCC, M231A:CC

**Federal Lands:** NPS (Big South Fork, Blue Ridge Parkway, Buffalo River, Carl Sandburg Home, Chickamauga-Chattanooga, Cowpens, Cumberland Gap, Fort Donelson, Great Smoky Mountains, Guilford Courthouse, Kings Mountain, Lincoln Birthplace, Mammoth Cave, Natchez Trace, New River Gorge, Ninety Six, Obed, Russell Cave, Shiloh, Stones River, Thomas Stone, Vicksburg); USFS (Cherokee, Ouachita, Ouachita (Coastal Plain)?, Ouachita (Mountains), Ozark)

#### ELEMENT SOURCES

#### Chickamauga-Chattanooga National Military Park Inventory Notes:

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.04, CHCH.05, CHCH.11.

**Local Description Authors:** T. Govus

**Global Description Authors:** A.S. Weakley, mod. S.C. Gawler

**References:** Bransby n.d., Heath et al. 1973, Hoagland 2000, Kartesz 1999, NatureServe Ecology - Southeastern U.S. unpubl. data, Schmalzer and DeSelm 1982, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, Vanderhorst 2001b, Vanderhorst 2007

### **Rush Marsh**

*Juncus effusus* Seasonally Flooded Herbaceous Vegetation

Soft Rush Seasonally Flooded Herbaceous Vegetation

Identifier: CEGL004112

### **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	Seasonally flooded temperate or subpolar grassland (V.A.5.N.k.)
Alliance	<i>Juncus effusus</i> Seasonally Flooded Herbaceous Alliance (A.1375)
Alliance (English name)	Soft Rush Seasonally Flooded Herbaceous Alliance
Association	<i>Juncus effusus</i> Seasonally Flooded Herbaceous Vegetation
Association (English name)	Soft Rush Seasonally Flooded Herbaceous Vegetation
Association (Common name)	Rush Marsh

<b>Ecological System(s):</b>	East Gulf Coastal Plain Northern Depression Pondshore (CES203.558)
	East Gulf Coastal Plain Small Stream and River Floodplain Forest (CES203.559)
	South-Central Interior Small Stream and Riparian (CES202.706)
	Laurentian-Acadian Wet Meadow-Shrub Swamp (CES201.582)

### **ELEMENT CONCEPT**

**Global Summary:** This broadly defined type represents freshwater marsh vegetation dominated by *Juncus effusus*. Additional types may be developed as more information becomes available. This vegetation may occur in natural or artificial ponds, including beaver-enhanced ones. In various parts of its broad range as currently defined, associated species may include *Andropogon glomeratus*, *Cyperus* spp., *Typha latifolia*, *Scirpus cyperinus*, *Triadenum walteri*, *Apios americana*, and *Galium aparine*. This type includes seasonally to temporarily flooded vegetation dominated or codominated by *Juncus effusus* in the central and southern Appalachians.

### **ENVIRONMENTAL DESCRIPTION**

**USFWS Wetland System:** Palustrine

**Chickamauga-Chattanooga National Military Park Environment:**

**Global Environment:** This is a seasonally (to temporarily) flooded marsh vegetation type; it may occur in natural or artificial ponds, including beaver-enhanced ones.

### **VEGETATION DESCRIPTION**

**Chickamauga-Chattanooga National Military Park Vegetation:**

**Global Vegetation:** This type is currently broadly and literally defined, based on dominance by *Juncus effusus*. In various parts of its broad range as currently defined, associated species may include *Andropogon glomeratus*, *Carex* spp., *Cyperus* spp., other *Juncus* spp., *Typha latifolia*, *Scirpus cyperinus*, *Triadenum walteri*, *Apios americana*, and *Galium aparine*. In Georgia, Wharton (1978) cites *Carex rostrata*, *Carex stipata*, *Schoenoplectus pungens* (= *Scirpus americanus*), and *Sagittaria latifolia* as associates of beaver pond vegetation containing *Juncus effusus*.

**MOST ABUNDANT SPECIES****Chickamauga-Chattanooga National Military Park**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Global <u>Stratum</u> Herb (field)	<u>Lifeform</u> Graminoid	<u>Species</u> <i>Juncus effusus</i>

**CHARACTERISTIC SPECIES****Chickamauga-Chattanooga National Military Park:**

**Global:** *Juncus effusus*

**OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:**

**Global:**

**CONSERVATION STATUS RANK**

**Global Rank & Reasons:** G5 (28-Mar-2001). This is a broadly defined, widely distributed, and reasonably secure vegetation type.

**CLASSIFICATION**

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** Though this association was not seen at the Bankhead National Forest, it is expected to occur there.

**Global Similar Associations:****Global Related Concepts:**

Beaver Dam Type (Wharton 1978) ?  
IID6a. Natural Impoundment Pond (Allard 1990) B

**OTHER COMMENTS**

**Other Comments:**

**ELEMENT DISTRIBUTION****Chickamauga-Chattanooga National Military Park Range:**

**Global Range:** The range of this broadly defined association has not been fully described. It is confirmed as occurring in the Central Appalachians and is thought to occur in the Interior Low Plateau, Cumberland Plateau, Southern Ridge and Valley, Southern Blue Ridge, Piedmont, Chesapeake Bay Lowlands, and the Coastal Plain from the Mid-Atlantic to the Upper East Gulf Coastal Plain.

**Nations:** US

**States/Provinces:** AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA

**USFS Ecoregions:** 222Eb:CCC, 231Ca:CPP, 231Cd:CPP, 231Db:CCC, M221Ab:CCC, M221Dc:CCC, M221Dd:CCC

**Federal Lands:** DOD (Arnold, Fort Benning); NPS (Blue Ridge Parkway?, Carl Sandburg Home, Chickamauga-Chattanooga?, Great Smoky Mountains, Natchez Trace); USFS (Bankhead, Cherokee?, Oconee?, Talladega, Talladega (Oakmulgee), Talladega (Talladega)?)

## ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:****Chickamauga-Chattanooga National Military Park Plots:****Local Description Authors:**

**Global Description Authors:** Southeastern Ecology Group

**References:** Allard 1990, Fleming et al. 2001, Hoagland 1998c, Hoagland 2000, Peet et al. unpubl. data 2002, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, TNC 1998a, Wharton 1978

**Southern Woolgrass Bulrush Marsh**

*Scirpus cyperinus* Seasonally Flooded Southern Herbaceous Vegetation

Woolgrass Bulrush Seasonally Flooded Southern Herbaceous Vegetation

Identifier: CEGL003866

**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	Seasonally flooded temperate or subpolar grassland (V.A.5.N.k.)
Alliance	<i>Scirpus cyperinus</i> Seasonally Flooded Herbaceous Alliance (A.1386)
Alliance (English name)	Woolgrass Bulrush Seasonally Flooded Herbaceous Alliance
Association	<i>Scirpus cyperinus</i> Seasonally Flooded Southern Herbaceous Vegetation
Association (English name)	Woolgrass Bulrush Seasonally Flooded Southern Herbaceous Vegetation
Association (Common name)	Southern Woolgrass Bulrush Marsh

**Ecological System(s):** East Gulf Coastal Plain Small Stream and River Floodplain Forest (CES203.559)

## ELEMENT CONCEPT

**Global Summary:** This association is a semi-natural type, consisting of *Scirpus cyperinus* as an essentially monospecific stand, especially in artificial wetlands, such as borrow pits or ponds. The water table is at or above the soil surface for at least part of the growing season. The dominant species, *Scirpus cyperinus*, often forms dense, almost monotypic stands. *Carex* spp. and *Schoenoplectus* spp. (= *Scirpus* spp.) are often found in this community. Other co-occurring species of this association are not fully known. It is a widespread type. At Fort Benning, Georgia, *Scirpus cyperinus* occurs with *Saccharum giganteum*, *Juncus* sp., and occasional *Alnus serrulata* and *Nyssa biflora* in beaver ponds and other hydrologically enhanced areas. In the Interior Low Plateau of Tennessee, *Scirpus cyperinus* is commonly found with *Typha latifolia* in roadside ditches and on the margins of ponds and reservoirs.

## ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:** Palustrine

**Chickamauga-Chattanooga National Military Park Environment:**

**Global Environment:** At Fort Benning, Georgia, this is found in beaver ponds and other hydrologically enhanced areas. In the Interior Low Plateau of Tennessee, *Scirpus cyperinus* is commonly found with *Typha latifolia* in roadside ditches and on the margins of ponds and reservoirs. In the Francis Marion National Forest (South Carolina), *Scirpus cyperinus* sometimes dominates open depressions within or adjacent to the Santee River floodplain and larger stream floodplains, and can also dominate deeper borrow pits (Glitzenstein and Streng 2004).

## VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:**

**Global Vegetation:** Stands of this association consist of *Scirpus cyperinus* as an essentially monospecific stand. *Saccharum* spp., *Carex* spp., and *Schoenoplectus* spp. (= *Scirpus* spp.) are often found in this community, especially on the margins. Other co-occurring species of this association are not fully understood. In the Interior Low Plateau of Tennessee, *Scirpus cyperinus* is commonly found with *Typha latifolia*. In addition, *Juncus effusus* and an occasional *Alnus serrulata* are also present.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

##### Chickamauga-Chattanooga National Military Park:

Global:

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

Global:

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G4 (15-Oct-2002). This is a wide-ranging type that can be found in naturally occurring as well as artificial wetlands.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

##### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** This community may be at least a minor component of many Southeastern wetland systems, but little work has been done to determine its range and component species. The variability of this association across its range and its relation to related types in this alliance are not fully understood. At Arnold Air Force Base, Coffee and Franklin counties, Tennessee, this vegetation is related to that found scattered along the border of Woods Reservoir. This appears to be a component of a mosaic of communities which form bands from the edge of the reservoir to the surrounding forest. The band found at the reservoir's edge is dominated by *Scirpus cyperinus* and *Typha latifolia* [see CEGL004150 for the *Typha latifolia*-dominated phase]. *Juncus* sp., grasses, and an occasional *Alnus serrulata* are also present. The *Scirpus cyperinus* grows in dense clumps throughout the outer band. Similarly, at Fort Benning, Georgia, this community forms bands at the outer edge of hydrologically enhanced areas. On Fort Benning *Scirpus cyperinus* is found in conjunction with *Saccharum giganteum*, *Juncus* sp., and occasional *Alnus serrulata* and *Nyssa biflora*.

##### Global Similar Associations:

*Typha latifolia* Southern Herbaceous Vegetation (CEGL004150)

##### Global Related Concepts:

IID6a. Natural Impoundment Pond (Allard 1990) B

#### OTHER COMMENTS

**Other Comments:**

#### ELEMENT DISTRIBUTION

##### Chickamauga-Chattanooga National Military Park Range:

**Global Range:** This vegetation is possible throughout the southeastern United States.

**Nations:** US

**States/Provinces:** AL, AR?, FL?, GA, KY, LA?, MS?, NC?, SC, TN, VA?, WV?

**USFS Ecoregions:** 221H:PP, 221J:PP, 222Cf:CCP, 222Cg:CCP, 222Eb:CCC, 222Eg:CCP, 222Eh:CCP, 231A:PP, 232B:CC, 232C:CP, 232D:CP, 234A:PP, M221:P

**Federal Lands:** DOD (Fort Benning); NPS (Big South Fork, Chickamauga-Chattanooga?); USFS (Francis Marion, Oconee?, Talladega (Oakmulgee)?, Talladega (Talladega)?, Talladega?, Tuskegee?)

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:**

**Local Description Authors:**

**Global Description Authors:** M. Pyne

**References:** Allard 1990, Glitzenstein and Streng 2004, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

#### Piedmont/Mountain Semipermanent Impoundment (Montane Boggy Type)

*Sparganium americanum* - *Epilobium leptophyllum* Herbaceous Vegetation

American Bur-reed - Bog Willowherb Herbaceous Vegetation

Identifier: CEGL004510

#### 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	Seasonally flooded temperate or subpolar grassland (V.A.5.N.k.)
Alliance	<i>Sparganium americanum</i> Seasonally Flooded Herbaceous Alliance (A.1388)
Alliance (English name)	American Bur-reed Seasonally Flooded Herbaceous Alliance
Association	<i>Sparganium americanum</i> - <i>Epilobium leptophyllum</i> Herbaceous Vegetation
Association (English name)	American Bur-reed - Bog Willowherb Herbaceous Vegetation
Association (Common name)	Piedmont/Mountain Semipermanent Impoundment (Montane Boggy Type)
<b>Ecological System(s):</b> (CES202.018)	Central Interior Highlands and Appalachian Sinkhole and Depression Pond
	South-Central Interior Small Stream and Riparian (CES202.706)

#### ELEMENT CONCEPT

**Global Summary:** This vegetation occupies marshes and small streams with seasonal flooding, especially in areas currently or formerly flooded by beavers. *Sparganium americanum* strongly dominates the dense herb layer. Other species vary with geography and may include *Epilobium leptophyllum*, *Epilobium coloratum*, *Hypericum mutilum*, *Juncus effusus*, *Lycopus uniflorus*, *Polygonum punctatum*, *Potamogeton* sp., *Ludwigia palustris*, and others. A very sparse shrub layer may be present.

#### ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:** Palustrine

**Chickamauga-Chattanooga National Military Park Environment:** The example studied is associated with a small, natural depression pond with distinct zonal vegetation relating to water depth and hydrology. The *Sparganium*-dominated portion is located within the inner emergent herbaceous zone where seasonal inundation provides for saturated soils for almost all of the winter and most of the growing season. Soils are fine and mucky,

presumably basic, and the geologic substrate is assumed to be limestone. The elevation is 225 m (740 feet). These habitats may serve as important breeding sites for amphibians.

**Global Environment:** This vegetation occupies marshes and small streams with seasonal flooding, especially in areas currently or formerly flooded by beavers. In the Allegheny Mountains area, it occurs within northern hardwood or red spruce forest zones at 600 to 1000 m elevation. In Virginia, it is restricted to gentle, upper slope streamhead valleys above 1060 m (3500 feet) elevation, where it occurs in patch-mosaics with wet spruce forests, sphagnum seepage bogs, and open to scrubby meadows. Most sites were heavily altered by logging in the late 1800s through the early 1900s, and this disturbance may have altered the distribution, cover, and physiognomy of wetlands. Soils are variable and may consist of poorly to very poorly drained muck or organic-rich loamy soils of varying texture. Average depth of organic soil is 35 cm. Hydric soil indicators include Histosols, histic epipedon, hydrogen sulphide, 2-cm muck, depleted matrix, redox depressions, and iron/manganese masses. Soil pH averages 4.6 (n=5) and can be as low as 3.9. Soil chemistry is characterized by high Al, B, Fe, Na, S; moderate Ca, Cu, ENR, H, K, Mg, TEC, Zn; and low Mn, P, and organic matter (n=4).

#### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** This association is strongly dominated by *Sparganium americanum* with a mixture of other obligate herbaceous wetland species, including *Carex lupulina*, *Leersia oryzoides*, *Polygonum hydropiperoides*, *Ludwigia palustris*, *Boehmeria cylindrica*, *Potamogeton* sp., and *Eleocharis obtusa*.

**Global Vegetation:** Vegetation of this community type is almost entirely herbaceous, although some stands may have a sparse (<10%) shrub layer. *Sparganium americanum* strongly dominates the dense herb layer. Associated species include *Epilobium leptophyllum*, *Epilobium coloratum*, *Polygonum punctatum*, *Potamogeton* sp., *Ludwigia palustris*, and others. In the Allegheny Mountains, *Sparganium americanum* and *Scirpus expansus* dominate in variable proportions. Common associates include *Carex scoparia*, *Carex gynandra*, *Carex stipata*, *Epilobium leptophyllum*, *Glyceria melicaria*, *Glyceria striata*, *Hydrocotyle americana*, *Impatiens capensis*, *Poa palustris*, *Polygonum hydropiperoides*, *Polygonum sagittatum*, *Scirpus hattorianus*, *Scutellaria lateriflora*, *Solidago rugosa*, *Sphenopholis pensylvanica*, and *Symphyotrichum prenanthoides* (= *Aster prenanthoides*). More locally, *Glyceria grandis* is an abundant grass. In West Virginia, species (in addition to *Sparganium americanum*) with high constancy are *Juncus effusus*, *Galium tinctorium*, *Hypericum mutilum*, and *Lycopus uniflorus*; other common herbs include *Scirpus cyperinus* and other *Scirpus* spp. or *Schoenoplectus* spp., *Leersia oryzoides*, *Ludwigia palustris*, and *Carex lurida*.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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##### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
----------------	-----------------	----------------

#### CHARACTERISTIC SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:** *Carex gynandra*, *Carex scoparia*, *Carex stipata*, *Epilobium leptophyllum*, *Glyceria grandis*, *Hydrocotyle americana*, *Scirpus expansus*, *Sparganium americanum*

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:** *Aeshna canadensis*, *Aeshna tuberculifera*, *Aeshna verticalis*, *Arigomphus furcifer*, *Colias interior*, *Cordulegaster diastatops*, *Cordulia shurtleffii*, *Enallagma annexum*, *Enallagma hageni*, *Epithea canis*, *Gomphus borealis*, *Juncus brevicaudatus*, *Ladona julia*, *Lanthus parvulus*, *Lestes disjunctus*, *Leucorrhinia frigida*, *Leucorrhinia hudsonica*, *Nehalennia irene*, *Nemotaulius hostilis*, *Poa palustris*, *Rhionaeschna mutata*, *Somatochlora elongata*, *Somatochlora williamsoni*, *Sympetrum obtrusum*

### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G2G3 (1-Mar-2001). This association is known from only a few sites, each very small. It is dependent on periodic re-establishment by beaver flooding.

### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 3 - Weak

### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** Similar vegetation may occur in the Ridge and Valley of Virginia in abandoned beaver ponds. [See VDNH's Laurel Fork report, *Carex stipata* - *Sparganium americanum* subassociation (Fleming and Morehead 1996).]

### Global Similar Associations:

#### Global Related Concepts:

*Picea rubens* / *Vaccinium angustifolium* - *Epilobium leptophyllum* Association: *Carex stipata* - *Sparganium americanum* Subassociation (Fleming and Moorhead 1996) ?

*Sparganium americanum* - *Epilobium leptophyllum* Herbaceous Vegetation (Fleming and Coulling 2001) ?

*Sparganium americanum* - *Scirpus* spp. herbaceous wetland (Vanderhorst 2001b) =

IID6a. Natural Impoundment Pond (Allard 1990) B

Piedmont/Mountain Semipermanent Impoundment (Montane Boggy Subtype) (Schafale 1998b) ?

Strong *Sparganium americanum* marsh (Byers et al. 2007) =

### OTHER COMMENTS

#### Other Comments:

### ELEMENT DISTRIBUTION

**Chickamauga-Chattanooga National Military Park Range:** This association is only known from Chickamauga Battlefield.

**Global Range:** This community is known from a few high-elevation sites in the Southern Blue Ridge of North Carolina, the Southern Cumberland/ Ridge and Valley of Georgia, and the greater Allegheny Mountains area of Virginia and West Virginia.

**Nations:** US

**States/Provinces:** GA, NC, TN, VA:S1?, WV:S2

**USFS Ecoregions:** 231Da:CCC, M221Ba:CCC, M221Cb:CCC, M221Dc:CCC

**Federal Lands:** NPS (Chickamauga-Chattanooga, New River Gorge); USFS (George Washington, Monongahela, Pisgah); USFWS (Canaan Valley)

### ELEMENT SOURCES

#### Chickamauga-Chattanooga National Military Park Inventory Notes:

**Chickamauga-Chattanooga National Military Park Plots:** CHCH:03 (in part).

**Local Description Authors:** T. Govus

**Global Description Authors:** G. Fleming and P. Coulling, mod. S.C. Gawler

**References:** Allard 1990, Allard and Leonard 1952, Byers et al. 2007, Fleming and Coulling 2001, Fleming and Moorhead 1996, Fleming et al. 2001, Fleming et al. 2004, Hall 2005, Peet et al. unpubl. data 2002, Putnam 1995, Schafale 1998b, Schafale and Weakley 1990, Southeastern Ecology Working Group n.d., Suiter 1995, TDNH unpubl. data, Vanderhorst 2001b, Vanderhorst 2007

**Southern Cattail Marsh***Typha latifolia* Southern Herbaceous Vegetation

Broadleaf Cattail Southern Herbaceous Vegetation

Identifier: CEGL004150

**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	Semipermanently flooded temperate or subpolar grassland (V.A.5.N.I.)
Alliance	<i>Typha (angustifolia, latifolia)</i> - ( <i>Schoenoplectus</i> spp.) Semipermanently Flooded Alliance (A.1436)
Herbaceous	(Narrowleaf Cattail, Broadleaf Cattail) - (Clubrush species) Semipermanently Alliance
Flooded Herbaceous Alliance (English name)	
Association	<i>Typha latifolia</i> Southern Herbaceous Vegetation
Association (English name)	Broadleaf Cattail Southern Herbaceous Vegetation
Association (Common name)	Southern Cattail Marsh

**Ecological System(s):**

East Gulf Coastal Plain Northern Depression Pondshore (CES203.558)  
 East Gulf Coastal Plain Large River Floodplain Forest (CES203.489)  
 Atlantic Coastal Plain Embayed Region Tidal Freshwater Marsh (CES203.259)  
 Laurentian-Acadian Freshwater Marsh (CES201.594)  
 Red River Large Floodplain Forest (CES203.065)  
 Atlantic Coastal Plain Large River Floodplain Forest (CES203.066)  
 Central Interior Highlands and Appalachian Sinkhole and Depression Pond (CES202.018)  
 West Gulf Coastal Plain Large River Floodplain Forest (CES203.488)

**ELEMENT CONCEPT**

**Global Summary:** This association is a semi-natural type, consisting of *Typha latifolia* as an essentially monospecific stand, especially in artificial wetlands, such as borrow pits or ponds. The water table is at or above the soil surface for at least part of the growing season. The dominant species, *Typha latifolia*, often forms dense, almost monotypic stands. *Carex* spp. and *Schoenoplectus* spp. (= *Scirpus* spp.) are often found in this community, especially on the margins. Other co-occurring species of this association are not fully understood. It is a widespread type. In the Interior Low Plateau of Tennessee, *Typha latifolia* is commonly found with *Scirpus cyperinus* in roadside ditches and on the margins of ponds and reservoirs.

**ENVIRONMENTAL DESCRIPTION****USFWS Wetland System:** Palustrine**Chickamauga-Chattanooga National Military Park Environment:****Global Environment:** This type is found especially in artificial wetlands, such as borrow pits or ponds. The water table is at or above the soil surface for at least part of the growing season.**VEGETATION DESCRIPTION****Chickamauga-Chattanooga National Military Park Vegetation:****Global Vegetation:** Stands of this association consist of *Typha latifolia* as an essentially monospecific stand. *Carex* spp. and *Schoenoplectus* spp. (= *Scirpus* spp.) are often found in this community, especially on the margins. Other co-occurring species of this association are not fully understood. In the Interior Low Plateau of Tennessee, *Typha latifolia* is commonly found with *Scirpus cyperinus*. In addition, *Juncus effusus* and an occasional *Alnus serrulata* are also present.

**MOST ABUNDANT SPECIES****Chickamauga-Chattanooga National Military Park**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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**CHARACTERISTIC SPECIES****Chickamauga-Chattanooga National Military Park:**

Global:

**OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:**

Global:

**CONSERVATION STATUS RANK**

**Global Rank & Reasons:** G5 (14-Jun-2001). This is a wide-ranging type that includes naturally occurring and artificial wetlands.

**CLASSIFICATION****Status:** Standard**Classification Confidence:** 2 - Moderate**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** This community is a common element found in many Southeastern wetland systems, but little work has been done to determine its diagnostic features and component species. The variability of this association across its range and its relation to adjacent types in this and related alliances are not fully understood. At Arnold Air Force Base, Coffee and Franklin counties, Tennessee, this vegetation is found scattered along the border of Woods Reservoir. It appears to be a component of a mosaic of communities which form bands from the edge of the reservoir to the surrounding forest. The band found at the reservoir's edge is dominated by *Typha latifolia* and *Scirpus cyperinus*. *Juncus* sp., grasses, and an occasional *Alnus serrulata* are also present. The *Typha latifolia* grows patchily, being concentrated in dense clumps throughout the outer band.

**Global Similar Associations:***Scirpus cyperinus* Seasonally Flooded Southern Herbaceous Vegetation (CEGL003866)*Typha (angustifolia, domingensis, latifolia)* - *Schoenoplectus americanus* Herbaceous Vegetation (CEGL002032)*Typha (angustifolia, latifolia)* - (*Schoenoplectus* spp.) Eastern Herbaceous Vegetation (CEGL006153)*Typha (latifolia, angustifolia)* Western Herbaceous Vegetation (CEGL002010)*Typha* spp. - *Schoenoplectus acutus* - Mixed Herbs Midwest Herbaceous Vegetation (CEGL002229)*Typha* spp. Great Plains Herbaceous Vegetation (CEGL002389)**Global Related Concepts:**

IID6a. Natural Impoundment Pond (Allard 1990) B

L5D2aI2a. *Typha latifolia* (Foti et al. 1994) ?P5A4bII2a. *Typha latifolia* (Foti et al. 1994) ?**OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION****Chickamauga-Chattanooga National Military Park Range:****Global Range:** This vegetation is possible throughout the southeastern United States.**Nations:** US

**States/Provinces:** AL, AR, FL?, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA, WV

**USFS Ecoregions:** 221:C, 222Ab:CCC, 222Ag:CCC, 222Ah:CCC, 222An:CCC, 222Cf:CCP, 222Cg:CCP, 222Eb:CCC, 222Eg:CCP, 222Eh:CCP, 231A:C?, 231Fb:CCC, 231Ga:CCC, 231Gb:CCC, 231Gc:CCC, 232:C, 234Aa:CCC, 234Ac:CCC, 234Ad:CCC, 234Af:CCC, 234Ag:CCC, 234Ai:CCC, 234Al:CCC, 234Am:CCC, 234An:CCC, 251:P, 255Da:CCC, 255Dc:CCC, M221:C, M222Aa:CCC, M222Ab:CCC, M231Aa:CCC, M231Ab:CCC, M231Ac:CCC, M231Ad:CCC

**Federal Lands:** DOD (Arnold, Fort Benning); NPS (Chickamauga-Chattanooga?, Ninety Six); USFS (Daniel Boone?, Kisatchie, Oconee?, Ouachita, Ouachita (Mountains), Ozark, Talladega (Oakmulgee)?, Talladega (Talladega)?, Talladega?, Tuskegee?); USFWS (Anahuac, Brazoria, Reelfoot, San Bernard)

#### ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:**

**Local Description Authors:**

**Global Description Authors:** L.M. Smith, A.S. Weakley and J.E. Mohan, mod. K.D. Patterson

**References:** Allard 1990, Blair and Hubbell 1938, Foti 1994b, Foti et al. 1994, Grace and Wetzel 1981, Hoagland 2000, McCoy 1958, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, TNC 1998a

#### Limestone Seep Glade

*Eleocharis compressa* - *Schoenolirion croceum* - *Carex crawei* - *Allium cernuum* Herbaceous Vegetation

Flat-stem Spikerush - Yellow Sunnybell - Crawe's Sedge - Nodding Onion Herbaceous Vegetation

Identifier: CEGL004169

#### 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	Saturated temperate or subpolar grassland (V.A.5.N.m.)
Alliance	<i>Eleocharis compressa</i> - <i>Nothoscordum bivalve</i> Saturated Herbaceous Alliance
(A.1458)	
Alliance (English name)	Flat-stem Spikerush - Grace-garlic Saturated Herbaceous Alliance
Association	<i>Eleocharis compressa</i> - <i>Schoenolirion croceum</i> - <i>Carex crawei</i> - <i>Allium cernuum</i>
Herbaceous	
	Vegetation
Association (English name)	Flat-stem Spikerush - Yellow Sunnybell - Crawe's Sedge - Nodding Onion
Herbaceous Vegetation	
Association (Common name)	Limestone Seep Glade

**Ecological System(s):** Nashville Basin Limestone Glade and Woodland (CES202.334)

#### ELEMENT CONCEPT

**Global Summary:** This herbaceous seepage community is a zonal component of Central Basin (Tennessee) and Moulton Valley (Alabama) Limestone Cedar Glades. Examples are dominated by *Eleocharis compressa*, *Schoenolirion croceum*, *Carex crawei*, and *Allium cernuum*. Other characteristic species include *Nothoscordum bivalve*, *Isoetes butleri* and *Hypoxis hirsuta*. This vegetation is supported by seepage of groundwater from unconfined aquifers during winter and spring. Tennessee occurrences are on Ordovician limestone, Alabama ones on Mississippian Bangor limestone. Alabama Moulton Valley examples are apparently associated with *Juniperus virginiana* / *Schizachyrium scoparium* - (*Andropogon gerardii*, *Sorghastrum nutans*) - *Silphium (trifoliatum)*,

*terebinthaceum*) Wooded Herbaceous Vegetation (CEGL004738). In contrast, Tennessee Central Basin examples are associated with *Sporobolus (neglectus, vaginiflorus) - Aristida longispica - Panicum flexile - Panicum capillare* Herbaceous Vegetation (CEGL004340), an annual grass glade type.

#### ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:** Palustrine

**Chickamauga-Chattanooga National Military Park Environment:** This vegetation is associated with spring-fed seepage areas within the glade complex at Chickamauga Battlefield. The substrates for these seeps are dolomites and limestones of the Knox and Chickamauga groups. Many of the glades are located in low-lying positions and have active seeps for much of the growing season. Often the seeps are located within fissures of fractured limestone. Elevations range between 220 and 230 m (720-750 feet).

**Global Environment:** Patches are kept moist in spring by seepage from limestone groundwater. This community is found on flat to gently sloping terrain at about 214 m (700 feet) elevation on limestones of the Central (or Nashville) Basin in central Tennessee, as well as in the Moulton Valley of Alabama and glades of Chickamauga-Chattanooga National Military Park. Examples are found in a lower slope position than drier limestone glade communities and are associated with lateral seepage or flow (particularly during spring) of mineral-rich circumneutral waters from adjoining limestone strata. In central Tennessee, this situation apparently occurs frequently at the interface between the Lebanon and the underlying Ridley limestones, both of Ordovician age.

#### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** This is a small-patch association within the greater glade complex and occurs in association with seepage areas. *Eleocharis compressa* is a conspicuous dominant and occurs along with *Nothoscordum bivalve*, *Carex crawei*, and *Allium cernuum*. *Leavenworthia exigua* var. *exigua* is an associate in some examples.

**Global Vegetation:** This community is dominated by herbaceous monocots with narrow, linear leaves, from 2-3 dm tall. Dominant plants include *Schoenolirion croceum*, *Eleocharis compressa*, *Nothoscordum bivalve* (spring-blooming), and *Allium cernuum* (summer-blooming). *Carex crawei* is present in most examples, but is also found in the absence of some of the other nominal species.

#### MOST ABUNDANT SPECIES

**Chickamauga-Chattanooga National Military Park**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Herb (field)	Graminoid	<i>Carex crawei</i> , <i>Eleocharis compressa</i>

**Global**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Allium cernuum*, *Carex crawei*, *Eleocharis compressa*, *Nothoscordum bivalve*

**Global:**

#### OTHER NOTEWORTHY SPECIES

**Chickamauga-Chattanooga National Military Park:**

**Global:**

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G2? (31-Dec-1997). This saturated herbaceous association is restricted in range, fragile and vulnerable to threats at different scales, highly specific in habitat preference. It is only known from seasonal seepage areas in limestone glades in the Central Basin of Tennessee and the Moulton Valley of Alabama. Only a few extensive, high-quality examples are known. Remaining unprotected examples are vulnerable to overgrazing, damage from off-road vehicles, local hydrologic changes, and land use change (including housing development) in these areas of extensive human population growth.

**CLASSIFICATION****Status:** Standard**Classification Confidence:** 2 - Moderate**Chickamauga-Chattanooga National Military Park Comments:** Examples here lack *Schoenolirion croceum* but otherwise are representative of this association type.**Global Comments:** More information is needed on any differences in composition between Tennessee and Alabama examples.**Global Similar Associations:****Global Related Concepts:****OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION****Chickamauga-Chattanooga National Military Park Range:** This association is restricted to the cedar glade complex of Chickamauga Battlefield.**Global Range:** This vegetation type is restricted to limestone glade regions of the Central Basin of Tennessee (222Ed), the Moulton Valley of Alabama (231Ce) and the Chert Valley (231Da).**Nations:** US**States/Provinces:** AL, GA, TN**USFS Ecoregions:** 222Ed:CCC, 231Ce:CCC, 231Da:CCC**Federal Lands:** NPS (Chickamauga-Chattanooga, Stones River); USFS (Bankhead)**ELEMENT SOURCES****Chickamauga-Chattanooga National Military Park Inventory Notes:****Chickamauga-Chattanooga National Military Park Plots:** CHCH.21 (in part).**Local Description Authors:** T. Govus**Global Description Authors:** M. Pyne**References:** Hilton 1997, Rollins 1997, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data**Central Limestone Glade***Quercus muehlenbergii* - *Juniperus virginiana* / *Schizachyrium scoparium* - *Manfreda virginica* Wooded Herbaceous Vegetation

Chinquapin Oak - Eastern Red-cedar / Little Bluestem - Eastern Agave Wooded Herbaceous Vegetation

Identifier: CEGL005131

**NVC Classification**

Physiognomic Class	Herbaceous Vegetation (V)
Physiognomic Subclass	Perennial graminoid vegetation (V.A.)
Physiognomic Group	Temperate or subpolar grassland with a sparse tree layer (V.A.6.)
Physiognomic Subgroup (V.A.6.N.)	Natural/Semi-natural temperate or subpolar grassland with a sparse tree layer
Formation	Bedrock temperate or subpolar grassland with a sparse tree layer (V.A.6.N.q.)

Alliance	( <i>Juniperus virginiana</i> ) / <i>Schizachyrium scoparium</i> - ( <i>Bouteloua curtipendula</i> )
Wooded Herbaceous	
Alliance (English name)	Alliance (A.1919) (Eastern Red-cedar) / Little Bluestem - (Sideoats Grama) Wooded Herbaceous
Association	<i>Quercus muehlenbergii</i> - <i>Juniperus virginiana</i> / <i>Schizachyrium scoparium</i> - <i>Manfreda virginica</i>
Association (English name)	Wooded Herbaceous Vegetation Chinquapin Oak - Eastern Red-cedar / Little Bluestem - Eastern Agave Wooded Herbaceous
Association (Common name)	Vegetation Central Limestone Glade
<b>Ecological System(s):</b>	Central Interior Highlands Calcareous Glade and Barrens (CES202.691) Nashville Basin Limestone Glade and Woodland (CES202.334) Central Appalachian Alkaline Glade and Woodland (CES202.602) Ridge and Valley Calcareous Valley Bottom Glade and Woodland (CES202.024)

### ELEMENT CONCEPT

**Global Summary:** This limestone glade or barrens community is found in the central and eastern United States. Stands occur on gentle to steep slopes of hills, knobs, ridges, bluffs along streams, and broad terraces. Aspect is variable, but this vegetation is generally best developed on southern and western exposures. Parent material is limestone, cherty limestone, dolomite, or calcareous shale which is exposed at the surface, resulting in a very shallow, well-drained substrate. Soils are neutral to alkaline, shallow to moderately deep, and contain a homogenous mixture of rock fragments of various sizes. Herbaceous cover is very uneven, ranging from very dense in some areas to absent in others. Some dominant or characteristic grasses include *Schizachyrium scoparium*, *Sorghastrum nutans*, *Aristida* spp., and *Sporobolus compositus*. In deeper soil areas *Andropogon gerardii* may be present. At some sites *Bouteloua curtipendula* is present, but it may be rare or absent at others. Forbs vary in dominance by site and include *Asclepias verticillata*, *Comandra umbellata*, *Coreopsis tripteris*, *Croton monanthogynus*, *Echinacea simulata*, *Galactia regularis*, *Hexaletris spicata*, *Helianthus divaricatus*, *Helianthus hirsutus*, *Hypericum dolabriforme*, *Hypericum sphaerocarpaceum*, *Euphorbia corollata*, *Gaura* spp., *Lespedeza hirta*, *Lespedeza virginica*, *Liatris aspera*, *Liatris cylindracea*, *Liatris squarrosa*, *Leavenworthia exigua* var. *exigua*, *Lithospermum canescens*, *Lobelia spicata* (var. *leptostachys*), *Manfreda virginica*, *Matelea obliqua*, *Ophioglossum engelmannii*, *Physostegia virginiana*, *Ratibida pinnata*, *Rudbeckia hirta*, *Ruellia humilis*, *Sabatia angularis*, *Scutellaria parvula*, *Silphium trifoliatum*, *Solidago nemoralis*, *Verbesina helianthoides*, *Verbesina virginica*, and *Zizia aptera*. *Quercus muehlenbergii* and *Juniperus virginiana* var. *virginiana* can form a sparse canopy. *Quercus stellata* may be common in parts of the range. Other scattered trees which may be present include *Cercis canadensis*, *Fraxinus quadrangulata*, *Quercus velutina*, *Quercus alba*, *Quercus marilandica*, and *Liriodendron tulipifera*. The subcanopy is absent or very sparse. Commonly encountered shrubs include *Celtis tenuifolia*, *Cornus florida*, *Ulmus alata*, *Rhus aromatica*, *Rhus copallinum*, and *Symphoricarpos orbiculatus*. This vegetation may exist as more extensive areas, or in some southeastern cases, it may be limited to a more narrow zone between vegetation dominated by woody plants and that dominated by annual grasses.

### ENVIRONMENTAL DESCRIPTION

#### USFWS Wetland System:

**Chickamauga-Chattanooga National Military Park Environment:** At Chickamauga-Chattanooga National Military Park, these glade complexes occur as a mosaic scattered from north to south along the eastern side of Chickamauga Battlefield (east of US 27). Sites are on exposed areas of dolomites and limestones of the Chickamauga and Knox groups (Ordovician limestones), often located on low topographic positions near streams and typically including fractured rock with seepage areas. These sites are very wet during periods of heavy rainfall in the winter and are extremely dry during the hottest part of the growing season (especially during periods of drought). Microhabitats occur as a result of the amount of exposure to sun, the shape and amount of exposure of bedrock, and also the degree of fragmentation of the limestone and depth of soil. Human impacts, including some from horseback riding, have had some deleterious effects on the vegetation.

**Global Environment:** This community occurs on gentle to steep slopes of hills, knobs, ridges, bluffs along streams, and broad terraces. Aspect is variable, but the community is generally best developed on southern and western exposures. Parent material is limestone, cherty limestone, dolomite, or calcareous shale which is exposed at the surface, resulting in a very shallow, well-drained substrate. Soils are neutral to alkaline, shallow to moderately deep, and contain a homogenous mixture of rock fragments of various sizes. They can erode easily, partly due to freeze-thaw and subsequent mass wasting (TNC 1995a).

### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** These glades tend to be very heterogeneous depending upon the degree of exposure of the limestone and amount of soil development. Almost all include stunted, patchy *Juniperus virginiana* var. *virginiana* along with scattered small *Fraxinus americana*, *Diospyros virginiana*, *Quercus shumardii*, *Quercus muehlenbergii*, *Celtis occidentalis*, and *Cercis canadensis*. A sparse low-shrub layer is also usually patchy in nature. This may include *Sideroxylon lycioides*, *Ulmus alata*, *Rhus aromatica*, *Frangula caroliniana*, and *Symphoricarpos orbiculatus*. Herbaceous cover is varied, with some sites reaching 90% cover by grasses and herbaceous species and others <50%. All sites include some amount of bare limestone, however, this may have a thin cover of lichens, mosses or algae. The dominant grass for many glades is *Schizachyrium scoparium*, but a great number of other grass and herbaceous species are usually present. Typical grass species may include *Bouteloua curtipendula*, *Andropogon gerardii*, *Sporobolus vaginiflorus*, *Sporobolus clandestinus*, *Sorghastrum nutans*, *Andropogon gyrans*, *Aristida purpurascens*, and in one example *Sporobolus heterolepis*. Many of the herbaceous species are endemic to the glade environment or have affinities to prairie environments. Examples of these are *Ratibida pinnata*, *Hypericum dolabriforme*, *Croton monanthogynus*, *Scutellaria parvula*, *Spiranthes magnicamporum*, *Isanthus brachiatus*, *Leavenworthia exigua* var. *exigua*, *Pediomelum subacaule*, *Linum sulcatum*, *Packera paupercula*, *Asclepias viridis*, *Carex crawei*, *Dalea gattingeri*, *Ruellia humilis*, *Ophioglossum engelmannii*, *Viola egglestonii*, and *Silphium pinnatifidum*. Other characteristic species found in these glades include *Eurybia hemispherica*, *Physostegia virginiana*, *Lobelia spicata*, *Lithospermum canescens*, *Asclepias verticillata*, *Houstonia canadensis*, *Houstonia longifolia*, *Manfreda virginica*, *Senna marilandica*, *Sericocarpus linifolius*, and *Salvia lyrata*. This association bears a close affinity to cedar glades known from the Central Basin of Tennessee. It represents without question the most biologically significant community located at Chickamauga-Chattanooga National Military Park.

**Global Vegetation:** Herbaceous cover is very uneven, ranging from very dense in some areas to absent in others. Some dominant or characteristic grasses include *Schizachyrium scoparium*, *Sorghastrum nutans*, *Aristida* spp., and *Sporobolus compositus*. In deeper soil areas *Andropogon gerardii* may be present. At some sites *Bouteloua curtipendula* is present, but it may be rare or absent at others. Forbs vary in dominance by site and include *Asclepias verticillata*, *Comandra umbellata*, *Coreopsis tripteris*, *Croton monanthogynus*, *Echinacea simulata*, *Galactia regularis*, *Hexalectris spicata*, *Helianthus divaricatus*, *Helianthus hirsutus*, *Hypericum dolabriforme*, *Hypericum sphaerocarpum*, *Euphorbia corollata*, *Gaura* spp., *Lespedeza hirta*, *Lespedeza virginica*, *Liatris aspera*, *Liatris cylindracea*, *Liatris squarrosa*, *Lithospermum canescens*, *Lobelia spicata* var. *leptostachys*, *Manfreda virginica*, *Matelea obliqua*, *Ophioglossum engelmannii*, *Physostegia virginiana*, *Ratibida pinnata*, *Rudbeckia hirta*, *Ruellia humilis*, *Sabatia angularis*, *Scutellaria parvula*, *Silphium trifoliatum*, *Solidago nemoralis*, *Verbesina helianthoides*, *Verbesina virginica*, and *Zizia aptera*. *Quercus muehlenbergii* and *Juniperus virginiana* var. *virginiana* can form a sparse canopy. *Quercus stellata* may be common in parts of the range. Other scattered trees which may be present include *Cercis canadensis*, *Fraxinus quadrangulata*, *Quercus velutina*, *Quercus alba*, *Quercus marilandica*, and *Liriodendron tulipifera*. The subcanopy is absent or very sparse. Commonly encountered shrubs include *Celtis tenuifolia*, *Cornus florida*, *Ulmus alata*, *Rhus aromatica*, *Rhus copallinum*, and *Symphoricarpos orbiculatus*. This vegetation may exist as more extensive areas, or in some southeastern cases, it may be limited to a more narrow zone between vegetation dominated by woody plants and that dominated by annual grasses (TNC 1995a, D. Minney pers. comm. 2000).

### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

##### Stratum

Tree canopy  
Herb (field)

##### Lifeform

Needle-leaved tree  
Graminoid

##### Species

*Juniperus virginiana* var. *virginiana*  
*Schizachyrium scoparium*

#### Global

**Stratum**

Tree canopy  
 Tree canopy  
 Tree subcanopy  
 Shrub/sapling (tall & short)  
 Short shrub/sapling  
 Herb (field)  
 Herb (field)

**Lifeform**

Needle-leaved tree  
 Broad-leaved deciduous tree  
 Broad-leaved deciduous tree  
 Vine/Liana  
 Succulent shrub  
 Forb *Helianthus divaricatus*  
 Graminoid

**Species**

*Juniperus virginiana*  
*Quercus muehlenbergii*, *Quercus stellata*  
*Cercis canadensis*  
*Smilax bona-nox*  
*Manfreda virginica*  
  
*Andropogon gerardii*, *Schizachyrium scoparium*,  
*Sorghastrum nutans*

**CHARACTERISTIC SPECIES**

**Chickamauga-Chattanooga National Military Park:** *Andropogon gerardii*, *Andropogon gyrans*, *Asclepias viridis*, *Bouteloua curtipendula*, *Carex crawei*, *Cercis canadensis*, *Croton monanthogynus*, *Dalea gattingeri*, *Frangula caroliniana*, *Fraxinus americana*, *Hypericum dolabriforme*, *Juniperus virginiana* var. *virginiana*, *Leavenworthia exigua* var. *exigua*, *Linum sulcatum*, *Ophioglossum engelmannii*, *Packera paupercula*, *Pediomelum subacaule*, *Quercus muehlenbergii*, *Quercus stellata*, *Ratibida pinnata*, *Rhus aromatica*, *Ruellia humilis*, *Schizachyrium scoparium*, *Scutellaria parvula*, *Sideroxylon lycioides*, *Sorghastrum nutans*, *Spiranthes magnicamporum*, *Sporobolus clandestinus*, *Symphoricarpos orbiculatus*, *Viola egglesonii*

**Global:****OTHER NOTEWORTHY SPECIES**

**Chickamauga-Chattanooga National Military Park:** *Bouteloua curtipendula*, *Dalea gattingeri*, *Hypericum dolabriforme*, *Leavenworthia exigua* var. *exigua*, *Pediomelum subacaule*, *Sporobolus heterolepis*, *Sporobolus vaginiflorus*, *Trichostema brachiatum*

**Global:** *Agkistrodon contortrix*, *Aimophila aestivalis*, *Archilochus colubris*, *Aspidoscelis sexlineata*, *Astragalus crassicaarpus* var. *trichocalyx*, *Astragalus distortus*, *Berchemia scandens*, *Berlandiera betonicifolia*, *Bombycilla cedrorum*, *Chondestes grammacus*, *Colaptes auratus*, *Cotinus obovatus*, *Cyanocitta cristata*, *Delphinium alabamicum*, *Dendroica discolor*, *Echinacea simulata*, *Erysimum capitatum*, *Galium arkansanum*, *Hypericum dolabriforme*, *Lampropeltis calligaster*, *Lanius ludovicianus*, *Leavenworthia crassa*, *Leavenworthia uniflora*, *Meleagris gallopavo*, *Odocoileus virginianus*, *Passerina cyanea*, *Polygala senega*, *Sayornis phoebe*, *Sceloporus undulatus*, *Sciurus carolinensis*, *Sialia sialis*, *Thryomanes bewickii*, *Thryothorus ludovicianus*, *Toxostoma rufum*, *Trimerotropis saxatilis*, *Zizia aptera*

**CONSERVATION STATUS RANK**

**Global Rank & Reasons:** G2G3 (2-Nov-1999). There are probably over 100 occurrences rangewide. Eighty-three have been documented: 32 in Illinois (S2), 48 in Indiana (S2S3), and 3 in Ohio (S2). Although no other occurrences are documented, the community is also reported in Alabama, Georgia, Kentucky, Tennessee, West Virginia, and Virginia (all S?). It is found in 15 ecoregional subsections. The present range of this community is probably very close to its presettlement range, but lack of fire permits increased dominance by woody species.

**CLASSIFICATION**

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** In Indiana, *Quercus stellata* is typical, *Bouteloua curtipendula* is rare, and *Sorghastrum nutans* is common. In Illinois, *Sorghastrum nutans* is more common than *Bouteloua curtipendula*. This type was developed in the Midwest and attributed to various southeastern states. Its relation to other eastern and southeastern alkaline glades needs further investigation. In Tennessee, this community might be called a limestone barren, as the term "glade" is restricted to bedrock-defined openings that are mostly flat, pavement-like, and dominated by annual grasses rather than perennial ones. In Indiana, this community is commonly called a cedar glade because stands of *Juniperus virginiana* border many of the sites of the community. *Juniperus virginiana*, which occurs with *Quercus stellata*, was probably rare in this community before the time of European settlement and consequent fire suppression. *Quercus muehlenbergii* - *Quercus (alba, velutina)* - (*Juniperus virginiana* var. *virginiana*) Bluff

Woodland (CEGL002144) is the more northern equivalent of this type. In southeastern Ohio, this type also contains a distinctive zone tracked as a separate type, the *Juniperus virginiana* / *Schizachyrium scoparium* - *Silphium terebinthinaceum* var. *luciae-brauniae* - *Carex juniperorum* - *Castilleja coccinea* Wooded Herbaceous Vegetation (CEGL004464).

In the Ozark Hills region of southern Illinois, a variant of this type occurs on very steep slopes. The herbaceous layer is quite variable because of soil erosion.

**Global Similar Associations:**

*Juniperus virginiana* / *Schizachyrium scoparium* - *Silphium terebinthinaceum* var. *luciae-brauniae* - *Carex juniperorum* - *Castilleja coccinea* Wooded Herbaceous Vegetation (CEGL004464)--is a zonal component within this type.

*Quercus muehlenbergii* - *Quercus (alba, velutina)* - (*Juniperus virginiana* var. *virginiana*) Bluff Woodland (CEGL002144)--is the more northern equivalent of this type.

*Quercus muehlenbergii* Woodland [Placeholder] (CEGL003704)

*Quercus stellata* - *Quercus marilandica* - *Quercus velutina* - *Carya texana* / *Schizachyrium scoparium* Woodland (CEGL002149)

*Quercus stellata* - *Quercus marilandica* / *Schizachyrium scoparium* Wooded Herbaceous Vegetation (CEGL002391)

**Global Related Concepts:**

*Juniperus virginiana* / *Schizachyrium scoparium* - *Bouteloua curtipendula* - *Sisyrinchium albidum* - *Packera millefolia* Wooded Herbaceous Vegetation (Fleming pers. comm.) ?

Barrens type (Hutchison 1994) ?

Barrens type (Hutchison et al. 1986) ?

Central and Eastern Grassland and Forest Combinations: 83: Cedar Glades (*Quercus-Juniperus-Sporobolus*) (Kuchler 1964) B

Eastern Redcedar: 46 (Eyre 1980) B

Post Oak - Blackjack Oak: 40 (Eyre 1980) B

Terrestrial: Savanna (TNC 1985) B

UNESCO FORMATION CODE: V.B.1c (UNESCO 1973) B

Xeric Limestone Prairie (Baskin et al. 1994) ?

**OTHER COMMENTS**

**Other Comments:**

**ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This association is restricted to the eastern portion of Chickamauga Battlefield.

**Global Range:** This limestone glade or barrens community is found in the central and eastern United States, ranging from southern Illinois, Kentucky, Tennessee and Alabama, east to Georgia, western Virginia, West Virginia, and Ohio.

**Nations:** US

**States/Provinces:** AL, GA, IL:S2, IN:S2S3, KY, OH, TN, VA, WV

**USFS Ecoregions:** 221Ec:CCC, 222Aq:CCC, 222De:CCC, 222Df:CCC, 222Dh:CCC, 222Di:CCC, 222Ei:CCC, 222Ek:CCC, 222El:CCC, 222Fc:CCC, 222Fd:CCC, 222Fe:CCC, 231Da:CCC, 251Cf:CCC, 251Ci:CCC

**Federal Lands:** DOD (J. Percy Priest?); NPS (Chickamauga-Chattanooga, Lincoln Birthplace, Mammoth Cave, Stones River); TVA (Columbia); USFS (Bankhead?)

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH:16, CHCH:19, CHCH:21, CHCH:51.

**Local Description Authors:** T. Govus

**Global Description Authors:** M. Guetersloh

**References:** Baskin and Baskin 1982, Baskin et al. 1994, Evans 1991, Eyre 1980, Fleming et al. 2001, Fleming pers. comm., Fralish 1987, Heikens and Robertson 1994, Heikens et al. 1994, Homoya 1994, Homoya et al. 1988, Hutchison 1994, Hutchison et al. 1986, Kuchler 1964, Midwestern Ecology Working Group n.d., Minney pers. comm., Nelson 1985, Quarterman and Powell 1978, Schotz pers. comm., TDNH unpubl. data, TNC 1985, TNC 1995a, UNESCO 1973, Voigt and Mohlenbrock 1964, White and Madany 1978

**Smartweed - Cutgrass Beaver Pond**

*Polygonum (hydropiperoides, punctatum) - Leersia (lenticularis, virginica)* Herbaceous Vegetation

(Swamp Smartweed, Dotted Smartweed) - (Catchfly Cutgrass, White Cutgrass) Herbaceous Vegetation

Identifier: CEGL004290

**NVC Classification**

Physiognomic Class	Herbaceous Vegetation (V)
Physiognomic Subclass	Perennial forb vegetation (V.B.)
Physiognomic Group	Temperate or subpolar perennial forb vegetation (V.B.2.)
Physiognomic Subgroup	Natural/Semi-natural temperate or subpolar perennial forb vegetation (V.B.2.N.)
Formation	Seasonally flooded temperate perennial forb vegetation (V.B.2.N.h.)
Alliance (A.1881)	<i>Polygonum</i> spp. (section <i>Persicaria</i> ) Seasonally Flooded Herbaceous Alliance
Alliance (English name)	Smartweed species Seasonally Flooded Herbaceous Alliance
Association Herbaceous	<i>Polygonum (hydropiperoides, punctatum) - Leersia (lenticularis, virginica)</i> Vegetation (Swamp Smartweed, Dotted Smartweed) - (Catchfly Cutgrass, White Cutgrass)
Association (English name) Herbaceous	Vegetation Smartweed - Cutgrass Beaver Pond
Association (Common name)	Smartweed - Cutgrass Beaver Pond
<b>Ecological System(s):</b>	East Gulf Coastal Plain Small Stream and River Floodplain Forest (CES203.559) East Gulf Coastal Plain Northern Depression Pondshore (CES203.558) South-Central Interior Small Stream and Riparian (CES202.706)

**ELEMENT CONCEPT**

**Global Summary:** This association incorporates vegetation of beaver ponds and other semipermanent impoundments in the Piedmont, South Atlantic Coastal Plain, Upper East Gulf Coastal Plain, scattered localities in the Blue Ridge, and possibly other adjacent provinces. Stands of this vegetation are dominated by some combination of *Polygonum punctatum*, *Polygonum hydropiperoides*, *Leersia lenticularis*, and/or *Leersia virginica*. Other herbaceous species present include *Saururus cernuus*, *Proserpinaca* sp., *Bidens aristosa* (= *Bidens polylepis*), and *Xanthium strumarium*. Scattered individuals of *Cephalanthus occidentalis* and *Acer saccharinum* may be present. A Piedmont North Carolina example contains *Impatiens capensis*, *Boehmeria cylindrica*, and the exotic *Murdannia keisak*.

**ENVIRONMENTAL DESCRIPTION**

**USFWS Wetland System:** Palustrine

**Chickamauga-Chattanooga National Military Park Environment:** This association occurs as a component of a small natural limesink depression pond at Chickamauga Battlefield. This site is filled by winter rains and most probably becomes dry during the end of the hottest part of the growing season. There is a well-developed emergent herbaceous zone, and mucky soils stay saturated for most of the year.

**Global Environment:** This association incorporates vegetation of beaver ponds and other semipermanent impoundments.

### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** This association occurs as a dense zone of emergent herbaceous plants dominated by a combination of *Polygonum punctatum*, *Polygonum hydropiperoides*, and *Leersia oryzoides*. Other species located within this zone include *Boehmeria cylindrica*, *Sparganium americanum*, *Eleocharis obtusa*, and *Ludwigia palustris*.

**Global Vegetation:** Stands of this vegetation are dominated by some combination of *Polygonum punctatum*, *Polygonum hydropiperoides*, *Leersia lenticularis*, and/or *Leersia virginica*. Other herbaceous species which may be present include *Polygonum densiflorum*, *Saururus cernuus*, *Proserpinaca* sp., *Sparganium americanum*, *Typha latifolia*, *Scirpus cyperinus*, *Lobelia cardinalis*, *Onoclea sensibilis*, *Penthorum sedoides*, *Boehmeria cylindrica*, *Sambucus canadensis*, *Bidens aristosa* (= *Bidens polylepis*), and *Xanthium strumarium*. Scattered individuals of *Cephalanthus occidentalis* and *Acer saccharinum* or other woody plants may be present. Examples which have become dried-out (through drought and/or beaver dam failure) may exhibit greater dominance by *Leersia* rather than *Polygonum*. The combination of *Polygonum punctatum* - *Leersia virginica* was first noted, but the combination of *Polygonum hydropiperoides* and *Leersia lenticularis* has also been observed in the Oconee National Forest.

### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Herb (field)	Forb	<i>Polygonum hydropiperoides</i> , <i>Polygonum punctatum</i>
Herb (field)	Graminoid	<i>Eleocharis obtusa</i> , <i>Leersia oryzoides</i>

#### Global

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Herb (field)	Forb	<i>Polygonum hydropiperoides</i> , <i>Polygonum punctatum</i>
Herb (field)	Graminoid	<i>Leersia lenticularis</i> , <i>Leersia virginica</i>

### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Eleocharis obtusa*, *Leersia oryzoides*, *Ludwigia palustris*, *Polygonum hydropiperoides*, *Polygonum punctatum*

**Global:** *Leersia lenticularis*, *Leersia virginica*, *Polygonum hydropiperoides*, *Polygonum punctatum*

### OTHER NOTEWORTHY SPECIES

**Chickamauga-Chattanooga National Military Park:**

**Global:**

### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G4? (21-Dec-2000). This association is found in the Coastal Plain and Interior from Tennessee and Alabama to the Carolinas. The full extent of its distribution is not known. This is not a rare community type, but it is threatened by filling of wetlands.

### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

#### Chickamauga-Chattanooga National Military Park Comments:

**Global Comments:** Documented from a beaver pond in the floodplain of Owl Creek, Shiloh National Battlefield, Tennessee, on soils of the Collins silt loam; also from documented on Bailey Island in the ACE Basin (C. Aulbach-Smith pers. comm.). Also seen in the Bankhead National Forest, Alabama, and the Oconee National Forest, Georgia.

**Global Similar Associations:**

**Global Related Concepts:**

**OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This association is only known from Chickamauga Battlefield in one small example of a depression pond.

**Global Range:** This association is found in the Coastal Plain, Ridge and Valley, and other interior provinces from Tennessee and Alabama to the Carolinas. The full extent of its distribution is not known.

**Nations:** US

**States/Provinces:** AL, GA, KY?, NC, NJ, PA, SC, TN

**USFS Ecoregions:** 221Ea:CCC, 221Ha:CCC, 221Hc:CCC, 221Hd:CC?, 221He:CCC, 222Ce:CCP, 222Cf:CCP, 222Cg:CCC, 222Eb:CCC, 222Eg:CCP, 222Ej:CCC, 222En:CCC, 222Eo:CCC, 231Aa:CCC, 231Ae:CCP, 231Af:CCP, 231Ao:CCC, 231Bc:CC?, 231Bd:CC?, 231Be:CC?, 231Cc:CCC, 231Cd:CCC, 232Bl:CCC, M221Cd:CCC

**Federal Lands:** DOD (Fort Benning); NPS (Chickamauga-Chattanooga, Friendship Hill, Great Smoky Mountains, Morristown, Shiloh); USFS (Bankhead, Daniel Boone?, Oconee, Talladega (Oakmulgee)?, Talladega (Talladega)?, Talladega?)

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.03 (in part).

**Local Description Authors:** T. Govus

**Global Description Authors:** M. Andreu and M. Tukman

**References:** Aulbach-Smith pers. comm., Ehrenfeld 1977, Gallyoun et al. 1996, NatureServe Ecology - Southeastern U.S. unpubl. data, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

**Southern Ridge and Valley Annual Grass Glade**

*Sporobolus vaginiflorus* (var. *ozarkanus*, var. *vaginiflorus*) - *Hypericum dolabriforme* Herbaceous Vegetation

(Ozark Dropseed, Poverty Dropseed) - Stragglng St. John's-wort Herbaceous Vegetation

Identifier: CEGL004339

**NVC Classification**

Physiognomic Class	Herbaceous Vegetation (V)
Physiognomic Subclass	Annual graminoid or forb vegetation (V.D.)
Physiognomic Group	Temperate or subpolar annual grasslands or forb vegetation (V.D.2.)
Physiognomic Subgroup (V.D.2.N.)	Natural/Semi-natural temperate or subpolar annual grasslands or forb vegetation
Formation	Short temperate annual grassland (V.D.2.N.d.)
Alliance	<i>Sporobolus</i> ( <i>neglectus</i> , <i>vaginiflorus</i> ) Herbaceous Alliance (A.1815)
Alliance (English name)	(Barrens Dropseed, Poverty Dropseed) Herbaceous Alliance
Association	<i>Sporobolus vaginiflorus</i> (var. <i>ozarkanus</i> , var. <i>vaginiflorus</i> ) - <i>Hypericum dolabriforme</i>
Association (English name)	Herbaceous Vegetation
Vegetation	(Ozark Dropseed, Poverty Dropseed) - Stragglng St. John's-wort Herbaceous
Association (Common name)	Southern Ridge and Valley Annual Grass Glade

**Ecological System(s):** Ridge and Valley Calcareous Valley Bottom Glade and Woodland (CES202.024)

### ELEMENT CONCEPT

**Global Summary:** This association accommodates vegetation dominated by annual *Sporobolus* species for portions of the Cumberland and Southern Ridge and Valley. Stands are dominated by some combination of *Sporobolus neglectus*, *Sporobolus vaginiflorus* var. *vaginiflorus*, and/or *Sporobolus vaginiflorus* var. *ozarkanus* (= *Sporobolus ozarkanus*). These are typically small-patch occurrences within limestone glade complexes and are located on thinner soils when compared to perennial grass-dominated glade vegetation.

### ENVIRONMENTAL DESCRIPTION

#### USFWS Wetland System:

**Chickamauga-Chattanooga National Military Park Environment:** These are typically small-patch occurrences located on thin-soiled areas within the glade complexes. The substrates are dolomites and limestones of the Knox and Chickamauga groups which are rich in both calcium and magnesium. These areas are very wet during periods of winter rainfall and extremely dry during the growing season, especially during the periodic droughts that are known to occur in this region. This environment is best regarded as a microhabitat and results from very subtle environmental conditions related to the amount of bedrock exposed; the angle, pitch and elevation of the rock; exposure to solar radiation, and numerous other edaphic factors that favor annual grass dominance. The elevation of this association at Chickamauga-Chattanooga National Military Park ranges from 225 to 238 m (740-780 feet).

**Global Environment:** At Chickamauga-Chattanooga National Military Park (Georgia), these glades occur on dolomites and limestones of the Chickamauga and Knox groups, in contrast to the Middle Tennessee glades which occur on Lebanon and Ridley limestones of Ordovician age. These areas are very wet during periods of winter rainfall and extremely dry during the growing season, especially during the periodic droughts that are known to occur in this region. Dolomites of the Knox Group are rich in both calcium and magnesium. There are very few documented occurrences of these limestone glade environments, and these sites are often subjected to human influences such as trampling, horseback riding and off-road vehicle use. It is presumed that a number of examples have been destroyed by quarrying.

### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** Stands on the Chickamauga Unit of Chickamauga-Chattanooga National Military Park (Georgia) are dominated by annual *Sporobolus* species (thought to be *Sporobolus vaginiflorus* var. *ozarkanus* (= *Sporobolus ozarkanus*), which is difficult to distinguish from *Sporobolus vaginiflorus* var. *vaginiflorus* and *Sporobolus neglectus*). Some other species which are present include *Asclepias verticillata*, *Croton capitatus*, *Croton monanthogynus*, *Hedyotis nigricans* var. *nigricans*, *Heliotropium tenellum*, *Hypericum dolabriforme*, *Isanthus brachiatus*, *Manfreda virginica*, and *Ruellia humilis*. The endemic or near-endemic *Dalea gattereri* and *Pediomelum subacaule* are also found here. These annual grass-dominated glades are floristically similar to those of the Nashville Basin (Tennessee) and Moulton Valley (Alabama) but are treated separately.

**Global Vegetation:** This association, known only from the Chickamauga Unit of Chickamauga-Chattanooga National Military Park (Georgia), is dominated by annual *Sporobolus* species (thought to be *Sporobolus vaginiflorus* var. *ozarkanus* (= *Sporobolus ozarkanus*), which is difficult to distinguish from *Sporobolus vaginiflorus* var. *vaginiflorus* and *Sporobolus neglectus*). Some other species which are present include *Asclepias verticillata*, *Croton capitatus*, *Croton monanthogynus*, *Hedyotis nigricans* var. *nigricans*, *Heliotropium tenellum*, *Hypericum dolabriforme*, *Isanthus brachiatus*, *Manfreda virginica*, and *Ruellia humilis*. The endemic or near-endemic *Dalea gattereri* and *Pediomelum subacaule* are also found here. These annual grass-dominated glades are floristically similar to those of the Nashville Basin (Tennessee) and Moulton Valley (Alabama) but are treated separately.

### MOST ABUNDANT SPECIES

#### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Herb (field)	Graminoid	<i>Sporobolus vaginiflorus</i>

#### Global

**Stratum****Lifeform****Species****CHARACTERISTIC SPECIES**

**Chickamauga-Chattanooga National Military Park:** *Asclepias verticillata*, *Croton capitatus*, *Croton monanthogynus*, *Heliotropium tenellum*, *Hypericum dolabriforme*, *Manfreda virginica*, *Sporobolus vaginiflorus*, *Trichostema brachiatum*

**Global:**

**OTHER NOTEWORTHY SPECIES**

**Chickamauga-Chattanooga National Military Park:**

**Global:** *Dalea gattingeri*, *Pedimelum subacaule*

**CONSERVATION STATUS RANK**

**Global Rank & Reasons:** G2G3 (22-Oct-2002). Some examples are conserved on the Chickamauga Unit (Georgia) of the Chickamauga-Chattanooga National Military Park. Examples which are not conserved on federal or state lands are highly vulnerable to development pressure, off-road vehicle traffic, and gravel and mineral surface mining.

**CLASSIFICATION**

**Status:** Standard

**Classification Confidence:** 2 - Moderate

**Chickamauga-Chattanooga National Military Park Comments:**

**Global Comments:** This association would be found in the portions of the Cumberland and Southern Ridge and Valley not covered by *Sporobolus (neglectus, vaginiflorus) - Aristida longispica - Panicum flexile - Panicum capillare* Herbaceous Vegetation (CEGL004340). This includes the Chickamauga Unit (Georgia) of the Chickamauga-Chattanooga National Military Park. *Sporobolus neglectus* is not attributed to Georgia (Kartesz 1999). This type formerly included related vegetation of the Ozark region (mistakenly thought to also be needed for the Ouachitas). This geographic portion is now accommodated by an additional placeholder, *Sporobolus vaginiflorus var. ozarkanus* Ozark Herbaceous Vegetation (CEGL008563). Not sure about the status of Virginia as related to this vegetation; it is left here for now. Need to clarify the identity of the annual *Sporobolus* species which are present.

**Global Similar Associations:**

*Sporobolus (neglectus, vaginiflorus) - Aristida longispica - Panicum flexile - Panicum capillare* Herbaceous Vegetation (CEGL004340)--attributed to the Nashville Basin (Tennessee) and the Moulton Valley (Alabama).

**Global Related Concepts:**

Glade Complex (Gallyoun et al. 1996) B

**OTHER COMMENTS**

**Other Comments:**

**ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This association is restricted to the eastern portion of Chickamauga Battlefield.

**Global Range:** This type is found in the Cumberland and Southern Ridge and Valley of Georgia and possibly adjacent Tennessee. Its status in Virginia is unclear.

**Nations:** US

**States/Provinces:** GA, TN?, VA?

**USFS Ecoregions:** 231Da:CCC

**Federal Lands:** NPS (Chickamauga-Chattanooga)

## ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH:20.

**Local Description Authors:** T. Govus

**Global Description Authors:** M. Pyne, mod. T. Govus

**References:** Gallyoun et al. 1996, Kartesz 1999, Rogers et al. 1993, Southeastern Ecology Working Group n.d.

**Interior Low Plateau Limestone Glade Ephemeral Pool**

*Sedum pulchellum* - *Talinum calcaricum* - *Leavenworthia* spp. / *Nostoc commune* Herbaceous Vegetation

Widow's-cross - Limestone Fameflower - Gladecress species / Common Nostoc Herbaceous Vegetation

Identifier: CEGL004346

**NVC Classification**

Physiognomic Class	Herbaceous Vegetation (V)
Physiognomic Subclass	Annual graminoid or forb vegetation (V.D.)
Physiognomic Group	Temperate or subpolar annual grasslands or forb vegetation (V.D.2.)
Physiognomic Subgroup (V.D.2.N.)	Natural/Semi-natural temperate or subpolar annual grasslands or forb vegetation
Formation	Saturated temperate annual forb vegetation (V.D.2.N.i.)
Alliance	<i>Sedum pulchellum</i> Saturated Herbaceous Alliance (A.1820)
Alliance (English name)	Widow's-cross Saturated Herbaceous Alliance
Association	<i>Sedum pulchellum</i> - <i>Talinum calcaricum</i> - <i>Leavenworthia</i> spp. / <i>Nostoc commune</i> Herbaceous Vegetation
Association (English name)	Widow's-cross - Limestone Fameflower - Gladecress species / Common Nostoc Herbaceous
Association (Common name)	Vegetation Interior Low Plateau Limestone Glade Ephemeral Pool
<b>Ecological System(s):</b>	Nashville Basin Limestone Glade and Woodland (CES202.334) Central Interior Highlands Calcareous Glade and Barrens (CES202.691)

## ELEMENT CONCEPT

**Global Summary:** This herbaceous community is a zonal component of Nashville Basin (Tennessee) and Moulton Valley (Alabama) Cedar Glades. This vegetation characteristically occupies depressions in the limestone which hold water in the winter and early spring. These areas become desiccated and baked in the heat of summer. Characteristic plants are the annuals *Sedum pulchellum* and *Leavenworthia* spp., and the perennial *Talinum calcaricum*. The characteristic endemic *Leavenworthia* spp. in Tennessee are *Leavenworthia stylosa*, *Leavenworthia torulosa*, and *Leavenworthia exigua*. The blue-green alga *Nostoc commune* forms mats. Related vegetation is found in Simpson and Warren counties of Kentucky.

## ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:** Palustrine

**Chickamauga-Chattanooga National Military Park Environment:**

**Global Environment:** This herbaceous community is a zonal component of Nashville Basin (Tennessee) and Moulton Valley (Alabama) Cedar Glades. This vegetation characteristically occupies depressions in the limestone which hold water in the winter and early spring. These areas become desiccated and baked in the heat of summer.

## VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:**

**Global Vegetation:** Characteristic plants are the annuals *Sedum pulchellum* and *Leavenworthia* spp., and the perennial *Talinum calcaricum*. The characteristic endemic *Leavenworthia* spp. in Tennessee are *Leavenworthia stylosa*, *Leavenworthia torulosa*, and *Leavenworthia exigua*. The blue-green alga *Nostoc commune* forms mats.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
<u>Global Stratum</u>	<u>Lifeform</u>	<u>Species</u>

#### CHARACTERISTIC SPECIES

##### Chickamauga-Chattanooga National Military Park:

Global:

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

Global: *Leavenworthia crassa*, *Leavenworthia stylosa*, *Talinum calcaricum*

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G3 (15-Dec-1999). This community is restricted to the Inner Nashville Basin subsection of Tennessee, the Moulton Valley of Alabama, and a few limited areas of Kentucky. It may cover large parts of some glade sites and is more stable than some other glade communities. However, its overall coverage of the landscape is limited, and it is threatened by development and land-use conversion in this area of rapidly increasing human population. Threats include destruction or degradation by recreational off-road vehicle traffic, gravel and mineral surface mining, and land-use change related to suburban development. Examples which are not conserved on nature preserves, state forests, national forests, or U.S. Corps of Engineers lands are highly vulnerable to development pressure.

#### CLASSIFICATION

**Status:** Standard

**Classification Confidence:** 2 - Moderate

##### Chickamauga-Chattanooga National Military Park Comments:

Global Comments:

Global Similar Associations:

Global Related Concepts:

#### OTHER COMMENTS

Other Comments:

#### ELEMENT DISTRIBUTION

##### Chickamauga-Chattanooga National Military Park Range:

**Global Range:** This vegetation type is restricted to the Nashville Basin of Tennessee, the Moulton Valley of Alabama, and limited areas of Kentucky.

**Nations:** US

**States/Provinces:** AL, KY, TN

**USFS Ecoregions:** 222Ed:CCC, 231Ce:CCC

**Federal Lands:** DOD (J. Percy Priest); NPS (Chickamauga-Chattanooga?, Stones River); TVA (Columbia); USFS (Bankhead?)

## ELEMENT SOURCES

**Chickamauga-Chattanooga National Military Park Inventory Notes:****Chickamauga-Chattanooga National Military Park Plots:****Local Description Authors:**

**Global Description Authors:** M. Pyne

**References:** Evans 1991, Rollins 1997, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data

**Cumberland Plateau Sandstone Cliff (Dry Type)**

*Asplenium montanum* - *Heuchera parviflora* var. *parviflora* - *Silene rotundifolia* Sparse Vegetation

Mountain Spleenwort - Cave Alumroot - Sandstone Fire-pink Sparse Vegetation

Identifier: CEGL004392

**NVC Classification**

Physiognomic Class	Sparse Vegetation (VII)
Physiognomic Subclass	Consolidated rock sparse vegetation (VII.A.)
Physiognomic Group	Sparsely vegetated cliffs (VII.A.1.)
Physiognomic Subgroup	Natural/Semi-natural sparsely vegetated cliffs (VII.A.1.N.)
Formation	Cliffs with sparse vascular vegetation (VII.A.1.N.a.)
Alliance	<i>Asplenium montanum</i> Sparsely Vegetated Alliance (A.1831)
Alliance (English name)	Mountain Spleenwort Sparsely Vegetated Alliance
Association	<i>Asplenium montanum</i> - <i>Heuchera parviflora</i> var. <i>parviflora</i> - <i>Silene rotundifolia</i>
Sparse	Vegetation
Association (English name)	Mountain Spleenwort - Cave Alumroot - Sandstone Fire-pink Sparse Vegetation
Association (Common name)	Cumberland Plateau Sandstone Cliff (Dry Type)
<b>Ecological System(s):</b>	Central Interior Highlands Dry Acidic Glade and Barrens (CES202.692) Cumberland Acidic Cliff and Rockhouse (CES202.309)

## ELEMENT CONCEPT

**Global Summary:** This community occurs relatively on dry, exposed vertical sandstone cliffs in the Cumberland Plateau of Tennessee, Kentucky, Virginia, Georgia, and Alabama. Vegetation consists of scattered individuals of *Asplenium montanum*, *Silene rotundifolia*, and other species rooted in crevices and erosion pockets. In some parts its range, this community is the primary or sole habitat for rare endemic species, such as *Minuartia cumberlandensis*. The vegetation is generally very sparse, owing to rock characteristics. Occasional well-developed crevices and seepages with more moisture and soil development are the primary locations where most vascular plants occur. *Heuchera parviflora* var. *parviflora*, *Silene rotundifolia*, *Asplenium montanum*, *Asplenium bradleyi*, *Mitchella repens*, *Kalmia latifolia*, and *Decumaria barbara* are primary species present.

## ENVIRONMENTAL DESCRIPTION

**USFWS Wetland System:**

**Chickamauga-Chattanooga National Military Park Environment:** This environment encompasses the exposed vertical cliffs of sandstone that cap Lookout Mountain that have primarily a northwestern or southeastern aspect. Amount of vegetation coverage varies with fragmentation and amount of crevices available to small trees, shrubs and herbaceous species that occur in sites where soils can be deposited. Large sections are nearly devoid of vegetation with the exception of patches of lichen. This is a very extreme environment with great shifts in the daily temperature and moisture regime. For most species this is a xeric, acidic environment, and inhabitants need special

adaptations to cope with long periods without moisture. Elevations for this association at Lookout Mountain vary from about 550 to 600 m (1800-1980 feet).

**Global Environment:** This community occurs on relatively dry, exposed portions of vertical sandstone cliffs in the Cumberland Plateau of Tennessee, Kentucky, Virginia, Georgia, and Alabama. These cliffs tend to be massive, but largely shaded by tall trees rooted at their bases and may be exposed to full sun for a maximum of 30-40% of days. On a given cliff this community may be considered the matrix type that typically develops along the upper 1/3 of the vertical surface and lower if seepage is lacking; it is far more common than related moist cliff communities of the region (A. Schotz pers. comm.). The cliff's geometry (few crevices capable of accumulating soil), chemistry (generally highly acid), and erosion (cementing compounds being dissolved and sand particles eroding) create harsh growing conditions; vascular plants, lichens, and nonvascular plants are all infrequent.

#### VEGETATION DESCRIPTION

**Chickamauga-Chattanooga National Military Park Vegetation:** At Lookout Mountain, this vegetation is very patchy with widely scattered small trees and shrubs and sparse herbaceous cover where crevices provide few sites for rooting. Commonly found species in this environment include *Pinus virginiana*, *Acer rubrum*, *Kalmia latifolia*, *Hypericum hypericoides* ssp. *multicaule* (= *Hypericum stragulum*), *Deschampsia flexuosa*, *Yucca filamentosa*, *Schizachyrium scoparium*, *Dryopteris marginalis*, *Dennstaedtia punctilobula*, *Asplenium montanum*, and *Carex lucorum* var. *austrolucorum*. Herbaceous cover may only reach 2%, with lichen cover sometimes approaching 30% cover.

**Global Vegetation:** The vegetation is generally very sparse, owing to rock characteristics. Occasional well-developed crevices and seepages with more moisture and soil development are the primary locations where most vascular plants occur. *Heuchera parviflora* var. *parviflora*, *Silene rotundifolia*, *Asplenium montanum*, *Asplenium bradleyi*, *Mitchella repens*, *Kalmia latifolia*, *Decumaria barbara* are primary species present (NatureServe Ecology unpubl. data). Locally, seepages may support *Osmunda cinnamomea*, *Woodwardia areolata*, and *Itea virginica*. Because these seepage areas are of very small size, they are included within the concept of this type. *Asplenium montanum* is a characteristic species in stands of this type, although it may not have high cover and will not necessarily even be present. *Heuchera parviflora* and *Silene rotundifolia* are equally characteristic and diagnostic.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Global		
<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>

#### CHARACTERISTIC SPECIES

**Chickamauga-Chattanooga National Military Park:** *Acer rubrum*, *Carex lucorum* var. *austrolucorum*, *Dennstaedtia punctilobula*, *Deschampsia flexuosa*, *Dryopteris marginalis*, *Kalmia latifolia*, *Pinus virginiana*, *Schizachyrium scoparium*, *Yucca filamentosa*

**Global:**

#### OTHER NOTEWORTHY SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:** *Cheilolejeunea evansii*, *Hymenophyllum tayloriae*, *Radula sullivantii*, *Silene rotundifolia*, *Tetradontium brownianum*, *Thalictrum mirabile*, *Thelypteris pilosa* var. *alabamensis*, *Trichomanes intricatum*

#### CONSERVATION STATUS RANK

**Global Rank & Reasons:** G3G4 (2-Feb-2001). This association occurs in a limited area of the Cumberland Plateau of northern Alabama, northwestern Georgia, eastern Kentucky, eastern Tennessee, and southwestern Virginia. Sites are of small extent, being associated with sandstone cliffs. There are few known threats, and the imperilment of this association is presumably relatively stable. There are thousands of miles of potential habitat, and threats are limited; the imperilment of this association is presumably limited, and its status somewhat stable.

**CLASSIFICATION****Status:** Standard**Classification Confidence:** 2 - Moderate**Chickamauga-Chattanooga National Military Park Comments:****Global Comments:** This type can co-occur with C EGL008432 on a given cliff. In general C EGL004392 occurs at the uppermost 1/3 of the cliff exposures, while C EGL008432 occurs at lower, more shaded portions.**Global Similar Associations:**

Appalachian - Alleghenian Sandstone Dry Cliff Sparse Vegetation (C EGL006435)

*Heuchera parviflora* var. *parviflora* - *Trichomanes boschianum* - *Thalictrum mirabile* - (*Ageratina luciae-brauniae*, *Solidago albopilosa*) Herbaceous Vegetation (C EGL004301)--a wetter seepage type.*Osmunda cinnamomea* - *Rhynchospora capitellata* - *Thalictrum mirabile* Cumberland Seepage Cliff Herbaceous Vegetation (C EGL008432)**Global Related Concepts:**

Sandstone Cliffs and Rockhouses (Schmalzer and DeSelm 1982) =

**OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION****Chickamauga-Chattanooga National Military Park Range:** This association is restricted to the upper portion of Lookout Mountain.**Global Range:** This association occurs in a limited area of the Cumberland Plateau of northern Alabama, northwestern Georgia, eastern Kentucky, eastern Tennessee, and possibly southwestern Virginia**Nations:** US**States/Provinces:** AL, GA, KY, TN, VA?**USFS Ecoregions:** 221Hc:CCC, 221He:CCC, 222Eb:CCC, 222En:CCC, 222Eo:CCC, 231Cd:CCC**Federal Lands:** NPS (Big South Fork, Chickamauga-Chattanooga, Obed, Russell Cave); USFS (Bankhead, Daniel Boone)**ELEMENT SOURCES****Chickamauga-Chattanooga National Military Park Inventory Notes:****Chickamauga-Chattanooga National Military Park Plots:****Local Description Authors:** T. Govus**Global Description Authors:** Evans (1991)**References:** Evans 1991, NatureServe Ecology - Southeastern U.S. unpubl. data, Schmalzer and DeSelm 1982, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data**Montane Cliff (Calcareous Type)***Asplenium ruta-muraria* - *Pellaea atropurpurea* Sparse Vegetation

Wall-rue - Purple Cliffbrake Sparse Vegetation

Identifier: C EGL004476

**NVC Classification**

Physiognomic Class

Sparse Vegetation (VII)

Physiognomic Subclass

Consolidated rock sparse vegetation (VII.A.)

Physiognomic Group	Sparsely vegetated cliffs (VII.A.1.)
Physiognomic Subgroup	Natural/Semi-natural sparsely vegetated cliffs (VII.A.1.N.)
Formation	Cliffs with sparse vascular vegetation (VII.A.1.N.a.)
Alliance (A.1832)	<i>Asplenium ruta-muraria</i> - <i>Pellaea atropurpurea</i> Sparsely Vegetated Alliance
Alliance (English name)	Wall-rue - Purple Cliffbrake Sparsely Vegetated Alliance
Association	<i>Asplenium ruta-muraria</i> - <i>Pellaea atropurpurea</i> Sparse Vegetation
Association (English name)	Wall-rue - Purple Cliffbrake Sparse Vegetation
Association (Common name)	Montane Cliff (Calcareous Type)
<b>Ecological System(s):</b>	North-Central Appalachian Circumneutral Cliff and Talus (CES202.603) Southern Interior Calcareous Cliff (CES202.356)

#### ELEMENT CONCEPT

**Global Summary:** This community includes calcareous cliffs associated with limestone or dolomite geology in Alabama, Kentucky, Maryland, North Carolina, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia. This community includes dry to rather moist limestone and dolomite outcrops, usually shaded by trees rooted in adjacent forested communities. It has little vegetative cover, often with 90% of the rock surface unvegetated. Mosses and lichens can have moderate coverage; vascular plants occur on ledges and rooted in cracks. Calciphilic herbs such as *Asplenium ruta-muraria*, *Pellaea atropurpurea*, *Pellaea glabella* ssp. *glabella*, *Asplenium resiliens*, *Aquilegia canadensis* are characteristic. Moister microhabitats of the crevice may have mosses such as *Anomodon rostratus* and *Anomodon attenuatus*.

#### ENVIRONMENTAL DESCRIPTION

##### USFWS Wetland System:

##### Chickamauga-Chattanooga National Military Park Environment:

**Global Environment:** This community occurs on calcareous cliffs, outcrops, and rocky slopes and is often shaded by trees rooted in adjacent forested communities and/or the outcrops. It has little vegetative cover, often with 90% of the rock surface unvegetated. Mosses and lichens can have moderate coverage, and vascular plants occur on ledges and rooted in cracks.

#### VEGETATION DESCRIPTION

##### Chickamauga-Chattanooga National Military Park Vegetation:

**Global Vegetation:** Stands of this association are characterized by sparse herbaceous vegetation, with vascular plants rooted in crevices and on shelves. Calciphilic herbs such as *Aquilegia canadensis*, *Dodecatheon meadia*, *Symphyotrichum ericoides*, *Symphyotrichum oblongifolium*, *Cystopteris bulbifera*, *Bouteloua curtipendula*, *Pellaea atropurpurea*, *Dryopteris marginalis*, *Allium cernuum*, *Heuchera americana*, *Carex oligocarpa*, *Asplenium trichomanes*, *Arabis hirsuta*, *Arabis lyrata*, *Phlox subulata*, *Hylotelephium telephioides* (= *Sedum telephioides*), and *Saxifraga virginiana* are characteristic. Woody species may occur scattered throughout or at the margins; these species include *Juniperus virginiana*, *Rhus aromatica*, *Toxicodendron radicans*, *Hydrangea arborescens*, *Fraxinus americana*, *Parthenocissus quinquefolia*, *Cercis canadensis*, *Tilia americana*, *Carya* spp., *Quercus muehlenbergii*, *Ostrya virginiana*, and *Cornus florida*.

#### MOST ABUNDANT SPECIES

##### Chickamauga-Chattanooga National Military Park

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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<u>Global Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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#### CHARACTERISTIC SPECIES

##### Chickamauga-Chattanooga National Military Park:

**Global:** *Aquilegia canadensis*, *Asplenium resiliens*, *Asplenium ruta-muraria*, *Pellaea atropurpurea*, *Pellaea glabella* ssp. *glabella*

**OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:****Global:****CONSERVATION STATUS RANK****Global Rank & Reasons:** G3G4 (11-Aug-1997).**CLASSIFICATION****Status:** Standard**Classification Confidence:** 2 - Moderate**Chickamauga-Chattanooga National Military Park Comments:****Global Comments:** This community is scattered in the Central Appalachian and Ridge and Valley provinces but is extremely uncommon in the Southern Blue Ridge.**Global Similar Associations:****Global Related Concepts:**

IE1a. Southern Appalachian Calcareous Cliff (Allard 1990) ?

Montane Cliff (Calcareous Subtype) (Schafale 1998b) ?

Spleenwort-cliffbrake calcareous cliff (CAP pers. comm. 1998) ?

**OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION****Chickamauga-Chattanooga National Military Park Range:****Global Range:** This community occurs in areas of limestone or dolomite geology from Pennsylvania south to Alabama. It is found primarily in the Ridge and Valley and Cumberland Plateau, but ranges into scattered areas in the Blue Ridge.**Nations:** US**States/Provinces:** AL, GA?, KY, MD, NC, PA, SC, TN, VA, WV**USFS Ecoregions:** 221Hc:CCC, 221Ja:CCC, 222Eo:CCC, M221Aa:CCC, M221Ac:CCC, M221Bb:CCP, M221Be:CCC, M221Dc:CCC**Federal Lands:** NPS (C&O Canal, Chickamauga-Chattanooga?, Great Smoky Mountains); USFS (Pisgah)**ELEMENT SOURCES****Chickamauga-Chattanooga National Military Park Inventory Notes:****Chickamauga-Chattanooga National Military Park Plots:****Local Description Authors:****Global Description Authors:** E. Largay, mod. G.P. Fleming**References:** Allard 1990, CAP pers. comm. 1998, Fike 1999, Fleming et al. 2001, Harrison 2004, Schafale 1998b, Schafale and Weakley 1990, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data**Appalachian Talus Slope***Parthenocissus quinquefolia* / (*Dicentra eximia*) Sparse Vegetation

Virginia Creeper / (Appalachian Bleeding-heart) Sparse Vegetation

Identifier: CEGL004454

**NVC Classification**

Physiognomic Class	Sparse Vegetation (VII)
Physiognomic Subclass	Boulder, gravel, cobble, or talus sparse vegetation (VII.B.)
Physiognomic Group	Sparsely vegetated talus/scree slopes (VII.B.1.)
Physiognomic Subgroup	Natural/Semi-natural sparsely vegetated talus/scree slopes (VII.B.1.N.)
Formation	Lowland or submontane talus/scree (VII.B.1.N.a.)
Alliance	Lowland Talus Sparsely Vegetated Alliance (A.1847)
Alliance (English name)	Lowland Talus Sparsely Vegetated Alliance
Association	<i>Parthenocissus quinquefolia</i> / ( <i>Dicentra eximia</i> ) Sparse Vegetation
Association (English name)	Virginia Creeper / (Appalachian Bleeding-heart) Sparse Vegetation
Association (Common name)	Appalachian Talus Slope

**Ecological System(s):** North-Central Appalachian Acidic Cliff and Talus (CES202.601)  
Southern Appalachian Montane Cliff and Talus (CES202.330)

**ELEMENT CONCEPT**

**Global Summary:** This sparse vegetation is known from low elevations (below 762 m [2500 feet]) in the Appalachians (e.g., Nantahala Gorge, North Carolina, Lookout Mountain and Neddy Mountain, Tennessee). These talus slopes vary from very sparse to sometimes having substantial cover of *Toxicodendron radicans* and *Parthenocissus quinquefolia*. Scattered herbs sometimes include *Dicentra eximia*, *Dryopteris marginalis*, *Asplenium rhizophyllum*, *Scutellaria ovata*, *Polymnia canadensis*, and *Dioscorea quaternata*.

**ENVIRONMENTAL DESCRIPTION****USFWS Wetland System:**

**Chickamauga-Chattanooga National Military Park Environment:** This association is documented from talus occurring at the base of the cliff section of Lookout Mountain at an elevation of 550 m (1800 feet).

**Global Environment:** This sparse vegetation is known from talus slopes at low elevations (below 762 m [2500 feet]) in the Appalachians (e.g., Nantahala Gorge, North Carolina, Lookout Mountain and Neddy Mountain, Tennessee).

**VEGETATION DESCRIPTION**

**Chickamauga-Chattanooga National Military Park Vegetation:** The example studied is strongly dominated by a mixture of *Parthenocissus quinquefolia*, *Toxicodendron radicans*, and *Vitis aestivalis*. Other notable species found here include *Dryopteris marginalis*, *Asplenium rhizophyllum*, *Scutellaria ovata*, *Eurybia divaricata*, and *Solidago curtisii*.

**Global Vegetation:** Stands of this vegetation vary from very sparse to sometimes with substantial cover of *Toxicodendron radicans* and *Parthenocissus quinquefolia*, and with scattered herbs including *Dicentra eximia*, *Dryopteris marginalis*, *Dioscorea quaternata*. An (apparent) example of this vegetation in the Cherokee National Forest, Tennessee (Neddy Mountain #1) has coverage by *Toxicodendron radicans*, *Parthenocissus quinquefolia*, *Dryopteris marginalis*, *Polymnia canadensis*, *Vitis rotundifolia*, and foliose lichens.

**MOST ABUNDANT SPECIES****Chickamauga-Chattanooga National Military Park**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
Shrub/sapling (tall & short)	Vine/Liana	<i>Parthenocissus quinquefolia</i> , <i>Toxicodendron radicans</i> , <i>Vitis aestivalis</i>

**Global**

<u>Stratum</u>	<u>Lifeform</u>	<u>Species</u>
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**CHARACTERISTIC SPECIES**

**Chickamauga-Chattanooga National Military Park:** *Asplenium rhizophyllum*, *Dryopteris marginalis*, *Parthenocissus quinquefolia*, *Toxicodendron radicans*, *Vitis aestivalis*

**Global:****OTHER NOTEWORTHY SPECIES****Chickamauga-Chattanooga National Military Park:****Global:****CONSERVATION STATUS RANK**

**Global Rank & Reasons:** G2G3Q (14-Dec-1998). This community is of uncertain circumscription. Its global rank is dependent on its circumscription. As defined, it is definitely known to occur in North Carolina, and a stand attributed to this type has been found in Tennessee. It may also be found in other Appalachian states. It is unlikely to be common, since unforested talus slopes are limited in this region.

**CLASSIFICATION**

**Status:** Standard

**Classification Confidence:** 3 - Weak

**Chickamauga-Chattanooga National Military Park Comments:****Global Comments:****Global Similar Associations:****Global Related Concepts:**

Talus Vineland (Schafale 1998b) ?

**OTHER COMMENTS****Other Comments:****ELEMENT DISTRIBUTION**

**Chickamauga-Chattanooga National Military Park Range:** This sparse vegetation is restricted to talus slopes at the base of the cliff section of Lookout Mountain.

**Global Range:** As defined, this type is definitely known to occur in North Carolina, and a stand attributed to this type has been found in Tennessee. It may also be found in other Appalachian states.

**Nations:** US

**States/Provinces:** NC, TN, VA?, WV?

**USFS Ecoregions:** 231Cc:CCC, M221Dd:CCC

**Federal Lands:** NPS (Blue Ridge Parkway?, Chickamauga-Chattanooga); USFS (Cherokee, Nantahala)

**ELEMENT SOURCES**

**Chickamauga-Chattanooga National Military Park Inventory Notes:**

**Chickamauga-Chattanooga National Military Park Plots:** CHCH.30.

**Local Description Authors:** T. Govus

**Global Description Authors:** A.S. Weakley, mod. T. Govus

**References:** Peet et al. unpubl. data 2002, Schafale 1998b, Southeastern Ecology Working Group n.d., TDNH unpubl. Data

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**Appendix III. Photos of selected plots at Chickamauga and Chattanooga  
National Military Park**



Plot 1 Chickamauga and Chattanooga National Military Park: - Highland Rim White Oak - Tuliptree Mesic Lower Slope Forest



Plot 2 Chickamauga and Chattanooga National Military Park: White Oak - Post Oak Subcalcareous Forest



Plot 4 Chickamauga and Chattanooga National Military Park: Cultivated Meadow



Plot 7 Chickamauga and Chattanooga National Military Park: Highland Rim Semi-natural Red-cedar - Oak Forest



Plot 8 Chickamauga and Chattanooga National Military Park: Southeastern Interior Southern Red Oak - Scarlet Oak Forest



Plot 12 Chickamauga and Chattanooga National Military Park: Interior Plateau Chinquapin Oak - Shumard Oak Forest



Plot 14 Chickamauga and Chattanooga National Military Park: Red-cedar Successional Forest



Plot 17 Chickamauga and Chattanooga National Military Park: Interior Plateau Chinquapin Oak - Shumard Oak Forest



Plot 18 Chickamauga and Chattanooga National Military Park: Rich Low-Elevation Appalachian Oak Forest



Plot 20 Chickamauga and Chattanooga National Military Park: Southern Ridge and Valley Annual Grass Glade



Plot 21 Chickamauga and Chattanooga National Military Park: Central Limestone Glade



Plot 22 Chickamauga and Chattanooga National Military Park: Southern Blue Ridge Escarpment Shortleaf Pine - Oak Forest



Plot 37 Chickamauga and Chattanooga National Military Park: Cumberland Plateau Dry-Mesic White Oak Forest



Plot 41 Chickamauga and Chattanooga National Military Park: Cumberland Plateau Sandstone Cliff (Dry Type)



Plot 46 Chickamauga and Chattanooga National Military Park: Sycamore - Silver Maple Calcareous Floodplain Forest



Plot 52 Chickamauga and Chattanooga National Military Park: Cumberland Plateau Willow Oak Pond

**Appendix IV. Key to plant associations at Chickamauga and Chattanooga  
National Military Park.**

**Key to the National Vegetation Classification (NVC) Associations, which occur or potentially occur at Chickamauga and Chattanooga National Military Park**

Associations, which are documented from the National Battlefield are in **bold type**. Those, which are potential, but undocumented, are in normal type.

**KEY TO KEYS**

1. Vegetation dominated by trees, either closed forests or open woodlands ..... **2**
1. Vegetation not dominated by trees, trees are absent or very sparse..... **5**
2. Forest, dominated by trees, which provide >60% cover..... **3**
2. Vegetation of sparse forest; open woodlands in which trees cover is <60% ..... **KEY D – WOODLANDS**
3. Cultivated or heavily human influenced, successional forests with evident canopy disturbance or a dominance by successional species like loblolly pine (*Pinus taeda*) or sweetgum (*Liquidambar styraciflua*)  
..... **KEY A – SUCCESSIONAL FORESTS**
3. Natural forests or semi-natural forests ..... **4**
4. Upland forests, rarely if ever flooded ..... **KEY B – UPLAND FORESTS**
4. Forests occurring on floodplains and bottomlands, usually inundated during a part of the growing season, at least temporarily ..... **KEY C – ALLUVIAL AND WETLAND FORESTS**
5. Shrublands, deciduous or evergreen (includes cane and bamboo shrublands up to 10 m or 33' tall and vine dominated areas (with few or no trees) ..... **KEY E - SHRUBLANDS**
5. Vegetation dominated by herbaceous plants..... **6**
6. Vegetation dominated or characterized by grasses, forbs or grass-like plants (perennial or annual), includes glades and pastures ..... **KEY F – HERBACEOUS AND GRAMINOID VEGETATION**
6. Sparse mixed vegetation associated with cliffs and rock outcrops, herb cover less than %10  
..... **KEY G – SPARSE VEGETATION**

**KEY A – SUCCESSIONAL FORESTS**

1. Cultivated or planted forests ..... **2**
1. Successional or strongly human influenced disturbed forests ..... **3**
2. Planted white pine (*Pinus strobus*) forest ..... **White Pine Plantation (CEGL007178)**
2. Planted Virginia pine (*Pinus virginiana*) forest ..... **Virginia Pine Plantation (CEGL004730)**

3. Evergreen or mixed evergreen - hardwood dominated successional forests .....	4
3. Deciduous hardwood dominated successional forests .....	6
4. Forest dominated or co-dominated by loblolly pine ( <i>Pinus taeda</i> ).....	5
4. Forest dominated by Eastern red-cedar ( <i>Juniperus virginiana</i> ).....	
..... <b>Red-cedar Successional Forest (CEGL007124)</b>	
5. Forest canopy strongly dominated by loblolly pine and sometimes sweetgum ( <i>Liquidambar styraciflua</i> ), often found on bottomlands or low lying areas .....	
..... <b>Mid- to Late-Successional Loblolly Pine - Sweetgum Forest (CEGL008462)</b>	
5. Forest canopy dominated by a mixture of loblolly pine, tulip poplar ( <i>Liriodendron tulipifera</i> ) and sugar maple ( <i>Acer saccharum barbatum</i> ), usually in upland situations.....	
..... <b>Interior Mid- to Late-Successional Loblolly Forest (CEGL007105)</b>	
6. Forest dominated by tulip poplar ( <i>Liriodendron tulipifera</i> ) .....	7
6. Forest dominated by deciduous trees other than tulip poplar .....	8
7. Bottomland forest dominated by tulip poplar and box-elder ( <i>Acer negundo</i> ) .....	
..... <b>Successional Tuliptree Bottomland Forest (CEGL007184)</b>	
7. Upland forest with a large mix of successional species which are usually indicative of basic soils [i.e. red bud ( <i>Cercis canadensis</i> ), slippery elm ( <i>Ulmus rubra</i> ), hackberry ( <i>Celtis</i> sp), spicebush ( <i>Lindera benzoin</i> )] .....	
..... <b>Successional Tuliptree Forest (Circumneutral Type) (CEGL007220)</b>	
8. Small patch forest dominated almost exclusively by black walnut ( <i>Juglans nigra</i> ) usually found in vicinity of old home sites .....	
..... <b>Successional Black Walnut Forest (CEGL007879)</b>	
8. Forest largely dominated or co-dominated by sweetgum .....	9
9. Young stand dominated largely by sweetgum to the exclusion of other species.....	
..... <b>Successional Sweetgum Forest (CEGL007216)</b>	
9. Older stand that has recovered and may include oaks or other hardwoods within the canopy.....	
..... <b>Interior Mid – Late Successional Sweetgum - Oak Forest (CEGL007217)</b>	

## KEY B – UPLAND FORESTS

1. Forests dominated by a mixture of species including white oak ( <i>Quercus alba</i> ) as a dominant .....	2
1. Forest dominated by other tree species .....	6
2. Mesic white oak forests found on lower slopes, usually with deep soils .....	3
2. Drier white oak forests, usually on well drained upper and exposed slopes .....	4

3. Slope forest with a mixed canopy including hickories and rich site species like sugar maple (*Acer saccharum* or *A. barbatum*) as well as a moderately rich herb layer of cove type herbs [i.e. black snakeroot (*Cimicifuga racemosa*), trillium and mayapple (*Podophyllum peltatum*)] .....  
 ..... **Rich Low-Elevation Appalachian Oak Forest (CEGL007233)**
3. Small stream bottomland white oak forest sometimes with tulip poplar, or more frequently sweet gum, and a generally poorly developed herb layer of acidic species particularly Christmas fern (*Polystichum acrostichoides*) .....  
 ..... **South-Central Interior White Oak - Tuliptree Mesic Lower Slope Forest (CEGL007709)**
4. Canopy with a mixture of white oak and chestnut oak (*Quercus prinus*) .....  
 ..... **Cumberland Plateau Dry-Mesic White Oak Forest (CEGL008430)**
4. Canopy not co-dominated by white and chestnut oak (3 choices) ..... **5**
5. Canopy including a significant amount of northern red oak (*Quercus rubra*) .....  
 ..... **Ridge-and-Valley Dry-Mesic White Oak - Hickory Forest (CEGL007240)**
5. Canopy including a co-dominance of white oak and post oak (*Quercus stellata*) .....  
 ..... **White Oak - Post Oak Subcalcareous Forest (CEGL008443)**
5. Canopy including white oak and black oak and often on sandstone derived soils (sandy loams) .....  
 ..... **Cumberland Plateau Dry-Mesic White Oak Forest (CEGL007231)**
6. Canopy with a substantial component of chinquapin oak (*Quercus muehlenbergii*) and typically restricted to limestone substrates, often associated with glade complexes (3 choices) ..... **7**
6. Canopy lacking a significant component of chinquapin oak (<25%) and usually occurring on different substrates ..... **8**
7. Canopy with a conspicuous mix of sugar maple and chinquapin oak, lacking an abundance of dry oak species (i.e. *Quercus falcata*, *Q. stellata*) .....  
 ..... **Appalachian Sugar Maple - Chinquapin Oak Limestone Forest (CEGL006017)**
7. Drier forests including dry oak species such as *Quercus falcata* and *Quercus stellata* .....  
 ..... **Interior Low Plateau Chinquapin Oak - Mixed Oak Forest (CEGL007699)**
7. More mesic to dry-mesic forests including Shumard oak (*Quercus shumardii*) and shagbark hickories (*Carya carolinae-septentrionalis* – *C. ovata*) .....  
 ..... **Interior Plateau Chinquapin Oak - Shumard Oak Forest (CEGL007808)**
8. Canopy dominated by sweetgum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*) and oak species, especially white oak .....  
 ..... **Interior Mid- to Late-Successional Sweetgum - Oak Forest (CEGL007217)**
8. Canopy dominated by species other than sweetgum (3 choices) ..... **9**
9. Forest occurring on mesic lower slopes near streams and with a canopy including substantial amount of American beech (*Fagus grandifolia*) ..... **Central Interior Beech - White Oak Forest (CEGL007881)**
9. Forest dominated by chestnut oak and other deciduous canopy species ..... **10**

- 9. Forests dominated by a mixture of other oak species, either post oak (*Quercus stellata*), southern red oak (*Quercus falcata*); or oaks and evergreen species, either pines or Eastern red-cedar ..... **11**
- 10. Less frequent and more xeric chestnut oak forest on ridgetops/upper slopes and usually including scarlet oak (*Quercus coccinea*) and sand hickory (*Carya pallida*) in canopy .....  
..... **Xeric Ridgetop Chestnut Oak Forest (CEGL008431)**
- 10. Widespread and slightly more mesic chestnut oak forest of mid and lower slopes, lacking xeric canopy species and sometimes including more mesic species like northern red oak and white oak.....  
..... **Interior Low Plateau Chestnut Oak - Mixed Oak Forest (CEGL007700)**
- 11. Canopy of Eastern red cedar and mixed oak species, late successional and usually in areas that were pastured or cleared in historic times with canopy and/or subcanopy containing a large component of Eastern Red cedar.....**Highland Rim Semi-natural Red-cedar - Oak Forest (CEGL004731)**
- 11. Eastern red cedar may be present but not dominating canopy and not an important subcanopy component or may be absent from the canopy.....**12**
- 12. Canopy usually dominated by a mix of post oak (*Quercus stellata*) and southern red oak (*Quercus falcata*), sometimes with a substantial pine component or occasionally with white oak (*Quercus alba*) as a minor component, usually occurring over limestone in rolling terrain.....  
..... **Southeastern Interior Southern Red Oak - Post Oak Forest (CEGL007247)**
- 12. Canopy dominated by shortleaf pine and dry oak species (*Quercus prinus*, *Q. coccinea*, *Q. falcata*), usually occurring on xeric west facing ridges over sandstone.....  
..... **Southern Blue Ridge Escarpment Shortleaf Pine - Oak Forest (CEGL007493)**

**KEY C – ALLUVIAL AND WETLAND FORESTS**

- 1. Forests associated with riverine environments or large order streams (including Lookout Creek).....**2**
- 1. Forests associated with isolated wetlands such as depressions, or associated with beaver impoundments .....**4**
- 2. Forests dominated largely by box-elder (*Acer negundo*) or sweetgum (*Liquidambar styraciflua*) and typically associated with successional habitats..... **3**
- 2. Forests dominated by a variety of other species such as sycamore (*Platanus occidentalis* ) or Shumard oak (*Quercus shumardii*) usually natural or semi-natural and not obviously successional ..... **6**
- 3. Forests dominated largely by box-elder ..... **Box-elder Floodplain Forest (CEGL005033)**
- 3. Forests dominated largely by sweetgum ..... **5**
- 4. Forest dominated by black willow (*Salix nigra*), usually associated with beaver impoundments, wetland depressions or river and stream margins ..... **Black Willow Riparian Forest (CEGL002103)**
- 4. Isolated upland wetland depressions usually associated with the sinking of the geologic substrate (sinkholes), canopy dominated by willow oak or including some willow oak or (*Quercus phellos*).....

- ..... **Cumberland Plateau Willow Oak Pond (CEGL008441)**
- 5. Young successional forest, monospecific and with little natural integrity .....  
..... **Successional Sweetgum Floodplain Forest (CEGL007330)**
- 5. Mature forest with more diverse canopy and more natural integrity, usually a fairly diverse herbaceous layer .....  
..... **Piedmont Small Stream Sweetgum Forest (CEGL004418)**
- 6. Forests dominated or co-dominated by Shumard oak .....  
..... **Southern Interior Oak Bottomland Forest (CEGL008487)**
- 6. Forest not dominated by Shumard oak, usually including sycamore as an important component ..... 7
- 7. Forests occurring on larger streams with a diverse canopy including sycamore, silver maple (*Acer saccharinum*), green ash (*Fraxinus pennsylvanica*), slippery elm (*Ulmus rubra*) and rich herbaceous layer, usually associated with larger streams and rivers (known only from Lookout Creek and Moccasin Bend) .....  
..... **Sycamore - Silver Maple Calcareous Floodplain Forest (CEGL007334)**
- 7. Forests occurring on small streams and poorly drained low areas, lacking silver maple and usually with abundant hackberry (*Celtis laevigata*), herbaceous layer less diverse .....  
..... **Rich Levee Mixed Hardwood Bottomland Forest (CEGL008429)**

**KEY D - WOODLANDS**

- 1. Woodland dominated principally by a mixture of Eastern red-cedar and post oak (*Quercus stellata*) .....  
..... **Cumberland Escarpment Dry Limestone Oak Forest (CEGL004583)**
- 1. Woodland occurring as a part of the limestone glade matrix with scattered small chinquapin oak (*Quercus muehlenbergii*), Eastern red-cedar, Shumard oak (*Quercus shumardii*) and white ash (*Fraxinus americana*) .....  
..... **Central Limestone Glade (CEGL005131)**

**KEY E – SHRUBLANDS**

- 1. Evergreen or semi-evergreen dominated shrublands ..... 2
- 1 Deciduous shrublands ..... 7
- 2. Vegetation dominated by river cane or bamboo ..... 3
- 2. Vegetation not dominated by cane or bamboo, evergreen or mixed shrublands ..... 4
- 3. Vegetation dominated by non-native Golden bamboo (*Phyllostachys aurea*) up to 10m or 33’ tall  
..... **Golden Bamboo Shrubland (CEGL008560)**
- 3. Vegetation dominated by native Giant river cane (*Arundinaria gigantea*)

.....*Floodplain Canebrake* (CEGL003836)

4. Vegetation dominated by Chinese privet (*Ligustrum sinense*) or Common privet (*Ligustrum vulgare*) ..... 5

4. Vegetation not dominated by Chinese privet (*Ligustrum sinense*) or Common privet (*Ligustrum vulgare*) ..... 6

5. Wetlands or bottomlands .....*Chinese Privet Temporarily Flooded Shrubland* (CEGL003837)

5. Uplands, not generally subject to flooding ..... *Chinese Privet Upland Shrubland* (CEGL003807)

6. Vegetation dominated by Eastern red-cedar (*Juniperus virginiana*), fragrant sumac (*Rhus aromatica*), and/or buckthorn bumelia (*Sideroxylon lycioides*) in some combination .....  
.....*Central Basin Limestone Glade Margin Shrubland* (CEGL003938)

6. Vegetation dominated by Southern blackberry (*Rubus argutus*), Southern dewberry (*Rubus trivialis*) and greenbrier (*Smilax* spp.) .....  
..... *Blackberry - Greenbrier Successional Shrubland Thicket* (CEGL004732)

7. Temporarily flooded deciduous shrublands (occur in floodplain areas near rivers or creeks) ..... 8

7. Upland deciduous shrublands (generally not subject to flooding), includes vine areas..... 9

8. Shrubland dominated by shrub sized black willow (*Salix nigra*), near river or stream .....  
.....*Black Willow Riverbank Shrubland* (CEGL003901)

8. Shrubland dominated by Smooth alder (*Alnus serrulata*), near a river or stream  
..... *Interior Alder Shrubland* (CEGL003894)

9. Vegetation dominated by kudzu (*Pueraria montana* var. *lobata*), with few or no trees .....  
.....*Kudzu Vineland* (CEGL003882)

9. Vegetation dominated by blackberries/dewberries (*Rubus argutus*, *Rubus trivialis*) and Greenbrier species (*Smilax glauca*, *Smilax rotundifolia*). May have a variety of tree saplings, other shrubs, herbs, and grasses. Successional, generally occurs following canopy removal .....  
.....*Blackberry – Greenbrier Successional Shrubland Thicket* (CEGL004732)

**KEY F – HERBACEOUS AND GRAMINOID VEGETATION**

1. Communities associated with limestone glades or natural wetland areas and consisting of native species, some of them rare in the general landscape..... 2

1. Graminoid vegetation made up largely of cultivated, very common non-native species ..... 6

2. Vegetation associated with wetland depressions, ponds or beaver impoundments ..... 3

2. Vegetation associated with limestone glades..... 4

3. Wetland depressions or ponds dominated by American burr-weed (*Sparganium americanum*).....  
 .....**Piedmont/Mountain Semipermanent Impoundment (Montane Boggy Type)(CEGL004510)**
3. Wetland areas dominated by smartweed (*Polygonum* sp) and cutgrass (*Leersia* sp.) usually in ponds or  
 beaver impoundments ..... **Smartweed - Cutgrass Beaver Pond (CEGL004290)**
4. Open, generally flat limestone glade with annual grass much of which is Annual dropseed (*Sporobolus*  
*vaginiflorus*) only a few inches high (<10 cm) in the thin soil areas, but forbs and taller annual grasses can  
 be in areas with thicker soil. .... **Southern Ridge and Valley Annual Grass Glade (CEGL004339)**
4. Vegetation not with the above combination of characteristics ..... **5**
5. Mosaic of open woodland with large patches of perennial graminoid vegetation dominated largely by  
 little bluestem (*Schizachyrium scoparium*) and glade species such as purpleletassles (*Dalea gattingeri*),  
 straggling St. John's-wort (*Hypericum dolabriforme*), Nashville breadroot (*Pediomelum subacaule*) and  
 least gladeless (*Leavenworthia exigua* variety *exigua*)..... **Central Limestone Glade (CEGL005131)**
5. Small patch seepage herbaceous vegetation within glade complex dominated by flat spikerush  
 (*Eleocharis compressa*) and Crawe's sedge (*Carex crawei*) ..... **Limestone Seep Glade (CEGL004169)**
6. Grassland pastures and hayfields, more-or-less cultural, but may no longer be actively maintained,  
 dominated by European tall fescue or Meadow fescue (*Lolium arundinaceum, pratense*)  
 ..... **Cultivated Meadow (CEGL004048)**
6. Grass lawns or frequently mowed areas with perennial grasses and forbs (weedy lawns) ..... **Lawns**

## KEY G – SPARSE VEGETATION

1. Vegetation occurring on exposed sandstone cliffs and consisting of small patches of sedges, grasses  
 (*Deschampsia flexuosa*), dwarfed trees, lichens and mosses.....  
 ..... **Cumberland Plateau Sandstone Cliff (Dry Type) (CEGL004392)**
1. Vegetation occurring on talus slopes at the base of sandstone cliffs, largely dominated by Virginia  
 creeper and poison ivy ..... **Appalachian Talus Slope (CEGL004454)**