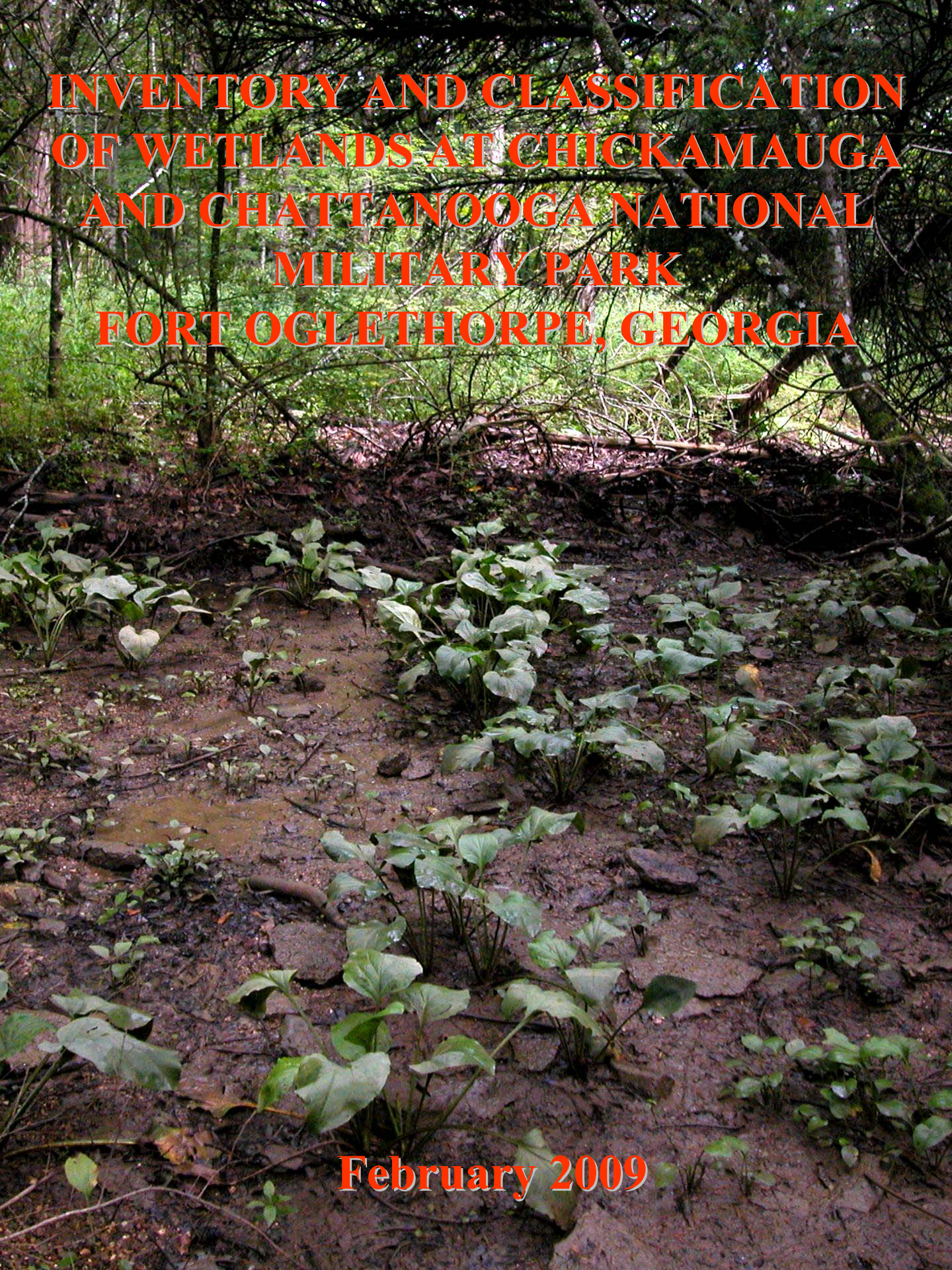


INVENTORY AND CLASSIFICATION OF WETLANDS AT CHICKAMAUGA AND CHATTANOOGA NATIONAL MILITARY PARK FORT OGLETHORPE, GEORGIA

February 2009

INVENTORY AND CLASSIFICATION OF WETLANDS AT CHICKAMAUGA AND CHATTANOOGA NATIONAL MILITARY PARK FORT OGLETHORPE, GEORGIA

A Report Submitted to the National Park Service

By

Thomas H. Roberts and Kenneth L. Morgan

Center for the Management, Utilization, and Protection of Water Resources

Tennessee Technological University

Cookeville, Tennessee

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EXECUTIVE SUMMARY

During 2005 - 2007, an inventory was conducted to collect baseline information on wetlands at Chickamauga and Chattanooga National Military Park (CHCH). The inventory was conducted by establishing a series of baselines along which transects were established and walked. These baselines and transects were established and traversed until the entire park had been systematically searched and all jurisdictional wetlands identified.

A preliminary investigation based on National Wetland Inventory (NWI) maps indicated that approximately eighteen wetlands were present at CHCH. Methods used to identify additional wetlands at the CHCH followed the definition and procedures outlined in the U.S. Army Corps of Engineers, Wetland Delineation Manual (WDM) (1987). When a wetland was located, data were collected that characterized hydrology, soils, and dominant plant species, location, wetland type, and estimated size. The functions and potential values of the wetland also were recorded. Potential functions included surface water storage, groundwater discharge to streams, carbon/nutrient export, provision of wildlife habitat, and support of wetland plants. Potential values included cultural importance, research and scientific value, and economic value. Additionally, observations regarding the presence of exotic plant species and alterations or degradations to the wetland and the potential for restoration were recorded.

Upon completion of the field investigation, one hundred and seventy-nine wetlands had been located and characterized. These wetlands totaled an estimated two hundred and seventy-nine acres.

Based on the Hydrogeomorphic (HGM) classification system, sixty-eight were slope wetlands, fifty-eight were depressions, twenty-nine of the sites were riverine wetlands, and twenty-four were considered flats wetlands.

Based on the Cowardin classification system, one hundred thirty-six of the wetlands were palustrine, forested wetlands dominated by deciduous trees (PFO1). Of these, ninety-two were temporarily flooded (PFO1A), thirty-nine were seasonally flooded (PFO1C), and five were seasonally flooded/saturated (PFO1E). Palustrine scrub-shrub wetlands (PSS) accounted for four wetlands at CHCH. Three of these were seasonally flooded (PSS1C), while one was temporarily flooded/saturated (PSS1E). Twenty-two palustrine emergent wetlands (PEM) having persistent vegetation were present. Eleven were temporarily flooded (PEM1A), nine were seasonally flooded (PEM1C), one was seasonally flooded/saturated (PEM1E), and one was semi-permanently flooded (PEM1F). The remaining sixteen wetlands were considered riverine wetlands within mostly intermittent streams having a streambed of various types (R4SB).

One wetland of particular interest is the slope wetland complex associated with the southwestern corner of the park. It is approximately one hundred and fifty-seven acres in size and likely supports a variety of species and habitat types. Including this area, the average size of wetlands in the park is an estimated 1.56 acres. Excluding this area, the average wetland size is approximately 0.69 acres.

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INTRODUCTION

Chickamauga and Chattanooga National Military Park is approximately 9,000 acres in size and is comprised of Chickamauga Battlefield, Lookout Mountain, Moccasin Bend, and Missionary Ridge; with several historic reservations scattered across the Chattanooga and Lookout Mountain area. These areas are quite different with regards to habitat and vegetation and range topographically from the relatively flat lands of Chickamauga Battlefield and Moccasin Bend to the steep sides of Lookout Mountain and much of Missionary Ridge.

With a general goal of improving the stewardship of wetlands at CHCH, it was determined that the information most needed to initiate proper management of wetland resources at these sites included the location and types of wetlands present and an assessment of functions performed by them. Such knowledge is necessary to facilitate the evaluation of future potential impacts to wetlands. Further, if unavoidable impacts do occur, this information would be useful in the determination of appropriate compensation as required by the U. S. Army Corps of Engineers under Section 404 of the Clean Water Act (CWA), State requirements under Section 401 of the CWA, and requirements by the NPS for compliance with Directors Order #77-1.

Wetlands are defined as "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." (U. S. Army Corps of Engineers 1987). Wetlands are characterized by the presence of "hydric" soils and are dominated by "hydrophytes" that have adaptations that enable them to persist where "upland" plants cannot. A prolonged hydrologic regime (i.e., one in which the site is flooded, ponded, or

saturated for approximately two or more consecutive weeks during the growing season) is the primary factor that controls the establishment and maintenance of wetland characteristics.

This water logging is responsible for the fundamental difference between wetland and non-wetland areas. Specifically, the upper portion of the soil profile in wetlands becomes anoxic because microorganisms consume the available oxygen that is not replenished because of the slow rate of diffusion from the atmosphere into and through a saturated medium. This anoxic environment supports unique microbial populations that have the ability to use elements other than oxygen as terminal electron acceptors in their metabolic processes. These anaerobic microbes are responsible for mediating the biochemical reactions in wetlands (e.g., denitrification) that typically do not take place in environments in which oxygen is present. From a practical perspective, these reactions also result in changes in soil color (generally from brown to gray) due to the conversion of oxidized ferric iron to reduced ferrous iron. The presence of this distinctive color can be used in combination with an examination of the plant community and indicators of hydrology to identify wetlands and delineate the extent of their boundaries. Examination of these three factors (hydrology, soils, and vegetation) has become accepted as the basis for the process of wetland delineation as outlined in the Wetland Delineation Manual (WDM) (U. S. Army Corps of Engineers 1987).

Wetlands include a variety of landforms including marshes, swamps, bogs, fens, vernal pools, pocosins, potholes, playas, wet meadows and others that are described in varying detail in Mitch and Gosselink (2000). These diverse types occur in different landscape positions and may have quite different hydrologic regimes. For example, wetlands commonly are found in lower landscape positions such as lake fringes and river bottoms, but also may occur on hillsides or even on topographic highs such as watershed divides. Similarly, wetlands vary

from those in which surface flooding or ponding occurs regularly to those in which surface water seldom is present. Examples of those in the former category include inland and coastal marshes, and river bottom swamps that are commonly referred to as bottomland hardwoods. These types account for the majority of wetlands in the Southeast. In the latter category are wetlands such as wet meadows and seeps or "springs" where groundwater discharges to the surface. Groundwater discharge wetlands have highly variable hydroperiods with some containing water throughout the year while others are wet only following periods of significant rainfall.

In spite of the many functions that wetlands perform and the often-significant value derived from those functions, approximately 53% of the wetlands originally present in the lower 48 states have been lost since European settlement as a direct result of human activities (Dahl 1990); and in many states, those losses are continuing (Hefner et al. 1994). Dahl (2000) reported that from 1986 to 1997, the wetland types in which the greatest losses occurred were freshwater forested wetlands and freshwater marshes. Estimated losses in each category were 1.2 million acres.

Though wetland loss continues today, our understanding of the importance of wetlands has changed considerably since the mid-1800s through the 1900s when landowners were encouraged to drain, ditch, and fill wetlands (Mitsch and Gosselink 2000). State and Federal regulations have since been instituted to reduce wetland loss, and many entities at all levels of government have adopted programs to aid in wetland conservation and stewardship. The U. S. National Park Service, (NPS) which manages millions of acres in the United States, has begun an initiative to determine the extent and quality of natural resources (including wetlands) under its jurisdiction, including those at CHCH, and is the basis for this study.

WETLAND CLASSIFICATION SYSTEMS/FUNCTIONS

Because of the many inherent differences among wetland types, several classification systems have been developed over the years to place wetlands into meaningful groups for inventory, management, and other purposes. Two of the most useful are the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979) and *A Hydrogeomorphic Classification for Wetlands* (HGM) (Brinson 1993). The former, normally referred to as the Cowardin system, was developed as the basis for the National Wetland Inventory (NWI) conducted by the U. S. Fish and Wildlife Service. It assigns wetlands to 1 of 5 systems and then to a varying number of subsystems and classes based on hydrologic regime, water chemistry, plant community, and other characteristics. The notation or codes for these various attributes are recorded on the NWI maps so users have information not only regarding the presence of wetlands, but what the characteristics of those wetlands are. The Cowardin system has proved very useful for the NWI, but sometimes does not take into account even major differences in landscape position, the source of hydrology for the wetland, or its hydrodynamics; all factors that influence the functions wetlands perform. Thus, its use in classifying wetlands into groups that function similarly is limited. As a result, the HGM classification system that is based on those three factors (landscape setting, source of hydrology, and hydrodynamics) was developed for that specific purpose. In the HGM classification system, wetlands are assigned to 1 of 7 classes: riverine, depression, slope, tidal fringe, lacustrine fringe, mineral soil flats, and organic soils flats. Further subdivisions into subclasses are based on hydrology source and hydrodynamics. A desirable feature of the HGM classification system is that inferences regarding function can be made from the classification system alone. For example, wetlands in the depression class usually will store surface water whereas those in the slope class typically

will not. Export of carbon and nutrients typically will occur in riverine wetlands, but typically will not occur in either of the flats classes. Thus, simply by assigning a wetland to the appropriate HGM class or subclass, much is known about the wetland's role in the landscape.

In addition to those functions mentioned above, wetlands also may cycle nutrients, trap sediments and pollutants, and in some cases, recharge groundwater and provide base flow to streams and rivers. Almost all wetlands provide habitat for a wide variety of flora and fauna and are critical in maintaining local and regional biodiversity. Sather and Smith (1984), Marble (1990), Mitsch and Gosselink (2000), and various HGM documents and guidebooks (e.g., Smith et al. 1995, Ainslie et al. 1999, Smith and Klimas 2002, Wilder and Roberts 2003) all provide excellent summaries of functions that wetlands perform and the values derived from them. During the past decade, consideration of wetland functions has become a routine part of the wetland regulatory process, and it is now common for functions to serve as the basis for decision making regarding issuance of permits and development of mitigation alternatives.

The HGM approach also has been used as the basis for the development of assessment "models" that identify functions performed by a specific wetland class and subclass and can be used to determine the degree to which those functions are performed. The output usually is on a 0 - 1.0 scale in which a score of 1.0 indicates the wetland performs the function to the highest degree, while a score of 0 indicates that the function is not performed at all. Such rigorous assessments may be needed to calculate potential impacts due to a proposed project or to assist in the development of mitigation alternatives. Less detailed assessments where potential wetland function is ranked as high, medium, or low often are appropriate for inventory and baseline determination projects. The HGM approach has been recognized as one of the most useful tools for assessing wetland function by the major federal agencies with regulatory authority or

oversight over wetlands; these include the U. S. Fish and Wildlife Service (FWS), U. S. Environmental Protection Agency (EPA), U. S. Army Corps of Engineers (COE), and the U. S. Natural Resources Conservation Service (NRCS).

OBJECTIVES

The primary objectives of this inventory and assessment included: (1) identify and delineate all wetlands subject to jurisdiction under Sections 404 and 401 of the CWA, and all wetlands subject to National Park Service procedures for implementing Director's order #77-1, (2) produce a database that includes the location and description of all wetlands present including their Cowardin and HGM classifications, and (3) assess the biotic and abiotic functions and values of these wetlands.

METHODS

Prior to conducting the field investigation at CHCH, data that might provide information regarding wetlands there were examined. The principal data were the NWI maps for the area. In spite of their usefulness for inventory studies, NWI maps have limitations. For example, the NWI is more accurate in open landscapes in which wetland "signatures" such as open water can be seen and identified from remotely sensed imagery. Wetlands in which saturation as opposed to ponding or flooding is the primary source of hydrology often will not be detected by the NWI. Wetland size also is a factor that determines the likelihood of wetlands being identified by the NWI surveys. There is no absolute minimum size necessary for a wetland to be included on an NWI database, but commonly, wetlands smaller than one acre will be missed.

Following this "office" investigation, the area within the boundaries of CHCH (Figures 1) was systematically searched on foot to identify areas that potentially might meet the criteria to be considered a jurisdictional wetland according to the WDM (U.S. Army Corps of Engineers

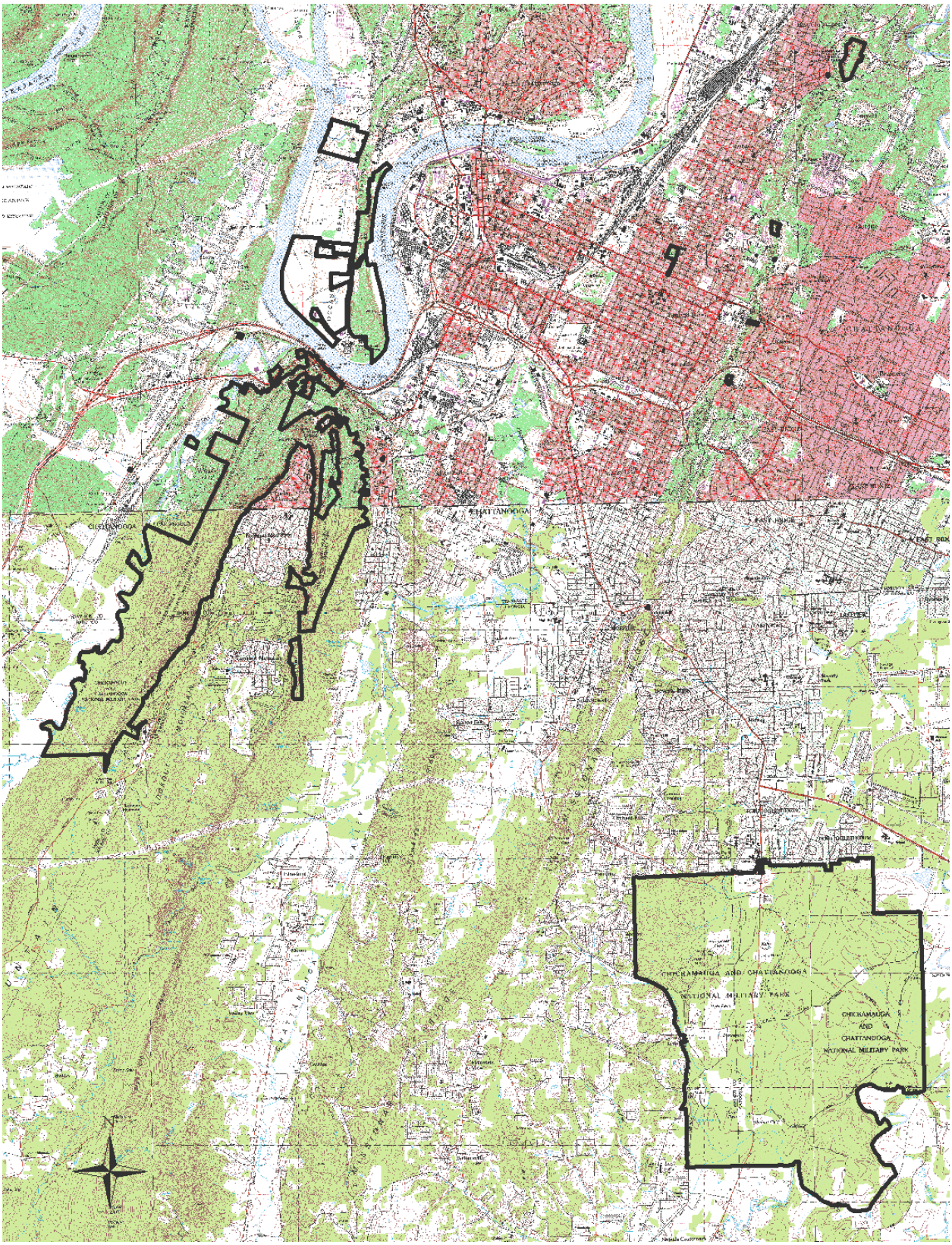


Figure 1. Location of Chickamauga and Chattanooga National Military Park.

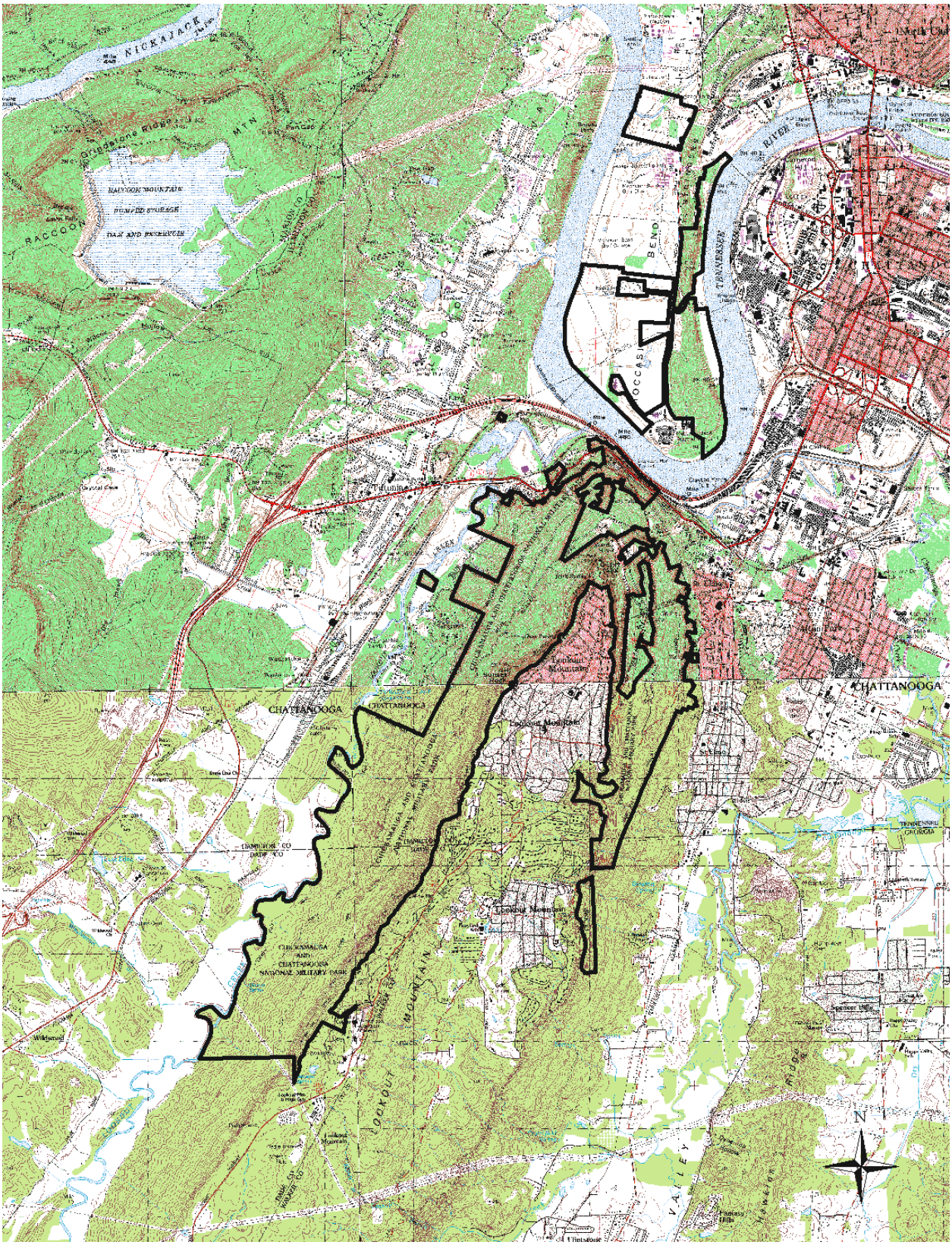


Figure 1a. Location of Chickamauga and Chattanooga National Military Park (Northern Portion).

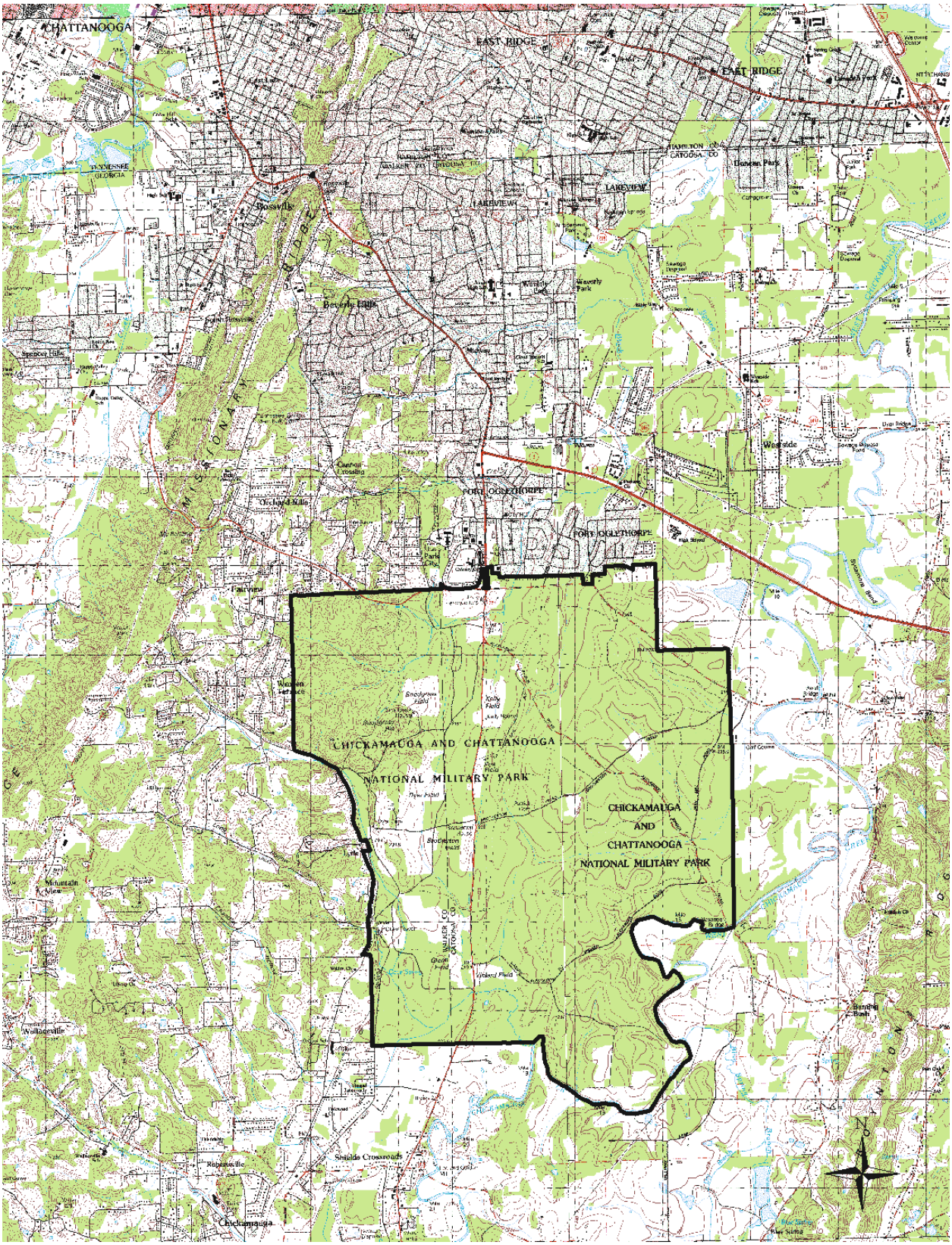


Figure 1b. Location of Chickamauga and Chattanooga National Military Park (Southern Portion).

1987). Detailed topographic maps that included the network of roads and trails within LIRI, along with a Global Positioning System (GPS) receiver were used as navigation aids in the field. The primary indicators of potential wetlands were the presence of surface water, an obvious change in vegetation cover, and the presence of plant species known to occur primarily in wetlands.

Whenever potential wetland areas were located, procedures prescribed by the WDM (U. S. Army Corps of Engineers 1987) were employed to: (1) determine if the area was a wetland, and if so, (2) delineate the boundary of the wetland. This process involved documenting the dominant plant species and carefully examining potential indicators of soils and hydrology. The dominant plant species in all strata (i.e., tree, shrub, ground, and woody vine) were identified to species if possible using Radford et al. (1968) and Godfrey and Wooten (1979) and their indicator status (obligate, facultative wetland, etc.) was determined from Reed (1988) (Table 1). If more than 50% of the dominant species were facultative, facultative wetland, or obligate, then the site was considered dominated by hydrophytic vegetation. Soils were exposed either by digging a series of pits with a sharpshooter shovel, or extracting samples with a soil probe to a depth of approximately 18 inches. Color of the soil matrix (the primary color) and of the mottles (splotches of color within the matrix, if present) was described using standard Munsell color notation. Indicators of "hydric" soil also were noted (USDA, NRCS 2002, and U. S. Army Corps of Engineers 1987). The primary one used in this study was the presence of low matrix chromas (i.e., those < 2). This indicator develops as a result of prolonged reduction; thus it can be inferred that the site is flooded, ponded, or saturated for long periods during the growing season. A determination of whether the site had a hydroperiod prolonged enough to be

considered "wetland hydrology" was made based on field indicators described in the WDM (U. S. Army Corps of Engineers 1987).

Table 1. Wetland indicator definitions according to Reed (1988) used to determine the indicator status of plant species recorded in wetlands at CHCH National Military Park.

Category	Abbreviation	Definition
Obligate Wetland	OBL	Almost always occur (estimated probability >99%) in wetlands under natural conditions
Facultative Wetland	FACW	Usually occur in wetlands (estimated probability 67-99%), but occasionally found in non-wetlands
Facultative	FAC	Equally likely to occur in wetlands or non-wetlands (estimated probability 33-66%)
Facultative Upland	FACU	Usually occur in non-wetlands (estimated probability 67-99%), but occasionally found in wetlands
Upland	UPL	Almost always occur (estimated probability >99%) in non-wetlands under natural conditions

Two used in this study were soil saturation within 12 inches of the surface and the presence of. oxidized rhizospheres. Additional information regarding each of the indicators/parameters of wetland hydrology can be found in the WDM (U. S. Army Corps of Engineers 1987).

Once an area was determined to be a wetland, its boundaries were delineated based on the presence or absence of each of the three parameters (soils, hydrology, and vegetation). A flag or other marker was placed in the ground to indicate the point at which one or more of the parameters ceased to be present, thus denoting the edge of the wetland. Wetland size was estimated by approximating a geometric figure (square, rectangle, circle, etc.) and using a rangefinder to determine distances needed for the appropriate calculations.

Universal Transverse Mercator (UTM) coordinates for each wetland were determined using a handheld GPS receiver. Coordinates were stored in the receiver and recorded on field data sheets. After each field sampling period, the UTM coordinates were transferred to a Geographic Information System (GIS) and graphically represented using ArcView© software. By continuously updating the GIS database (and maps), areas of CHCH that still needed to be searched could be identified.

Each wetland was assigned to the most detailed Cowardin and HGM class possible. The Cowardin classification uses an alphanumeric code to denote characteristics of the wetland. The first character is an upper case letter that represents the *system*. All the wetlands at CHCH were classified within the palustrine system. The palustrine system includes most interior freshwater wetlands not associated with large open water bodies and is denoted on NWI maps by the letter P. Next is a set of two upper case letters that represent the *class*. For the wetlands at CHCH, the potential classes included: EM - emergent wetland (dominated by non-woody vegetation), SS - scrub/shrub (dominated by woody vegetation < 3 inches in diameter and < 20 feet tall), and FO - forested (dominated by woody vegetation 3 inches or greater in diameter and at least 20 feet tall). The next character is a number representing the *subclass*. These modifiers provide more detail regarding the plant community and they vary with the class. For example, in emergent wetlands at CHCH, the most common modifier used was "1" – persistent plant species that commonly remain standing until the next growing season. The other modifier in this subclass is "2" - non-persistent (plant species that do not remain standing until the next growing season). In scrub/shrub wetlands at CHCH, the modifier used was "1" – broad-leaf deciduous plants that lose their leaves in winter. Other examples of this modifier include needle-leaved deciduous, and broad-leaved evergreen. The next character is an upper case letter that represents the water

regime (i.e., the hydroperiod). Examples of modifiers include: A - temporarily flooded (typically floods for < 2 weeks during the growing season), and C - seasonally flooded (typically floods for two or more weeks during the growing season). As an example, a wetland assigned a code of PSS1A is a freshwater wetland not associated with a lake or open water body that is dominated by deciduous, scrub-shrub vegetation and is inundated for less than two weeks during the growing season. A complete explanation of these notations can be found in Cowardin et al. (1979).

In the HGM system, the classes that potentially could occur at CHCH were riverine, depression, slope, mineral soil flat, and lacustrine fringe. Further designations are not as structured as in Cowardin and vary among classes. Examples of factors that potentially could be used to assign wetlands to the more-detailed subclass level include: stream gradient (high or low) for riverine wetlands, landscape form (open or closed contours) for depressions, and primary source of hydrology (ground or surface water) for depressions. Vegetation usually is not considered formally when determining class or subclass within the HGM classification system.

The initial list of potential functions/values (biotic, hydrologic, research/scientific, cultural, and economic) was reviewed to determine their applicability to the wetland types most likely to occur at CHCH. Further, a review of HGM guidebooks, the scientific literature, and previous inventory and assessment work completed in the region was conducted to identify the physical, chemical, and biological characteristics of the wetlands responsible for the performance of the function(s). Based on this preliminary work, eight specific functions/values believed to be the most relevant at CHCH were selected for evaluation. These included: surface water storage, groundwater discharge to streams, carbon/nutrient export, provide wildlife habitat, support wetland plants, cultural value, research/scientific value, and economic value. These

functions/values along with a section in which ratings could be recorded were included on the field data form.

The functions/values of each wetland identified at CHCH were evaluated by visually examining the characteristics of wetlands likely to be related directly to one or more functions/values. The following references provided background regarding these characteristics and recommendations on how they can be estimated: Mueller-Dombois and Ellenberg (1974) and Hays et al. (1981) for plant and habitat-related parameters; Brady and Weil (1999) for soil and soil-related parameters; and Ponce (1989) for hydrologic parameters. Examples of characteristics presumed to be related to the capacity of the wetlands to perform one or more functions include: species composition of the vegetation in the overstory, midstory, and understory layers, diameter at breast height (DBH) of the overstory and midstory trees, density of saplings and shrubs, size and density of logs and snags, percent cover of understory vegetation, and percent cover of litter. Non-vegetation characteristics included hydrology source (i.e., flooding, ponding, or saturation), timing and duration of inundation or saturation, depth to the seasonal high water table, landscape position (i.e., HGM classification, proximity to stream or river, etc.), and soil characteristics (i.e., color, depth to redoximorphic features, texture, presence or confining layers, etc.). Nominal ratings of high, medium, or low were used for three functions; high and low only for two functions; and yes or no for the three "values." The following sections provide a description of each function/value and an overview of the characteristics and conditions used to derive the ratings. More detail regarding the logic used to assign ratings to various wetland functions can be found in Ainslie et al. (1999), Smith and Klimas (2002), and Wilder and Roberts (2003). Wetland size is an obvious factor related to all functions or values. In many instances larger wetlands provide increased function and value

over that produced by smaller wetlands. Size however is not considered directly in the HGM process. If desired, users can incorporate size into the comparison when two or more wetlands are being assessed.

Surface Water Storage

This function addresses the capacity of the wetland to store surface water during periods of high rainfall and runoff**.** It is performed by wetlands in both the depression and riverine classes. Many benefits related to flood attenuation and the reduction of flood damage occur as a result of wetlands performing this function. For example, storage of surface water in wetlands can reduce the velocity of the flood-wave and as a result, decrease peak discharge downstream. Similarly, this reduction in velocity can have a dramatic effect in reducing damage from erosive forces.

Wetlands at CHCH were assigned a rating of either high or low for this function based solely on HGM classification. Depressions occur in both upland and floodplain locations and vary greatly in size. Regardless of their location or size, depressions store water so they were assigned a rating of high for this function. Riverine wetlands (i.e., those on floodplains) adjacent to mid-and low-gradient streams or rivers also store water, so those in this landscape position also scored high. Other types of wetlands do not store surface water and were assigned a rating of low or not applicable for this function.

Ground Water Discharge to Streams

This function addresses the capacity of the wetland to retain and convey subsurface water to an adjacent stream or river; it is performed most commonly by wetlands in the HGM riverine and slope classes. Subsurface water stored in or moving through the wetland will be released more slowly than would surface flow. This slow release is important in maintaining water levels

in the channel during periods of low rainfall, that in turn is important in developing and maintaining habitat structure and biotic diversity in stream or river systems.

Wetlands at CHCH were assigned a rating of high or low for this function based on HGM classification and landscape position. Only riverine and slope wetlands adjacent to a stream or river have the opportunity to facilitate the slow release of water to maintain baseflow; those that met this condition received a score of high. Conversely, wetlands not directly adjacent to a stream or river were assigned a score of low or not applicable for this function.

Carbon/Nutrient Export

This function addresses the capacity of the wetland to export dissolved and particulate organic carbon and other nutrients present in the wetland to downgradient systems by leaching and flushing litter via overland flow. Wetlands in the riverine and slope HGM classes perform this function most commonly. Many benefits accrue from the performance of this function. Material exported to downstream systems is vital for supporting aquatic food webs and numerous biogeochemical processes. Dissolved organic carbon is a significant source of energy for the microorganisms that form the base of detrital food webs, while particulate carbon is used to support invertebrate shredders.

Wetlands at CHCH were assigned a rating of high, medium, or low for this function based on HGM classification, landscape position and condition of the plant community. First, only wetlands directly adjacent to a stream or river have the opportunity to export significant amounts of carbon, so this condition had to be met before a score could be assigned. Wetlands that were not adjacent to a stream or river were assigned a score of not applicable for this function. Second, only wetlands with a well-developed plant community have the potential to produce substantial amounts of organic carbon and other nutrients. Assuming wetlands at

CHCH were forested historically, only wetlands in which all vegetation strata (understory, midstory, and overstory) were present received a high score for this function. Wetlands with two strata received a score of medium, while those with only one stratum received a score of low. These conditions were determined onsite, but can be approximated by the Cowardin classification. In most cases palustrine forested (PFO) wetlands are comprised of three strata, palustrine scrub/shrub (PSS) wetlands of two strata, and palustrine emergent (PEM) wetlands of only one stratum

Provide Wildlife Habitat

This function addresses the capacity of the wetland to provide habitat for wildlife either periodically or year around. This function is somewhat unique in that wetlands in all HGM classes support various species of wildlife. The focus of this assessment was on amphibians, a group of organisms that is dependent on wetlands for completing their life cycle in that generally they must lay their eggs in water or saturated soil. Amphibians have experienced worldwide population declines, thus they are ideal for serving as the emphasis of this function.

Wetlands were assigned a rating of high, medium, or low for this function based on their hydrologic regime. Only wetlands with prolonged hydroperiods i.e. (standing water for two or more weeks during the growing season) have the potential to provide breeding habitat for amphibians, so only these wetlands could receive a high score for this function. Such wetlands often are referred to as vernal pools and typically belong to the HGM depression class; although, wetlands in other classes may contain depressions within their boundaries. Wetlands in which only short-term ponding occurred were assigned a score of medium. These mostly could be characterized as micro-depressions. Wetlands in which only soil saturation occurred were assigned a score of low for this function.

Support Wetland Plants

This function addresses the capacity of the wetland to support a plant community comprised primarily of species associated with wetland ecosystems. In this study, the emphasis was placed on species found only or primarily in wetlands (i.e., the obligate and facultative wetland groups described by Reed (1988)). In addition to the inherent value of the plants themselves, the plant community in most instances is one of the major factors upon which the animal community depends. Further, the plant community is the ultimate source of primary production and as such essentially drives many of the other functions such as on-site cycling of nutrients and production of material for export to other systems.

Wetlands were assigned a score for this function based on the uniqueness of the plant community present. Wetlands that were dominated by unique species, particularly those in the obligate category or those wetlands containing a rare, threatened, or endangered plant species were assigned a score of high. Wetlands that were dominated by species in the facultative wetland category were assigned a score of medium. Wetlands dominated by species in the facultative or drier category were assigned a score of low.

Cultural Values

Cultural values include a broad array of concepts ranging from aesthetics to archeological significance. The values differ somewhat from those derived from the above functions, but are extremely important at a facility such as CHCH where consideration for the experiences of the visiting public is a high priority.

Wetlands at CHCH were assigned either a “yes” or “no” (i.e., either having or not having value) for this category. Factors that were considered were uniqueness, size (the larger the better), evidence of historical use by humans, proximity to trails and roads (important

consideration for environmental education), etc. It could be argued that all wetlands have cultural significance in the form of aesthetics and potential for environmental education; but, unless a wetland "stood out" for one or more of the above reasons, it was given a rating of "no." As an example, wetlands that were less than average size, had no apparent evidence of past human activity and were not readily accessible by the public, were not considered to have cultural significance. Reasons for rating wetlands as having cultural significance were noted on the field forms. Nothing was noted for wetlands judged to lack cultural significance.

Research/Scientific Value

Research/scientific values include a broad array of concepts ranging from supporting unique species that warrant investigation to serving as "reference" sites to promote a better understanding of ecosystems and how they may become degraded, be restored, or managed. As with cultural considerations, these values differ somewhat from those derived from the above ecological functions.

Wetlands at CHCH were assigned either a "yes" or "no" (i.e., either having or not having value) for this category. Factors that were considered included uniqueness, size, degree of disturbance, and presence of species of high interest. It could be argued that all wetlands have research/scientific value; but, unless a wetland "stood out" for one or more of the above reasons, it was given a rating of "no." Reasons for rating wetlands as having research/scientific value were noted on the field forms. Nothing was noted for wetlands judged to have no research/scientific potential.

Economic Values

Economic values may be derived from resources produced by or within the wetland or may be due to some function that the wetland performs. Examples of the former include timber

or fisheries production. Examples of the latter include the value of the wetland for reducing flooding downstream because of water storage capacity.

Wetlands at CHCH were assigned either a "yes" or "no" (i.e., either having or not having value) for this category. The two factors that were considered were the ability of the wetland to serve as an attraction to visitors and the value of the wetland for reducing flood damage. Given that CHCH is a NPS facility, values associated with timber and commercial exploitation of wildlife and other natural resources were not considered. Reasons for rating wetlands as having economic value were noted on the field forms. Nothing was noted for wetlands judged to have no economic value.

RESULTS

This park is somewhat unique among other parks within the Cumberland Piedmont Network in that the it is divided into somewhat distinct areas; Chickamauga Battlefield, Lookout Mountain, Moccasin Bend and Missionary Ridge. The NWI maps indicated approximately eighteen wetlands were present at CHCH; however, field investigation documented the presence of one hundred seventy-nine wetlands (Figures 2). The limitations of the NWI information mentioned previously simply had not permitted the additional wetlands to be identified, likely because of small size and the absence or short duration of standing water. These wetlands totaled approximately two hundred seven-nine acres, with the average wetland size being approximately 1.56 acres.

The average wetland size at CHCH is relatively large and is a result of the slope wetland complex associated with the southwestern end of the park. It is approximately one hundred fifty-seven acres in size and supports a great variety of species and habitat types. Excluding this area, the average size of wetlands at CHCH is approximately 0.69 acres. This average acreage figure

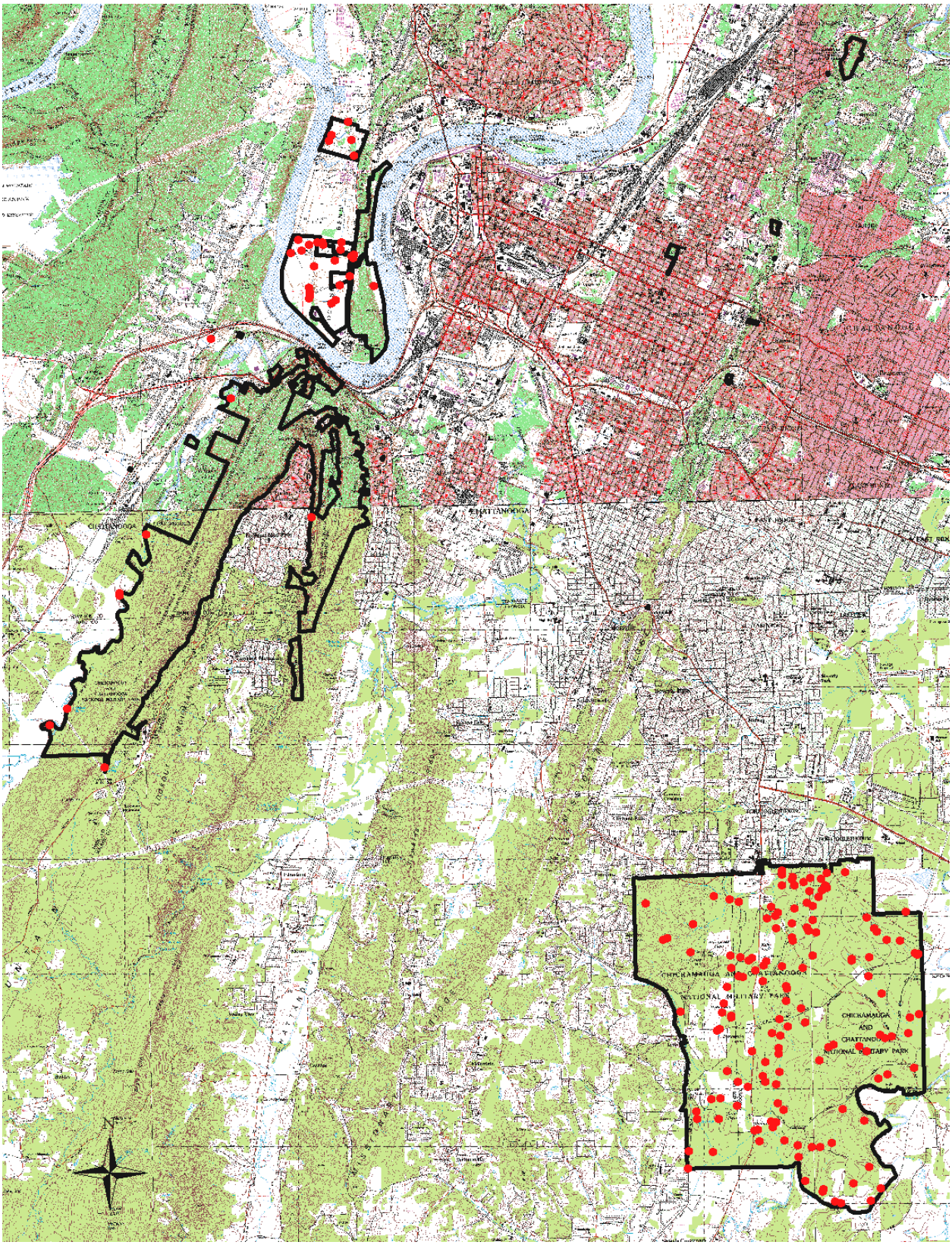


Figure 2. Location of Wetlands at Chickamauga and Chattanooga National Military Park.

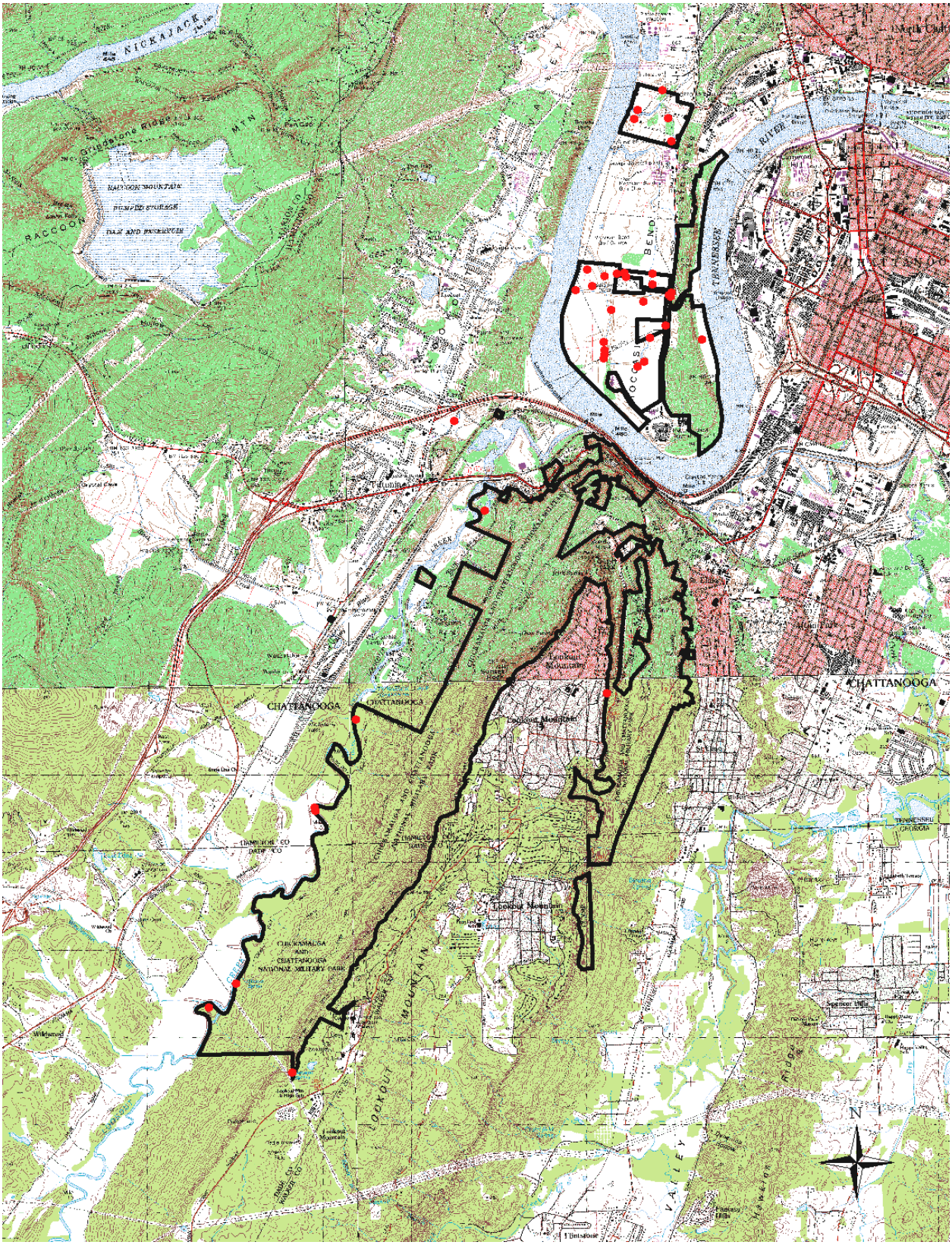


Figure 2a. Location of Wetlands at Chickamauga and Chattanooga National Military Park (Northern Portion).

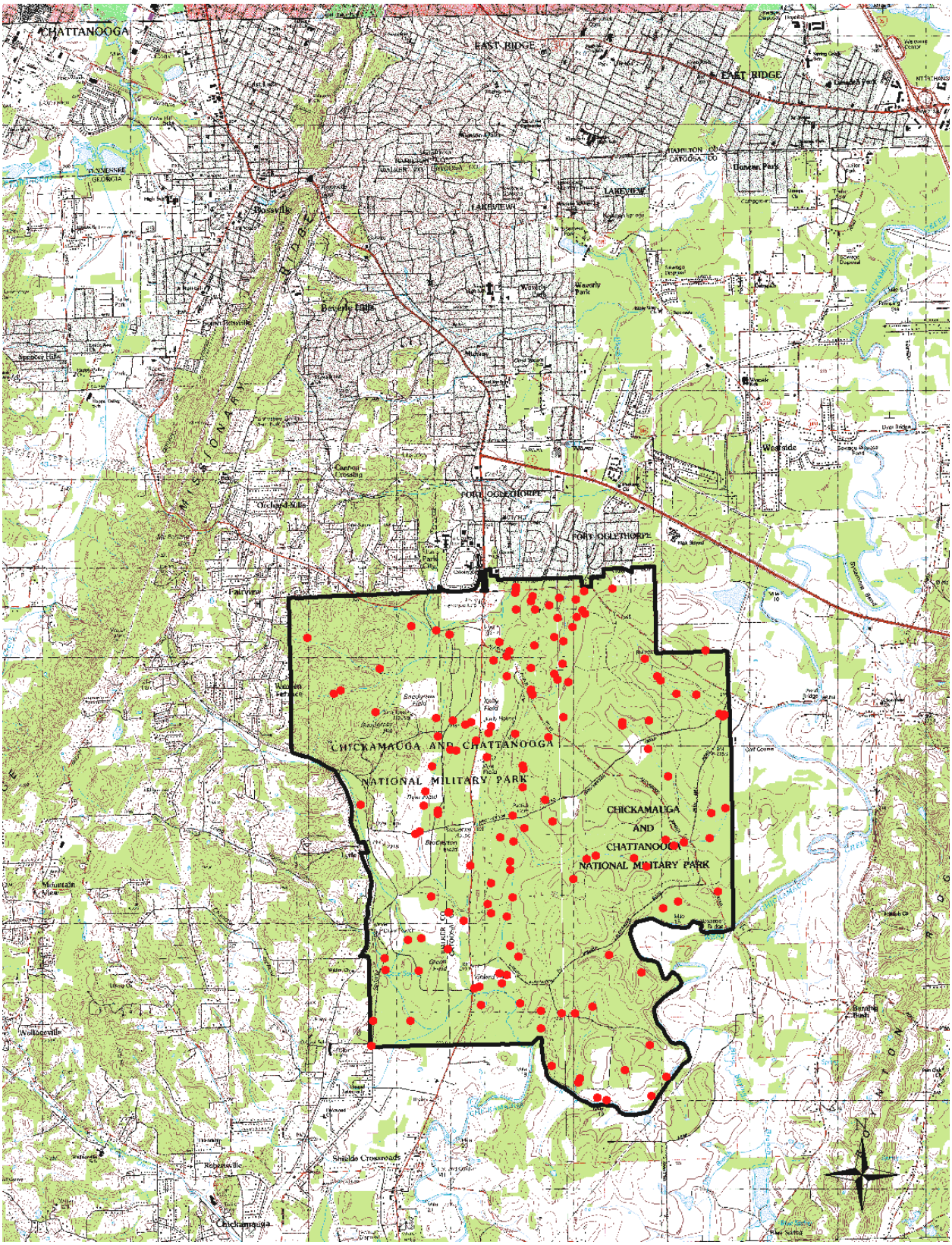


Figure 2b. Location of Wetlands at Chickamauga and Chattanooga National Military Park (Southern Portion).

more accurately characterizes the size of the majority of wetlands at CHCH. Common species in the majority of wetlands at CHCH included sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), willow oak (*Quercus phellos*), European privet (*Ligustrum vulgare*) and Japan grass (*Microstegium viminium*).

Based on the Hydrogeomorphic (HGM) classification system**,** sixty-eight were slope wetlands, fifty-eight were depression wetlands, twenty-nine of the sites were riverine wetlands, and twenty-four were considered flats wetlands. Based on the Cowardin classification system, one hundred thirty-six of the wetlands were palustrine, forested wetlands dominated by deciduous trees (PFO1). Of these, ninety-two were temporarily flooded (PFO1A), thirty-nine were seasonally flooded (PFO1A), and five were seasonally flooded/saturated (PFO1E). Non-forested wetlands included three palustrine scrub-shrub wetlands that were seasonally flooded (PSS1C) and one that was semi-permanently flooded (PSS1E/F). Twenty-two palustrine emergent wetlands were present. Eleven of these were seasonally flooded (PEM1C), nine were temporarily flooded (PEM1A), and two were seasonally flooded/saturated (PEM1E) or semi-permanently flooded. The remaining wetlands were considered to be riverine wetlands. These wetlands were located within headwater stream channels, were generally intermittent in flow, and had various subtrate types (R4SB).

Wilder/Glen-Viniard/Lafayette Road Wetland

Though the approximate average wetland area at CHCH is 0.69 acres, there are several wetlands that are larger. The largest of these occurs in the southwestern corner of CHCH and is approximately one hundred fifty-seven acres in size. The majority of the wetland occurs between Wilder and Glen-Viniard Roads, with some portions of the wetland extending west of LaFayette Road (Figure 3). Using the HGM classification system, this wetland type

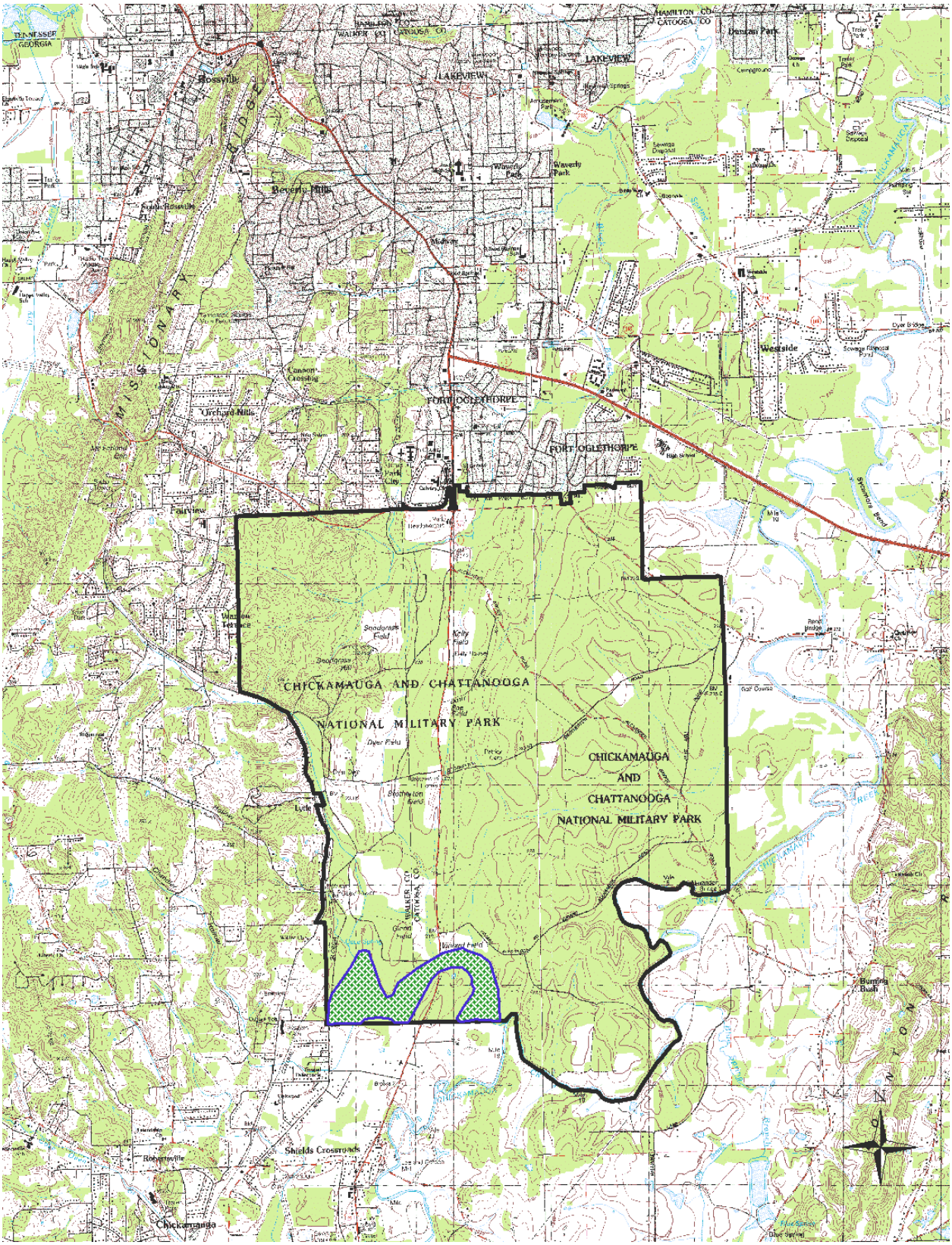


Figure 3. Location of Wilder/Glen-Viniard/Lafayette Road Wetland.

overall, would best be described as a slope wetland complex. Though this wetland is adjacent to a stream, likely, the stream is not the major hydrology source for the wetland. The primary hydrology for such wetlands typically is subsurface groundwater moving along an elevational gradient, not overbank flooding from the stream. Other factors including road crossings and beaver (*Castor canadensis*) activity likely also play a role in the hydrology of this area. Using the Cowardin classification system most of the area would be considered a PFO1A.

CONCLUSIONS

Small wetlands such as the majority found at CHCH have received little attention by researchers and managers, thus these wetlands likely should be investigated further. We commonly observed wetlands holding water or having soils saturated throughout the amphibian breeding. We further documented that many wetlands were being used as breeding habitat by amphibians. Because of the nature of our survey, there was not time to document use by other vertebrate groups. Because wetlands at CHCH exist as unique patches within a mostly upland landscape, their value as water sources for other groups of wildlife could be very significant and should be investigated, especially during prolonged dry periods. This could be accomplished by live-trapping, track counts, or use of remotely-operated cameras.

This inventory documented several previously unknown wetlands, thus the findings will facilitate searches by botanists, herpetologists, and scientists in other disciplines during future research activities. Research regarding species within these various disciplines would be useful in determining the role these wetlands play in maintaining local and regional populations. Further, the genetic makeup of these populations would be of interest to scientists as part of recent endeavors to understand metapopulation dynamics.

Several of the wetlands were of especially high quality and could serve as sites for

scientific studies given that they have not been as severely impacted as most wetlands on private lands. Specifically, the large slope wetland complex associated with southwestern portion of the park is in relatively good hydrologic condition and likely would be useful as a study area for a variety of wetland research topics, though the vegetation of the area has been altered. Both state and federal agencies are currently involved in developing assessment models for various wetland types across the Southeast. Areas such as this one and the numerous other wetlands identified at CHCH likely would add significantly to these research efforts in that most are not as impacted as wetlands on private lands.

ACKNOWLEDGEMENTS

We wish to thank Jerald Moore for developing the GIS database, Jim Szyjkowski and other CHCH staff for providing us with valuable assistance in locating potential wetlands and providing access to all portions of CHCH. We also wish to thank Teresa Liebfreid with the Cumberland Piedmont Network, and the Water Center at Tennessee Tech University for providing support and administering the project.

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APPENDIX A

Wetland photographs and selected data



Site ID – CH 1

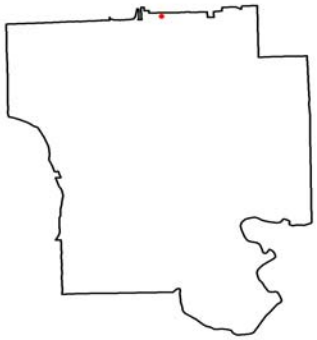
Area (ac) – 0.19

UTM – E 659360

N 3867998

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: ***Vaccinium sp., Fraxinus pennsylvanica, Ulmus rubra***



Site ID – CH 2

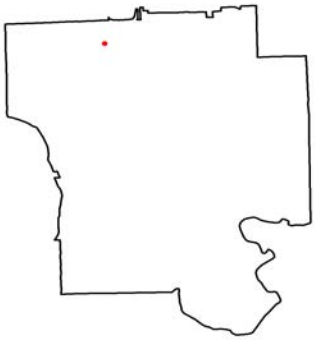
Area (ac) – 0.22

UTM – E 658460

N 3867501

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: ***Celtis lavigata, Ligustrum vulgare, Rumex crispus, Toxicodendron radicans***



Site ID – CH 3

Area (ac) – 0.05

UTM – E 657380

N 3866826

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Acer rubrum, Vitis sp., Liquidambar styraciflua***



Site ID – CH 4

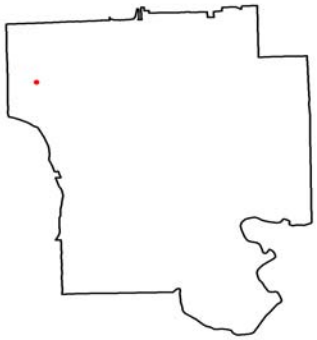
Area (ac) – 0.13

UTM – E 657310

N 3866788

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Vitis sp., Acer rubrum, Liquidambar styracifula, Nyssa sylvatica***



Site ID – CH 5

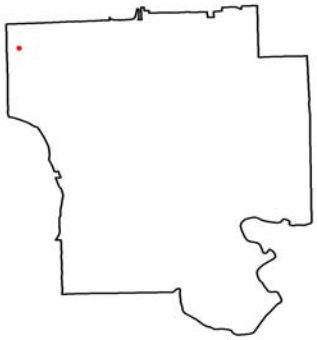
Area (ac) – 0.07

UTM – E 657007

N 3867421

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Acer rubrum, Ulmus americana, Ligustrum vulgare, Toxicodendron radicans*



Site ID – CH 6

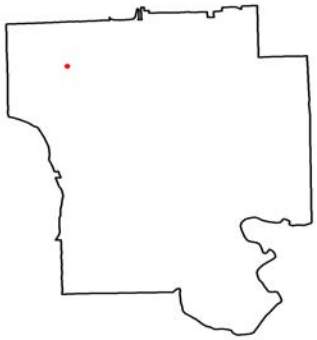
Area (ac) – 0.02

UTM – E 657823

N 3867072

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Fraxinus pennsylvanica, Quercus phellos, Ligustrum vulgare, Impatiens capensis***



Site ID – CH 7

Area (ac) – 0.11

UTM – E 659081

N 3866423

Cowardin Class – PEM1A

HGM Class – Slope



Dominant Species: *Schedonorus phoenix, Carex vulpinoides, Carex tribuloides*



Site ID – CH 8

Area (ac) – 1.80

UTM – E 659050

N 3866346

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: *Quercus phellos, Liquidambar styraciflua, Pinus taeda, Fraxinus pennsylvanica*



Site ID – CH 9

Area (ac) – 0.05

UTM – E 658586

N 3863908

Cowardin Class – PEM1A

HGM Class – Slope



Dominant Species: *Schedonorus phoenix, Panicum rigidulum*



Site ID – CH 10

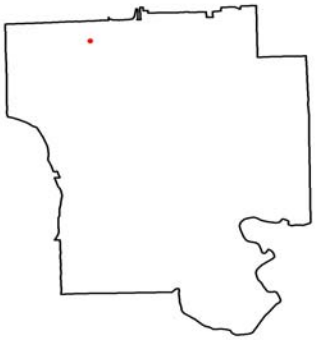
Area (ac) – 0.004

UTM – E 658178

N 3867552

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Acer rubrum, Campsis radicans, Liquidambar styraciflua***



Site ID – CH 11

Area (ac) – 6.90

UTM – E 658788

N 3866438

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: *Quercus phellos, Quercus alba, Liquidambar styraciflua, Toxicodendron radicans*



Site ID – CH 12

Area (ac) – 0.01

UTM – E 658606

N 3867458

Cowardin Class – PEM1C

HGM Class – Depression



Dominant Species: *Scirpus cyperinus*, *Carex crinita*



Site ID – CH 13

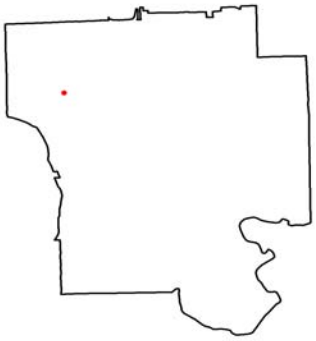
Area (ac) – 0.12

UTM – E 657781

N 3866581

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Acer rubrum*



Site ID – CH 14

Area (ac) – 0.10

UTM – E 658581

N 3866310

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: *Quercus phellos, Fraxinus pennsylvanica, Carex tribuloides, Carex vulpinoides*



Site ID – CH 15

Area (ac) – 0.03

UTM – E 658640

N 3866488

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: *Carex tribuloides, Diodia virginiana, Ulmus americana, Quercus phellos*



Site ID – CH 16

Area (ac) – 0.42

UTM – E 658849

N 3866470

Cowardin Class – PEM1A

HGM Class – Flat



Dominant Species: *Schedonorus phoenix, Carex tribuloides, Toxicdendron radicans*



Site ID – CH 17

Area (ac) – 0.06

UTM – E 658903

N 3866264

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: *Quercus phellos, Ulmus americana, Toxicodendron radicans*



Site ID – CH 18

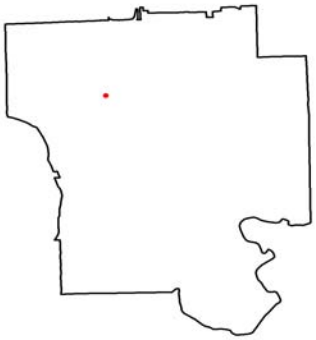
Area (ac) – 0.05

UTM – E 658467

N 3866519

Cowardin Class – PSS1C

HGM Class – Depression



Dominant Species: *Fraxinus pennsylvanica, Toxicodendron radicans, Quercus phellos*

Site ID – CH 19

Area (ac) – 0.49

UTM – E 658617

N 3866161

Cowardin Class – PFO1E

HGM Class – Depression



Dominant Species: *Quercus phellos*, *Lemna sp.*



Site ID – CH 20

Area (ac) – 0.30

UTM – E 658685

N 3866148

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: *Quercus alba, Acer rubrum, Quercus phellos*



Site ID – CH 21

Area (ac) – 0.02

UTM – E 658488

N 3865476

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: *Quercus phellos, Campsis radicans, Smilax rotundifolia*



Site ID – CH 22

Area (ac) – 0.02

UTM – E 658485

N 3865433

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: *Fraxinus pennsylvanica, Quercus phellos, Smilax rotundifolia*



Site ID – CH 23

Area (ac) – 0.02

UTM – E 658280

N 3865239

Cowardin Class – PEM1A

HGM Class – Depression



Dominant Species: *Scirpus cyperinus, Schedonorus phoenix, Diodia virginiana*



Site ID – CH 24

Area (ac) – 0.33

UTM – E 658321

N 3865531

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Quercus phellos, Ligustrum vulgare, Toxicodendron radicans*



Site ID – CH 25

Area (ac) – 2.60

UTM – E 658346

N 3865688

Cowardin Class – PEM1C

HGM Class – Slope



Dominant Species: *Scirpus cyperinus, Carex gigantea, Diodia virginiana*



Site ID – CH 26

Area (ac) – 2.60

UTM – E 658413

N 3865974

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: *Liquidambar styraciflua, Quercus alba, Ulmus americana, Toxicodendron radicans*



Site ID – CH 27

Area (ac) – 0.06

UTM – E 657607

N 3865539

Cowardin Class – PEM1A

HGM Class – Depression



Dominant Species: *Scirpus cyperinus*, *Carex vulpinoides*



Site ID – CH 28

Area (ac) – 0.01

UTM – E 658840

N 3864855

Cowardin Class – PEM1C

HGM Class – Slope



Dominant Species: *Scirpus atrovirens, Scirpus cyperinus*

Site ID – CH 29

Area (ac) – 0.20

UTM – E 658404

N 3864505

Cowardin Class – PEM1F

HGM Class – Depression



Dominant Species: *Carex gigantea, Lemna sp.*

Site ID – CH 30

Area (ac) – 0.30

UTM – E 658592

N 3864319

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: ***Diodia virginiana, Ligustrum vulgare, Platanus occidentalis, Fraxinus pennsylvanica***



Site ID – CH 31

Area (ac) – 0.08

UTM – E 658764

N 3864225

Cowardin Class – PEM1C

HGM Class – Riverine



Dominant Species: *Eleocharis linearis, Scirpus atrovirens*



Site ID – CH 32

Area (ac) – 0.12

UTM – E 658232

N 3865212

Cowardin Class – PSS1C

HGM Class – Riverine



Dominant Species: *Salix nigra, Typha latifolia, Scirpus atrovirens*



Site ID – CH 33

Area (ac) – 0.15

UTM – E 658294

N 3864029

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: ***Liquidambar styraciflua, Ulmus rubra, Ligustrum vulgare, Toxicodendron radicans***



Site ID – CH 34

Area (ac) – 0.25

UTM – E 658140

N 3864013

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Ligustrum vulgare, Liquidambar styraciflua, Ulmus rubra*



Site ID – CH 35

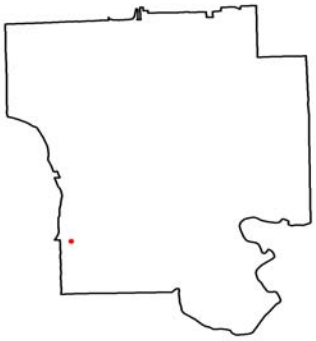
Area (ac) – 0.06

UTM – E 657879

N 3863805

Cowardin Class – PSS1C

HGM Class – Depression



Dominant Species: ***Fraxinus pennsylvanica, Ulmus rubra, Acer negundo, Campsis radicans***



Site ID – CH 36

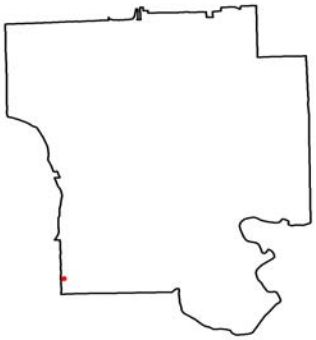
Area (ac) – 157.24

UTM – E 657748

N 3863103

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Fraxinus pennsylvanica, Quercus phellos, Campsis radicans, Symphyotrichum lanceolatum***



Site ID – CH 36B

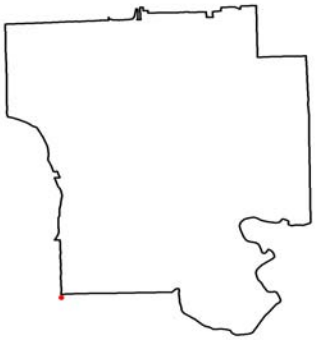
Area (ac) – *cont.*

UTM – E 657728

N 3862815

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Quercus alba, Quercus phellos, Liquidambar styraciflua, Ligustrum vulgare*



Site ID – CH 36C

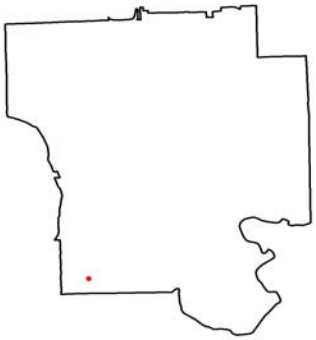
Area (ac) – *cont.*

UTM – E 658169

N 3863097

Cowardin Class – PSS1E

HGM Class – Slope



Dominant Species: *Carex gigantea, Leersia oryzoides, Fraxinus pennsylvanica, Lemna sp.*



Site ID – CH 36D

Area (ac) – *cont.*

UTM – E 657893

N 3863676

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Asimina triloba, Acer negundo, Campsis radicans*



Site ID – CH 36E

Area (ac) – *cont.*

UTM – E 658941

N 3863482

Cowardin Class – PFO1C

HGM Class – Slope



Dominant Species: *Ulmus rubra, Quercus phellos*



Site ID – CH 36F

Area (ac) – *cont.*

UTM – E 658884

N 3863471

Cowardin Class – PEM1A

HGM Class – Slope



Dominant Species: *Polygonum hydropepperoides, Diodia virginiana, Festuca sp.*



Site ID – CH 36G

Area (ac) – *cont.*

UTM – E 659201

N 3863526

Cowardin Class – PFO1E

HGM Class – Slope



Dominant Species: *Fraxinus pennsylvanica, Boehmeria cylindrica*



Site ID – CH 36H

Area (ac) – *cont.*

UTM – E 659408

N 3863294

Cowardin Class – PFO1E

HGM Class – Slope



Dominant Species: *Fraxinus pennsylvanica, Quercus lyrata, Saururus cernuus, Carex sp.*



Site ID – CH 40

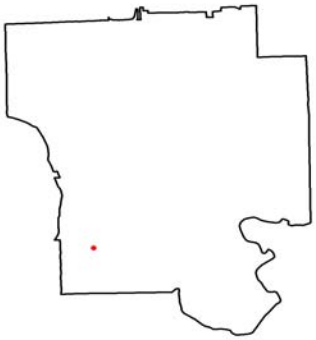
Area (ac) – 2.92

UTM – E 658271

N 3863664

Cowardin Class – PFO1C

HGM Class – Flat



Dominant Species: *Quercus phellos*, *Microstegium vimineum*, *Toxicodendron radicans*



Site ID – CH 41

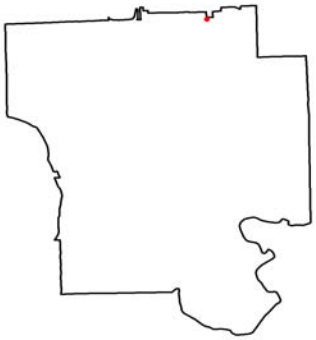
Area (ac) – 0.28

UTM – E 660130

N 3867951

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: ***Toxicodendron radicans, Quercus phellos, Ulmus rubra***



Site ID – CH 42

Area (ac) – 0.06

UTM – E 661663

N 3866563

Cowardin Class – R4SB

HGM Class – Riverine



Dominant Species: ***Carex vulpinoides.***
Scirpus cyperinus



Site ID – CH 43

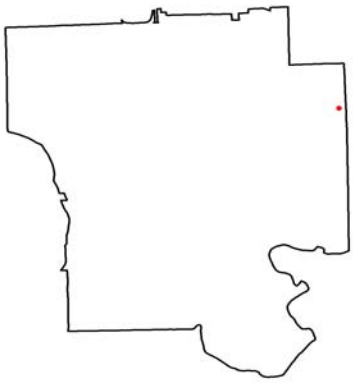
Area (ac) – 0.04

UTM – E 661701

N 3866535

Cowardin Class – R4SB

HGM Class – Riverine



Dominant Species: *Plantago cordata*, *Scirpus cyperinus*



Site ID – CH 44

Area (ac) – 0.005

UTM – E 661397

N 3866776

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: *Acer rubrum, Ulmus rubra, Campsis radicans*



Site ID – CH 45

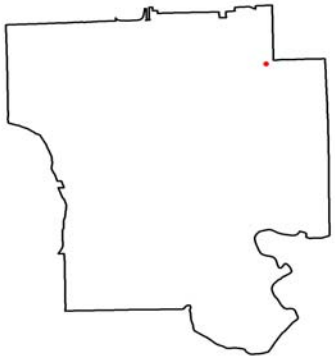
Area (ac) – 0.17

UTM – E 660822

N 3867184

Cowardin Class – PEM1A

HGM Class – Flat



Dominant Species: *Eleocharis sp.*, *Andropogon virginicus*



Site ID – CH 46

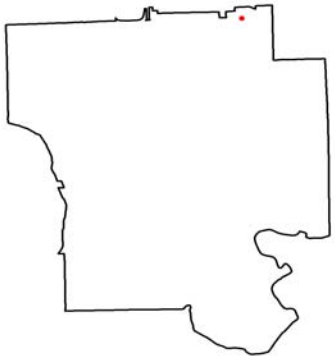
Area (ac) – 0.68

UTM – E 660448

N 3867974

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Celtis laevigata, Ligustrum vulgare, Ulmus rubra*



Site ID – CH 47

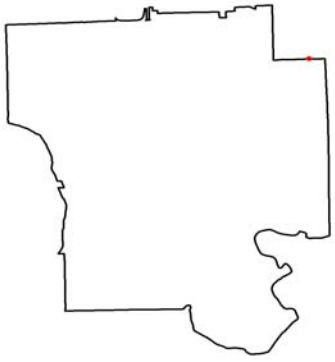
Area (ac) – 0.04

UTM – E 661503

N 3867277

Cowardin Class – PFO1C

HGM Class – Slope



Dominant Species: ***Ulmus americana, Fraxinus pennsylvanica, Celtis laevigata***



Site ID – CH 48

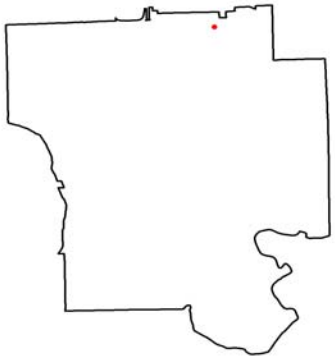
Area (ac) – 0.02

UTM – E 660034

N 3867851

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: ***Ulmus rubra, Ligustrum vulgare, Fraxinus pennsylvanica***



Site ID – CH 49

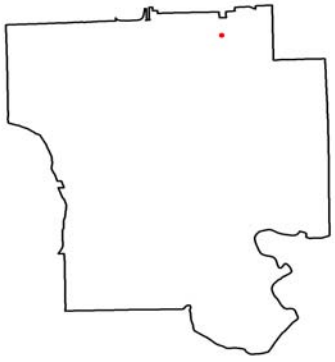
Area (ac) – 0.13

UTM – E 660136

N 3867696

Cowardin Class – PFO1E

HGM Class – Depression



Dominant Species: *Fraxinus pennsylvanica, Celtis laevigata*



Site ID – CH 50

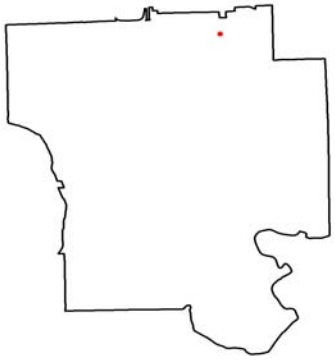
Area (ac) – 0.13

UTM – E 660108

N 3867735

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: *Quercus phellos, Fraxinus pennsylvanica, Toxicodendron radicans*



Site ID – CH 51

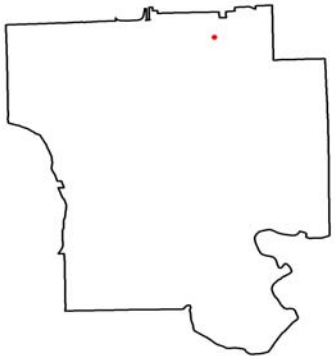
Area (ac) – 3.40

UTM – E 660045

N 3867655

Cowardin Class – PFO1C

HGM Class – Slope



Dominant Species: *Quercus phellos, Celtis laevigata, Ligustrum vulgare, Fraxinus pennsylvanica*



Site ID – CH 52

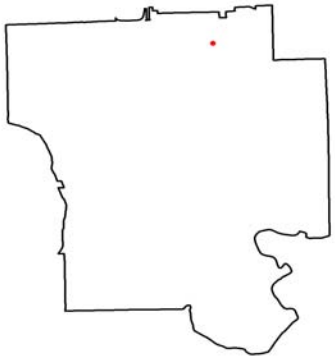
Area (ac) – 6.30

UTM – E 659999

N 3867544

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: ***Toxicodendron radicans, Celtis laevigata, Fraxinus pennsylvanica, Quercus phellos***



Site ID – CH 53

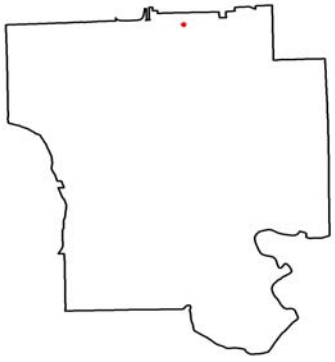
Area (ac) – 0.28

UTM – E 659545

N 3867891

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Ligustrum vulgare, Quercus phellos, Fraxinus pennsylvanica*



Site ID – CH 54

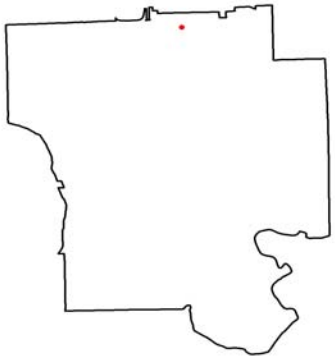
Area (ac) – 0.001

UTM – E 659530

N 3867837

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: ***Toxicodendron radicans, Ligustrum vulgare, Quercus phellos, Vitis sp.***



Site ID – CH 55

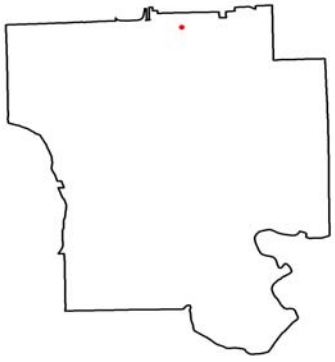
Area (ac) – 0.02

UTM – E 659359

N 3867969

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Ulmus rubra, Fraxinus pennsylvanica, Celtis laevigata*



Site ID – CH 56

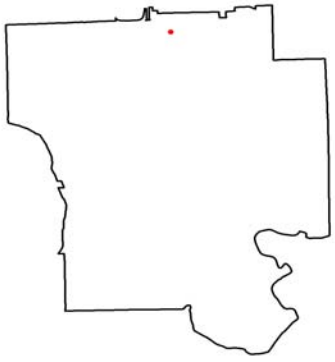
Area (ac) – 0.05

UTM – E 659358

N 3867740

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: *Celtis laevigata, Toxicodendron radicans, Liquidambar styraciflua*



Site ID – CH 57

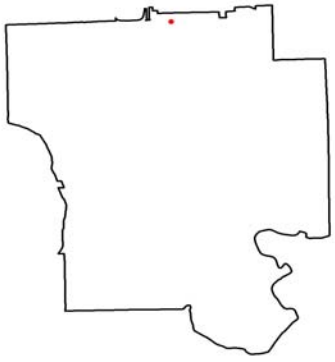
Area (ac) – 0.50

UTM – E 659353

N 3867931

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Toxicodendron radicans, Celtis laevigata***



Site ID – CH 58

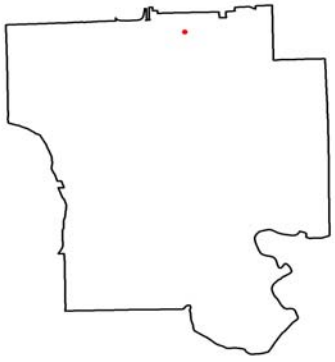
Area (ac) – 0.10

UTM – E 659579

N 3867739

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Celtis laevigata, Toxicodendron radicans, Quercus phellos*



Site ID – CH 59

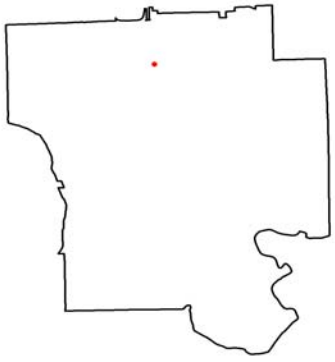
Area (ac) – 0.25

UTM – E 659101

N 3867165

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Celtis laevigata, Ligustrum vulgare, Toxicodendron radicans***



Site ID – CH 60

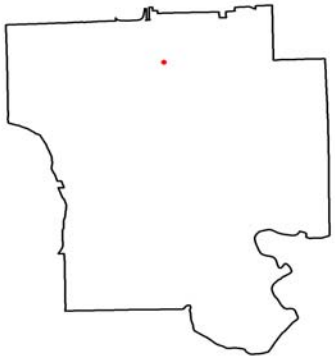
Area (ac) – 0.22

UTM – E 659251

N 3867213

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Celtis laevigata, Liquidambar styraciflua, Microstegium vimineum, Ligustrum vulgare, Fraxinus pennsylvanica***



Site ID –CH 61

Area (ac) – 0.59

UTM – E 659254

N 3866990

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Ulmus rubra, Celtis laevigata, Microstegium vimineum, Liquidambar styraciflua***



Site ID – CH 62

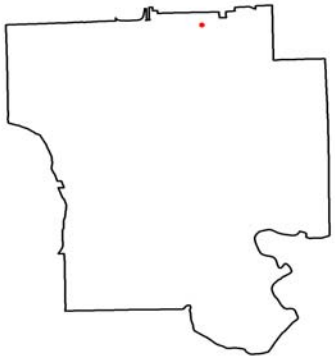
Area (ac) – 0.23

UTM – E 659850

N 3867875

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: *Acer rubrum*, *Smilax rotundifolia*



Site ID – CH 63

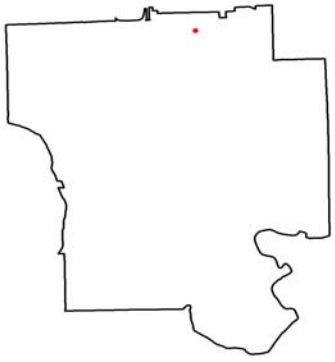
Area (ac) – 0.02

UTM – E 659736

N 3867792

Cowardin Class – PFO1C

HGM Class – Slope



Dominant Species: *Fraxinus pennsylvanica, Microstegium vimineum, Smilax rotundifolia*



Site ID – CH 64

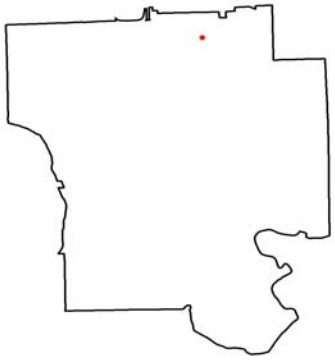
Area (ac) – 0.30

UTM – E 659831

N 3867645

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Toxicodendron radicans, Celtis laevigata, Acer rubrum*



Site ID – CH 65

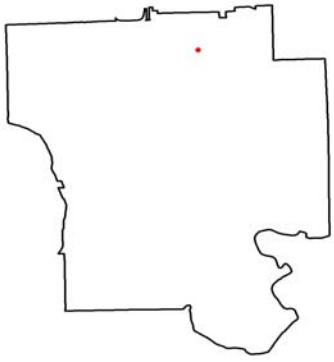
Area (ac) – 0.02

UTM – E 659788

N 3867433

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: *Acer rubrum*, *Smilax rotundifolia*



Site ID – CH 66

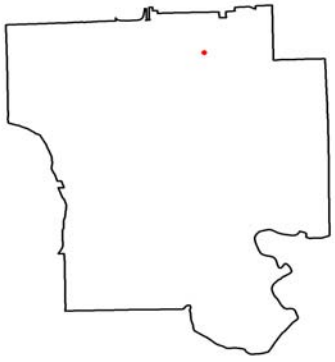
Area (ac) – 2.41

UTM – E 659893

N 3867380

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Acer rubrum, Ligustrum vulgare, Fraxinus pennsylvanica***



Site ID – CH 67

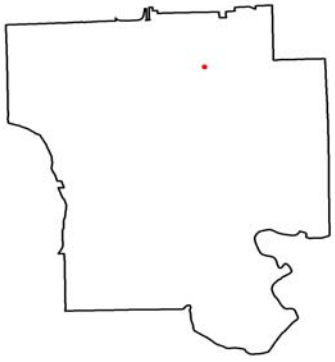
Area (ac) – 0.50

UTM – E 659890

N 3867133

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Celtis laevigata, Ligustrum vulgare, Liquidambar styraciflua, Microstegium vimineum*



Site ID – CH 68

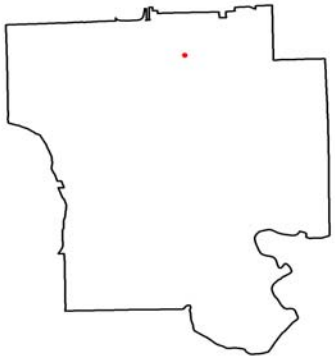
Area (ac) – 1.00

UTM – E 659570

N 3867339

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Celtis laevigata, Acer rubrum, Liquidambar styraciflua, Microstegium vimineum*



Site ID – CH 69

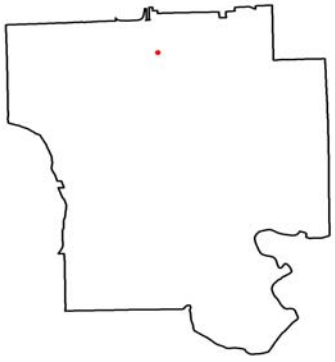
Area (ac) – 0.20

UTM – E 659171

N 3867371

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Celtis laevigata, Ligustrum vulgare, Ulmus rubra*



Site ID – CH 70

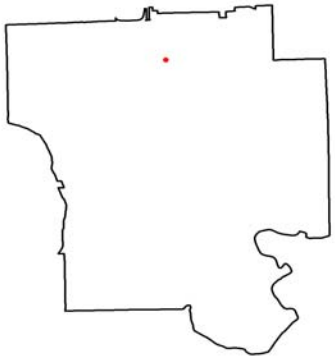
Area (ac) – 0.16

UTM – E 659281

N 3867266

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Microstegium vimineum, Toxicodendron radicans, Ulmus americana*



Site ID – CH 71

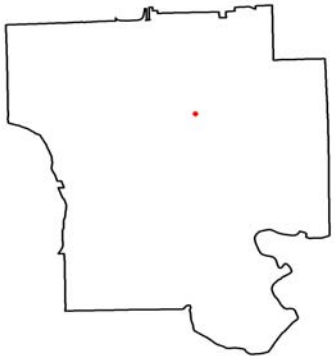
Area (ac) – 0.01

UTM – E 659722

N 3866300

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: ***Scirpus validus, Acer rubrum, Microstegium vimineum, Scirpus cyperinus***



Site ID – CH 72

Area (ac) – 0.52

UTM – E 659430

N 3865981

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: *Acer rubrum*, *Chasmanthium laxum*



Site ID – CH 73

Area (ac) – 0.02

UTM – E 659434

N 3865731

Cowardin Class – PFO1C

HGM Class – Flat



Dominant Species: *Acer rubrum*



Site ID – CH 74

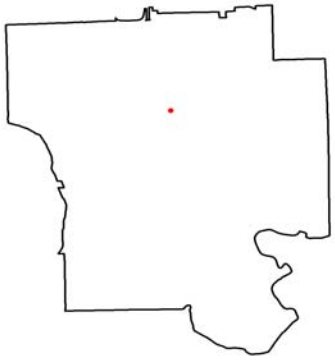
Area (ac) – 0.02

UTM – E 659354

N 3866339

Cowardin Class – PFO1C

HGM Class – Slope



Dominant Species: *Celtis laevigata, Ulmus rubra, Ligustrum vulgare*



Site ID – CH 75

Area (ac) – 0.04

UTM – E 659532

N 3867078

Cowardin Class – PFO1C

HGM Class – Slope



Dominant Species: *Microstegium vimineum, Ulmus americana, Quercus phellos*



Site ID – CH 76

Area (ac) – 0.09

UTM – E 659526

N 3866839

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Celtis laevigata, Ligustrum vulgare, Toxicodendron radicans*



Site ID – CH 77

Area (ac) – 0.03

UTM – E 659547

N 3866782

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Fraxinus pennsylvanica, Ligustrum vulgare, Microstegium vimineum, Ulmus rubra, Toxicodendron radicans***



Site ID – CH 78

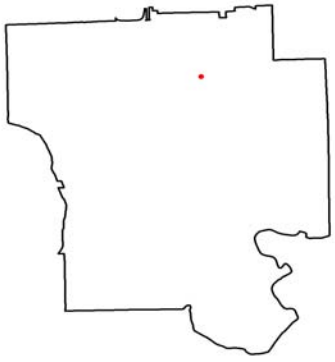
Area (ac) – 0.02

UTM – E 659826

N 3866952

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Celtis laevigata, Ligustrum vulgare, Ulmus americana***



Site ID – CH 79

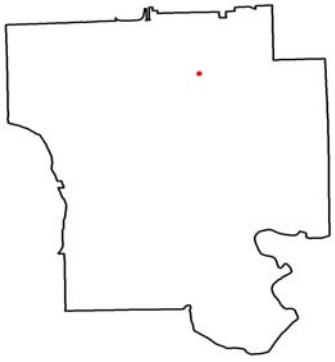
Area (ac) – 0.37

UTM – E 659790

N 3867013

Cowardin Class – PFO1C

HGM Class – Slope



Dominant Species: *Ligustrum vulgare, Celtis laevigata, Fraxinus pennsylvanica*



Site ID – CH 80

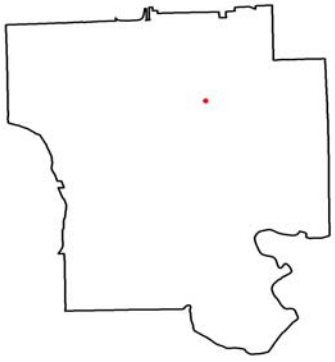
Area (ac) – 0..52

UTM – E 659898

N 3866523

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Celtis laevigata, Ulmus americana, Liquidambar styraciflua*



Site ID – CH 81

Area (ac) – 0.02

UTM – E 659955

N 3866924

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: *Fraxinus pennsylvanica, Ulmus americana, Ligustrum vulgare*



Site ID – CH 82

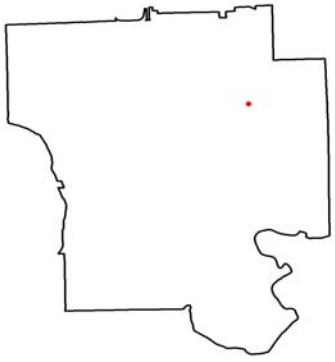
Area (ac) – 0.03

UTM – E 660565

N 3866467

Cowardin Class – R4SB

HGM Class – Riverine



Dominant Species: *Plantago cordata*



Site ID – CH 83

Area (ac) – 0.01

UTM – E 661178

N 3866791

Cowardin Class – R4SB

HGM Class – Riverine



Dominant Species: *Plantago cordata*



Site ID – CH 84

Area (ac) – 0.01

UTM – E 660997

N 3866936

Cowardin Class – R4SB

HGM Class – Riverine



Dominant Species: *Plantago cordata*



Site ID – CH 85

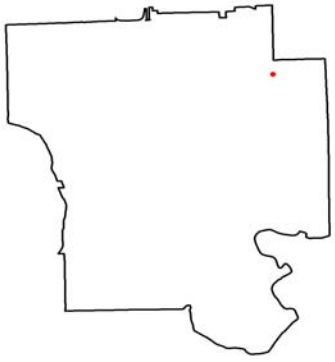
Area (ac) – 0.02

UTM – E 660956

N 3866989

Cowardin Class – R4SB

HGM Class – Riverine



Dominant Species: *Plantago cordata*



Site ID – CH 86

Area (ac) – 0.01

UTM – E 660561

N 3866431

Cowardin Class – R4SB

HGM Class – Riverine



Dominant Species: *Plantago cordata*



Site ID – CH 87

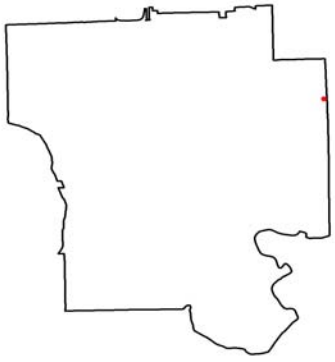
Area (ac) – 0.01

UTM – E 661719

N 3866553

Cowardin Class – R4SB

HGM Class – Riverine



Dominant Species: *Plantago cordata*



Site ID – CH 88

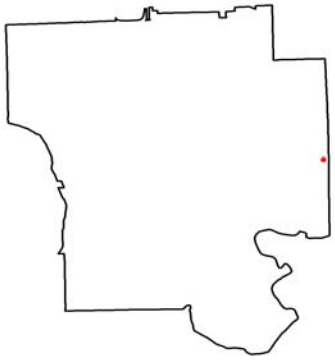
Area (ac) – 7.90

UTM – E 661729

N 3865503

Cowardin Class – PFO1C

HGM Class – Slope



Dominant Species: ***Acer negundo, Acer rubrum, Celtis laevigata***



Site ID – CH 89

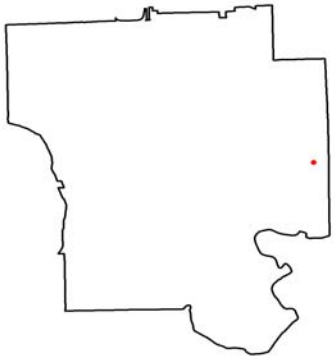
Area (ac) – 1.50

UTM – E 661574

N 3865440

Cowardin Class – PFO1C

HGM Class – Flat



Dominant Species: *Ulmus rubra, Fraxinus pennsylvanica, Carya sp.*



Site ID – CH 90

Area (ac) – 6.20

UTM – E 661548

N 3865163

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: *Celtis laevigata, Ulmus americana, Microstegium vimineum, Vitis sp.*



Site ID – CH 91

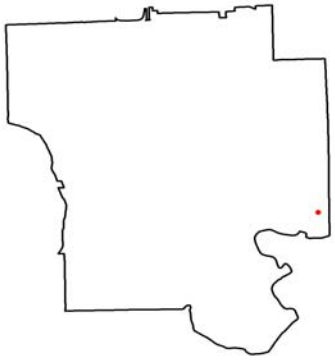
Area (ac) – 2.20

UTM – E 661650

N 3864558

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: *Quercus phellos, Liquidambar styraciflua, Carex gigantea, Lemna sp.*



Site ID – CH 92

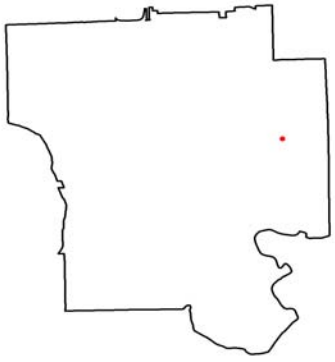
Area (ac) – 0.03

UTM – E 661084

N 3865854

Cowardin Class – R4SB

HGM Class – Riverine



Dominant Species: ***Plantago cordata, Mimulus alatus, Platanus occidentalis***



Site ID – CH 93

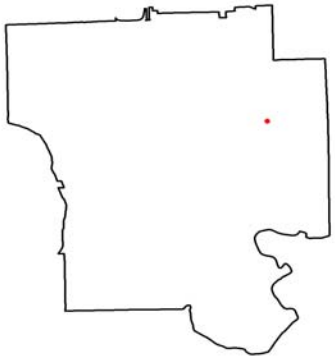
Area (ac) – 0.06

UTM – E 660852

N 3866165

Cowardin Class – PFO1A

HGM Class – Riverine



Dominant Species: *Fraxinus pennsylvanica, Ulmus rubra, Carex sp., Vitis sp.*



Site ID – CH 94

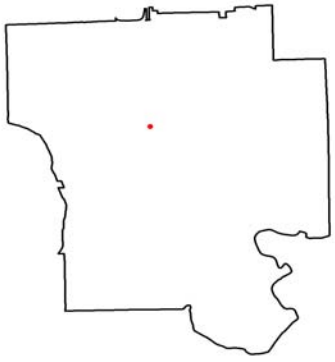
Area (ac) – 2.70

UTM – E 659031

N 3866071

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Toxicodendron radicans, Ulmus americana, Liquidambar styraciflua, Acer rubrum, Quercus phellos***



Site ID – CH 97

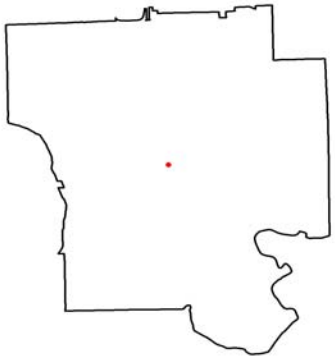
Area (ac) – 0.030

UTM – E 659318

N 3865414

Cowardin Class – PFO1C

HGM Class – Slope



Dominant Species: *Fraxinus pennsylvanica, Toxicodendron radicans, Ulmus americana*



Site ID – CH 98

Area (ac) – 0.070

UTM – E 659448

N 3865938

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: ***Toxicodendron radicans, Ligustrum vulgare, Liquidambar styraciflua***



Site ID – CH 99

Area (ac) – 0.100

UTM – E 659690

N 3865593

Cowardin Class – R4SB

HGM Class – Riverine



Dominant Species: ***Plantago cordata, Ligustrum vulgare***



Site ID – CH 100

Area (ac) – 0.010

UTM – E 659454

N 3865276

Cowardin Class – R4SB

HGM Class – Riverine



Dominant Species: *Plantago cordata*



Site ID – CH 101

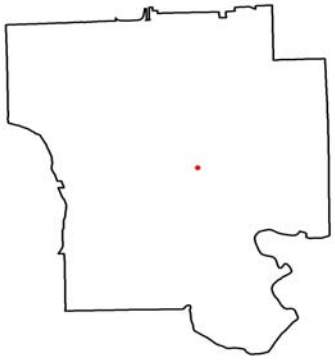
Area (ac) – 0.010

UTM – E 659769

N 3865350

Cowardin Class – R4SB

HGM Class – Riverine



Dominant Species: *Plantago cordata*



Site ID – CH 102

Area (ac) – 2.000

UTM – E 659184

N 3865173

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Ulmus americana, Acer rubrum, Liquidambar styraciflua*



Site ID – CH 103

Area (ac) – 0.440

UTM – E 659330

N 3865121

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Quercus phellos, Ulmus rubra, Lonicera japonica, Microstegium vimineum*



Site ID – CH 104

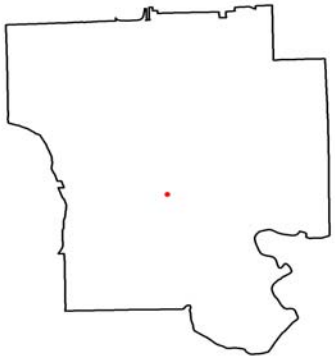
Area (ac) – 2.100

UTM – E 659296

N 3864901

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: *Microstegium vimineum, Acer rubrum, Liquidambar styraciflua*

Site ID – CH 105

Area (ac) – 0.530

UTM – E 659296

N 3864805

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: ***Liquidambar styraciflua, Microstegium vimineum, Ulmus americana***



Site ID – CH 106

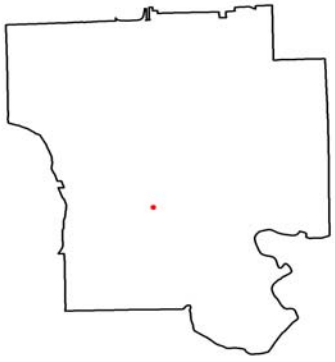
Area (ac) – 0.090

UTM – E 659072

N 3864657

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: *Quercus alba, Nyssa sylvatica, Chasmanthium laxum*



Site ID – CH 107

Area (ac) – 0.400

UTM – E 659035

N 3864421

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: ***Nyssa sylvatica, Microstegium vimineum, Ulmus americana, Ligustrum vulgare***



Site ID – CH 108

Area (ac) – 0.030

UTM – E 659319

N 3864490

Cowardin Class – PFO1C

HGM Class – Riverine



Dominant Species: *Scirpus atrovirens, Salix nigra, Chasmanthium latifolium, Celtis lavigata*



Site ID – CH 109

Area (ac) – 0.010

UTM – E 660007

N 3864696

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: *Vitis sp., Ulmus americana, Arisaema triphyllum*



Site ID – CH 110

Area (ac) – 0.010

UTM – E 660161

N 3864925

Cowardin Class – R4SB

HGM Class – Riverine



Dominant Species: ***Plantago cordata***



Site ID – CH 111

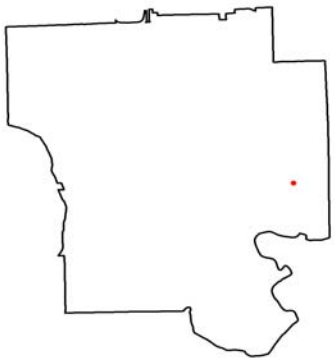
Area (ac) – 0.140

UTM – E 661263

N 3865110

Cowardin Class – PFO1A

HGM Class – Riverine



Dominant Species: ***Microstegium vimineum, Chasmanthium latifolium, Ulmus americana, Fraxinus pennsylvanica***



Site ID – CH 112

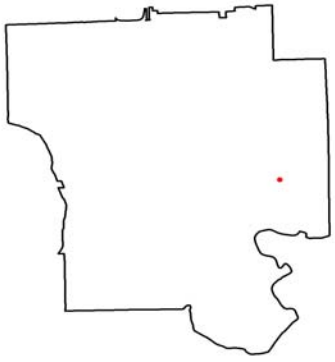
Area (ac) – 0.010

UTM – E 661056

N 38665141

Cowardin Class – R4SB

HGM Class – Riverine



Dominant Species: *Justica americana*



Site ID – CH 113

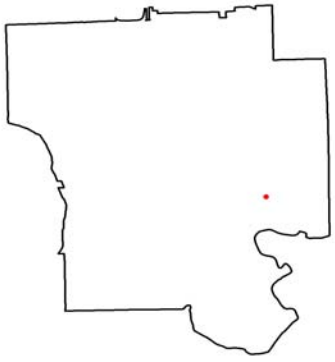
Area (ac) – 0.070

UTM – E 660833

N 3864844

Cowardin Class – R4SB

HGM Class – Riverine



Dominant Species: ***Plantago cordata***



Site ID – CH 114

Area (ac) – 0.030

UTM – E 660869

N 3866491

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: *Chasmanthium latifolium, Fraxinus pennsylvanica*



Site ID – CH 115

Area (ac) – 0.390

UTM – E 660697

N 3864931

Cowardin Class – PFO1A

HGM Class – Riverine



Dominant Species: ***Ulmus americana, Fraxinus pennsylvanica, Microstegium vimineum, Celtis lavigata***



Site ID – CH 116

Area (ac) – 0.020

UTM – E 660258

N 3864965

Cowardin Class – PFO1C

HGM Class – Slope



Dominant Species: *Ligustrum vulgare, Fraxinus pennsylvanica*



Site ID – CH 117

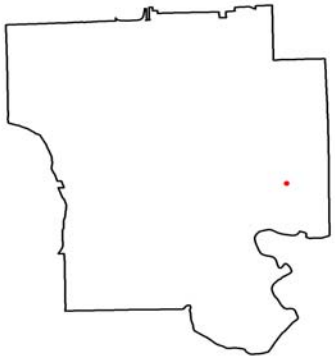
Area (ac) – 0.300

UTM – E 661143

N 3865074

Cowardin Class – PFO1A

HGM Class – Riverine



Dominant Species: *Celtis lavigata, Microstegium vimineum, Chasmanthium latifolium*



Site ID – CH 118

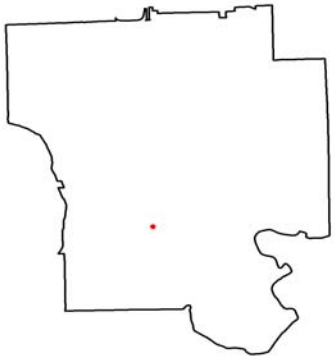
Area (ac) – 3.900

UTM – E 659075

N 3864311

Cowardin Class – PFO1C

HGM Class – Slope



Dominant Species: ***Fraxinus pennsylvanica, Toxicodendron radicans, Microstegium vimineum, Ulmus americana***



Site ID – CH 119

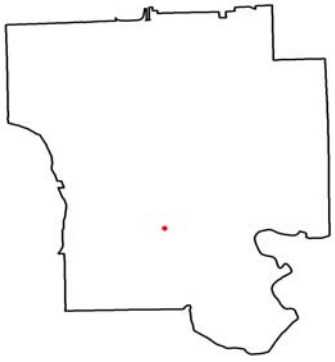
Area (ac) – 2.000

UTM – E 659258

N 3864277

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: ***Chasmanthium laxum, Acer rubrum, Toxicodendron radicans, Nyssa sylvatica***



Site ID – CH 120

Area (ac) – 0.460

UTM – E 659289

N 3863946

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: ***Microstegium vimineum, Fraxinus pennsylvanica, Chasmanthium laxum, Ulmus americana***



Site ID – CH 121

Area (ac) – 2.000

UTM – E 659386

N 3863823

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: *Fraxinus pennsylvanica, Celtis lavigata, Microstegium vimineum, Liquidambar styraciflua*



Site ID – CH 122

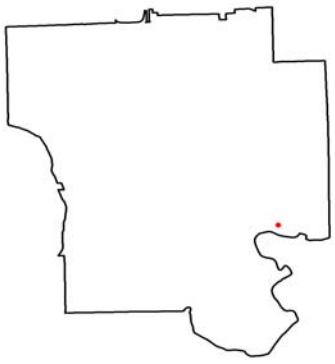
Area (ac) – 0.060

UTM – E 661026

N 3864373

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: *Celtis lavigata, Ulmus americana, Platanus occidentalis, Boehmeria cylindrica*



Site ID – CH 123

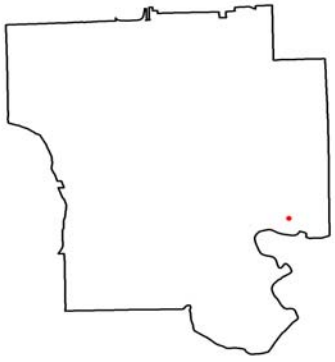
Area (ac) – 0.110

UTM – E 661191

N 3864447

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Ulmus rubra, Microstegium vimineum, Fraxinus pennsylvanica, Celtis lavigata***



Site ID – CH 124

Area (ac) – 0.680

UTM – E 660780

N 3863643

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: *Fraxinus pennsylvanica, Celtis lavigata, Platanus occidentalis, Boehmeria cylindrica*



Site ID – CH 125

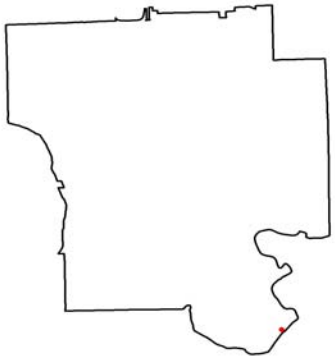
Area (ac) – 0.120

UTM – E 661067

N 3862465

Cowardin Class – PEM1C

HGM Class – Depression



Dominant Species: *Boehmeria cylindrica, Cyperus stigosus, Echinochloa crusgalli*



Site ID – CH 126

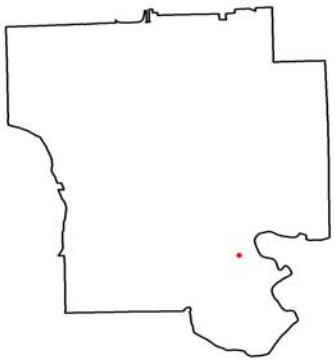
Area (ac) – 0.190

UTM – E 660413

N 3863840

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Microstegium vimineum, Chasmanthium laxum, Juniperus virginiana, Fraxinus pennsylvanica***



Site ID – CH 127

Area (ac) – 0.100

UTM – E 660227

N 3863257

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Microstegium vimineum, Ulmus rubra, Celtis lavigata*



Site ID – CH 128

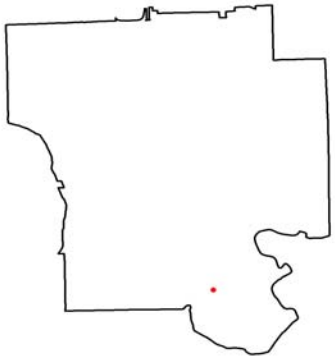
Area (ac) – 0.090

UTM – E 660023

N 3863186

Cowardin Class – PFO1C

HGM Class – Slope



Dominant Species: *Ulmus americana, Celtis lavigata*



Site ID – CH 129

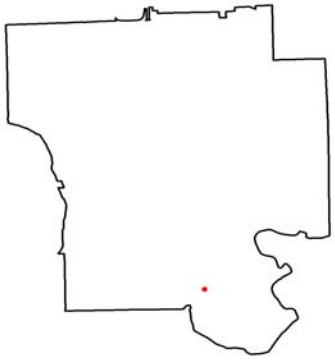
Area (ac) – 0.050

UTM – E 659875

N 3863188

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: *Chasmanthium laxum, Celtis lavigata, Carya cordiformis*



Site ID – CH 130

Area (ac) – 0.370

UTM – E 659639

N 3863208

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Microstegium vimineum, Ulmus americana, Acer saccharum*



Site ID – CH 131

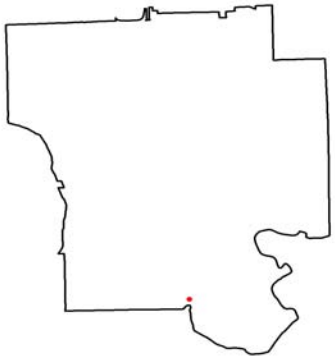
Area (ac) – 0.290

UTM – E 659642

N 3863015

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Ulmus americana, Celtis lavigata, Ligustrum vulgare, Fraxinus pennsylvanica***



Site ID – CH 132

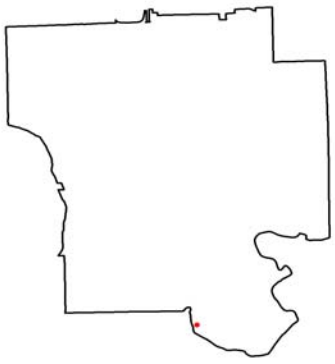
Area (ac) – 0.110

UTM – E 659759

N 3862595

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: ***Microstegium vimineum, Polygonum hydropiper, Acer rubrum, Quercus alba, Carpinus caroliniana***



Site ID – CH 133

Area (ac) – 0.150

UTM – E 659172

N 3863633

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Fraxinus pennsylvanica, Ligustrum vulgare, Toxicodendron radicans***



Site ID – CH 136

Area (ac) – 0.460

UTM – E 659254

N 3863620

Cowardin Class – PEM1A

HGM Class – Slope/Seep



Dominant Species: *Cyperus strigosus, Agrostis sp.*



Site ID – CH 137

Area (ac) – 0.090

UTM – E 658965

N 3863281

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: *Echniochloa crusgalli, Salix nigra, Fraxinus pennsylvanica*



Site ID – CH 138

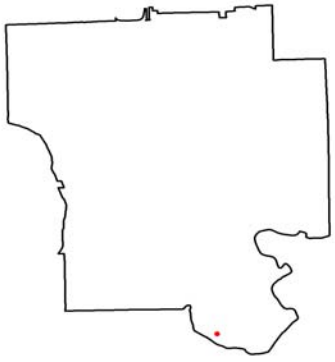
Area (ac) – 1.190

UTM – E 660063

N 3862405

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: ***Fraxinus pennsylvanica, Acer negundo, Boehmeria cylindrica, Acer rubrum***



Site ID – CH 139

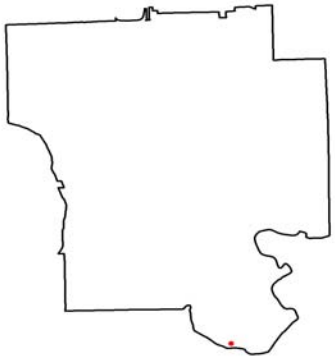
Area (ac) – 0.170

UTM – E 660280

N 3862229

Cowardin Class – PFO1C

HGM Class – Slope



Dominant Species: *Salix nigra, Boehmeria cylindrica, Fraxinus pennsylvanica*



Site ID – CH 140

Area (ac) – 0.010

UTM – E 660874

N 3862830

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: *Celtis lavigata, Fraxinus pennsylvanica*



Site ID – CH 141

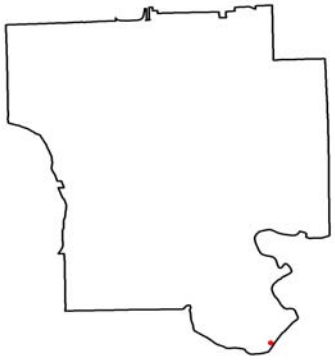
Area (ac) – 0.100

UTM – E 660893

N 3862252

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: *Microstegium vimineum, Fraxinus pennsylvanica, Platanus occidentalis*



Site ID – CH 142

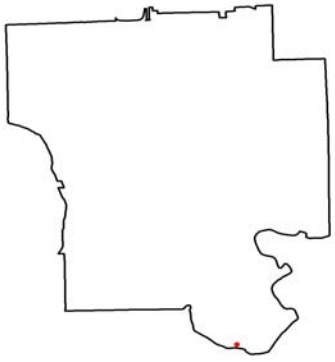
Area (ac) – 0.020

UTM – E 660381

N 3862210

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: ***Fraxinus pennsylvanica, Boehmeria cylindrica***



Site ID – CH 143

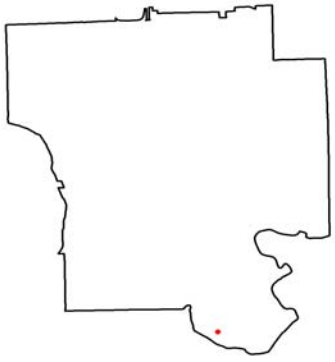
Area (ac) – 0.370

UTM – E 660082

N 3862446

Cowardin Class – PFO1A

HGM Class – Slope



Dominant Species: *Celtis lavigata, Platanus occidentalis, Acer rubrum, Microstegium vimineum*



Site ID – CH 144

Area (ac) – 0.090

UTM – E 660596

N 3862543

Cowardin Class – PEM1A

HGM Class – Slope



Dominant Species: *Cyperus strigosus, Dichanthelium claudestinum, Carex sp.*



Site ID – CH 145

Area (ac) – 0.010

UTM – E 651229

N 3874135

Cowardin Class – PEM1C

HGM Class – Slope/Seep



Dominant Species: ***Typha latifolia, Bidens frondosa***



Site ID – CH 146

Area (ac) – 9.330

UTM – E 649835

N 3876212

Cowardin Class – PFO1A

HGM Class – Riverine



Dominant Species: ***Platanus occidentalis, Acer saccharium, Liquidambar styraciflua, Chasmanthium latifolium***



Site ID – CH 147

Area (ac) – 0.090

UTM – E 647652

N 3869794

Cowardin Class – PFO1A

HGM Class – Slope/Seep



Dominant Species: *Arundinaria gigantea, Osmunda cinnamomea, Carpinus caroliniana*



Site ID – CH 148

Area (ac) – 0.070

UTM – E 647007

N 3870813

Cowardin Class – PEM1A

HGM Class – Riverine



Dominant Species: ***Boehmeria cylindrica, Polygonum sp., Pilea pumila, Chasmanthium latifolium***



Site ID – CH 149

Area (ac) – 0.100

UTM – E 646701

N 3870538

Cowardin Class – PFO1A

HGM Class – Riverine



Dominant Species: ***Acer saccharinum, Fraxinus pennsylvanica, Tovara sp., Pilea pumila***



Site ID – CH 150

Area (ac) – 0.060

UTM – E 647914

N 3872789

Cowardin Class – PFO1E

HGM Class – Riverine



Dominant Species: *Boehmeria cylindrica, Fraxinus pennsylvanica, Leersia oryzoides*



Site ID – CH 151

Area (ac) – 0.010

UTM – E 647905

N 3872831

Cowardin Class – PFO1C

HGM Class – Riverine



Dominant Species: *Boehmeria cylindrica, Microstegium vimineum, Fraxinus pennsylvanica*



Site ID – CH 152

Area (ac) – 0.740

UTM – E 648372

N 3873836

Cowardin Class – PFO1A

HGM Class – Riverine



Dominant Species: *Platanus occidentalis, Fraxinus pennsylvanica, Microstegium vimineum*



Site ID – CH 153

Area (ac) – 0.060

UTM – E 651742

N 3878805

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: *Pilea pumila, Ligustrum vulgare, Fraxinus pennsylvanica*

Site ID – CH 154

Area (ac) – 4.000

UTM – E 651747

N 3878928

Cowardin Class – PFO1A

HGM Class – Slope/Seep



Dominant Species: ***Fraxinus pennsylvanica, Liquidambar styraciflua, Ligustrum vulgare, Microstegium vimineum***



Site ID – CH 155

Area (ac) – 0.010

UTM – E 651423

N 3878933

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: *Liquidambar styraciflua, Campsis radicans, Ulmus rubra*



Site ID – CH 156

Area (ac) – 0.200

UTM – E 651341

N 3878926

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: ***Acer saccharinum, Fraxinus pennsylvanica, Juncus effusus***



Site ID – CH 157

Area (ac) – 0.200

UTM – E 651440

N 3878887

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: *Ligustrum vulgare, Liquidambar styraciflua, Ulmus rubra*



Site ID – CH 158

Area (ac) – 0.050

UTM – E 651197

N 3878894

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: ***Acer saccharinum, Celtis laevigata, Lycopus americana***



Site ID – CH 159

Area (ac) – 0.080

UTM – E 651056

N 3878788

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: *Liquidambar styraciflua, Ligustrum vulgare, Celtis laevigata, Panicum sp.*



Site ID – CH 160

Area (ac) – 0.040

UTM – E 651005

N 3878971

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: *Celtis laevigata, Liquidambar styraciflua, Quercus phellos*



Site ID – CH 161

Area (ac) – 0.020

UTM – E 650874

N 3878742

Cowardin Class – R4SB

HGM Class – Riverine



Dominant Species: *Chasmanthium latifolium, Platanus occidentalis, Fraxinus pennsylvanica*



Site ID – CH 162

Area (ac) – 0.240

UTM – E 651930

N 3878686

Cowardin Class – PEM1A

HGM Class – Depression



Dominant Species: ***Festuca arundinacea, Carex sp., Agrostis stolonifera***



Site ID – CH 163

Area (ac) – 0.060

UTM – E 651930

N 3878338

Cowardin Class – PEM1C

HGM Class – Slope



Dominant Species: *Lycopus americana, Fraxinus pennsylvanica, Acer rubrum, Salix nigra, Carex sp.*



Site ID – CH 164

Area (ac) – 2.130

UTM – E 651643

N 3878611

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: ***Fraxinus pennsylvanica, Lycopus americana, Carex sp., Echinochloa crusgalli, Cephalanthus occidentalis***



Site ID – CH 165

Area (ac) – 0.050

UTM – E 651271

N 3878516

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: ***Acer saccharinum, Ligustrum vulgare, Liquidambar styraciflua***



Site ID – CH 166

Area (ac) – 0.100

UTM – E 651721

N 3878188

Cowardin Class – PFO1A

HGM Class – Flat



Dominant Species: *Quercus phellos*, *Betula nigra*



Site ID – CH 167

Area (ac) – 2.540

UTM – E 651651

N 3877921

Cowardin Class – PEM1C

HGM Class – Depression



Dominant Species: *Juncus effusus, Pluchea odorata*



Site ID – CH 168

Area (ac) – 0.590

UTM – E 651578

N 3877861

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: *Salix nigra, Pluchea odorata, Microstegium vimineum*



Site ID – CH 169

Area (ac) – 0.060

UTM – E 651962

N 3878711

Cowardin Class – PEM1C

HGM Class – Slope



Dominant Species: *Polygonum hydropiper, Carex sp., Pluchea camphorata*



Site ID – CH 170

Area (ac) – 0.010

UTM – E 651950

N 3878662

Cowardin Class – PEM1C

HGM Class – Depression



Dominant Species: *Liquidambar styraciflua, Carex intumescens, Agrostis stolonifera*



Site ID – CH 171

Area (ac) – 1.480

UTM – E 652309

N 3878174

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: ***Liquidambar styraciflua, Juncus effusus, Rubus sp., Typha latifolia***



Site ID – CH 172

Area (ac) – 0.270

UTM – E 651187

N 3878146

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: ***Acer saccharinum, Fraxinus pennsylvanica, Acer rubrum, Dulichium arundinaceum***



Site ID – CH 173

Area (ac) – 0.060

UTM – E 651202

N 3878051

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: ***Acer saccharinum, Fraxinus pennsylvanica, Smilax sp., Panicum sp.***



Site ID – CH 174

Area (ac) – 0.056

UTM – E 651199

N 3878003

Cowardin Class – PEM1C

HGM Class – Depression



Dominant Species: *Juncus effusus, Agrostis stolonifera, Carex gigantea, Polygonum sp.*



Site ID – CH 175

Area (ac) – 0.910

UTM – E 651191

N 3877955

Cowardin Class – PFO1C

HGM Class – Depression



Dominant Species: ***Acer saccharinum, Celtis laevigata, Acer rubrum, Pluchea camphorata, Carex intumescens***



Site ID – CH 176

Area (ac) – 3.600

UTM – E 651859

N 3881028

Cowardin Class – PEM1E

HGM Class – Depression

Dominant Species: *Typha latifolia, Panicum sp., Cephalanthus occidentalis*





Site ID – CH 177

Area (ac) – 0.500

UTM – E 651928

N 3880708

Cowardin Class – PFO1C

HGM Class – Depression

Dominant Species: *Fraxinus pennsylvanica, Liquidambar styraciflua*





Site ID – CH 178

Area (ac) – 0.020

UTM – E 651963

N 3880439

Cowardin Class – PFO1A

HGM Class – Depression



Dominant Species: ***Acer saccharinum, Liquidambar styraciflua, Ligustrum vulgare***



Site ID – CH 179

Area (ac) – 0.120

UTM – E 651542

N 3880699

Cowardin Class – PFO1C

HGM Class – Depression

Dominant Species: *Salix nigra, Agrostis stolonifera*





Site ID – CH 180

Area (ac) – 6.650

UTM – E 651580

N 3880804

Cowardin Class – PFO1A

HGM Class – Slope

Dominant Species: *Fraxinus pennsylvanica, Acer rubrum, Agrostis stolonifera*





Site ID – CH 181

Area (ac) – 6.230

UTM – E 649486

N 3877243

Cowardin Class – PFO1C

HGM Class – Slope

Dominant Species: ***Acer rubrum, Nyssa sylvatica, Fraxinus pennsylvanica, Platanus occidentalis***



APPENDIX B

Database Table

SITE ID	UTM East	UTM North	Acreage	HGM Class	Cowardin Class	Surface Water Storage	Ground Water Discharge (to streams)	Carbon Nutrient Export	Provide Wildlife Habitat	Support Wetland Plants	Cultural Values	Research / Scientific	Economic Value	Exotics Present
CH1	659360	3867998	0.190	Depression	PFO1A	High	N/A	Low	Low	Low	Yes - Adjacent to road	No	No	No
CH2	658460	3867501	0.220	Depression	PFO1C	High	Low	Low	High	Low	Yes - Adjacent to trail	Yes - Herpetological Research	No	Yes - Privet and Japanese honeysuckle
CH3	657380	3866826	0.050	Slope	PFO1A	Low	Low	High	Low	Low	No	No	No	No
CH4	657310	3866788	0.130	Slope	PFO1A	Low	Low	High	Low	Low	Yes - Adjacent to trail	No	No	No
CH5	657007	3867421	0.070	Slope	PFO1A	Low	Low	High	Low	Low	No	No	No	Yes - Privet
CH6	657823	3867072	0.020	Slope	PFO1A	Low	High	High	High	Medium	No	No	No	Yes - Privet and Japanese honeysuckle
CH7	659081	3866423	0.110	Slope	PEM1A	N/A	N/A	Low	Low	Medium	Yes - Adjacent to trail and battlefield	Yes - Potential restoration site	No	Yes - Fescue
CH8	659050	3866346	1.800	Depression	PFO1C	High	N/A	Low	High	Low	Yes - Adjacent to road	Yes - Larger than average size, Herp. Res	Yes	Yes - Japan grass
CH9	658586	3863908	0.050	Slope	PEM1A	N/A	N/A	N/A	Low	Low	No	No	No	Yes - Fescue
CH10	658178	3867552	0.004	Slope	PFO1A	N/A	Low	High	Low	Low	Yes - Adjacent to trail	No	No	Yes - Privet
CH11	658788	3866438	6.900	Flat	PFO1A	Low	N/A	Low	Medium	Low	Yes - Adjacent to trail	Yes - Larger than average size	No	Yes - Privet and Japanese honeysuckle
CH12	658606	3867458	0.010	Depression	PEM1C	High	N/A	N/A	High	Medium	Yes - Adjacent to road	No	No	Yes - Fescue
CH13	657781	3866581	0.120	Slope	PFO1A	N/A	Low	High	Low	Low	Yes - Adjacent to trail	No	No	No
CH14	658481	3866310	0.100	Depression	PFO1C	High	N/A	N/A	High	High	Yes - Adjacent to trail	Yes - Herpetological Research	No	Yes - Japanese honeysuckle
CH15	658640	3866488	0.030	Depression	PFO1C	High	N/A	Low	Medium	Medium	Yes - Adjacent to trail	No	No	No
CH16	658849	3866470	0.420	Flat	PEM1A	N/A	N/A	N/A	Low	Low	Yes - Adjacent to trail	No	No	Yes - Fescue
CH17	658903	3866264	0.060	Depression	PFO1C	High	N/A	N/A	Medium	Medium	No	Yes - Herpetological Research	No	Yes - Japanese honeysuckle
CH18	658467	3866519	0.050	Depression	PSS1C	High	N/A	N/A	Medium	Medium	No	No	No	Yes - Privet
CH19	658617	3866161	0.490	Depression	PFO1E	High	N/A	Low	High	High	No	Yes - Larger than average size	No	Yes - Privet
CH20	658685	3866148	0.300	Flat	PFO1A	Low	N/A	Low	Medium	Low	No	Yes - Larger than average size	No	Yes - Japan grass
CH21	658488	3865476	0.020	Depression	PFO1C	High	N/A	N/A	Medium	Low	Yes - Adjacent to trail	Yes - Herpetological Research	No	Yes - Japanese honeysuckle
CH22	658485	3865433	0.020	Depression	PFO1C	High	N/A	N/A	Medium	Low	Yes - Adjacent to road	Yes - Herpetological Research	No	Yes - Privet and Japanese honeysuckle
CH23	658280	3865239	0.020	Depression	PEM1A	High	N/A	N/A	Low	Low	No	No	No	Yes - Fescue
CH24	658321	3865531	0.330	Slope	PFO1A	N/A	Low	High	Low	Low	No	No	No	Yes - Privet
CH25	658346	3865688	2.600	Slope	PEM1C	N/A	High	Low	Medium	High	Yes - Adjacent to road	Yes - Larger than average size, Herp. Res	No	Yes - Fescue
CH26	658413	3865974	2.600	Flat	PFO1A	Low	Low	Medium	Medium	Medium	No	Yes - Larger than average size, Herp. Res	No	Yes - Japan grass, Privet and Japenses honeysuckle
CH27	657607	3865539	0.060	Depression	PEM1A	High	N/A	N/A	Low	High	No	No	No	Yes - Lespedeza
CH29	658404	3864505	0.200	Depression	PEM1F	High	N/A	N/A	High	High	Yes - Adjacent to trail	Yes - Herpetological Research	No	Yes - Privet and Japanese honeysuckle
CH30	658592	3864319	0.300	Depression	PFO1A	High	N/A	N/A	High	Medium	No	Yes - Larger than average size	No	Yes - Privet and Japanese honeysuckle

SITE ID	UTM East	UTM North	Acreage	HGM Class	Cowardin Class	Surface Water Storage	Ground Water Discharge (to streams)	Carbon Nutrient Export	Provide Wildlife Habitat	Support Wetland Plants	Cultural Values	Research / Scientific	Economic Value	Exotics Present
CH31	658764	3864225	0.080	Riverine	PEM1C	Low	Low	High	High	High	Yes - Adjacent to road	Yes - Herpetological Research	No	Yes - Privet
CH32	658232	3865212	0.120	Riverine	PSS1C	High	Low	Medium	High	High	Yes - Adjacent to road	Yes - Herpetological Research	Yes - Cumulative flood attenuation	Yes - Fescue
CH33	658294	3864029	0.150	Depression	PFO1A	High	N/A	N/A	Low	Low	No	No	No	Yes - Privet
CH34	658140	3864013	0.250	Slope	PFO1A	Low	High	High	Low	Low	No	No	No	Yes - Privet
CH35	657879	3863805	0.060	Depression	PSS1C	High	N/A	N/A	High	Medium	No	Yes - Herpetological Research	No	Yes - Japan grass
CH36	657748	3863103	157.240	Slope	PFO1A	N/A	N/A	Low	Medium	Medium	Yes - Adjacent to road	Yes - Larger than average size	No	Yes - Privet
CH36B	657728	3862815		Slope	PFO1A	N/A	N/A	Low	Medium	Medium	No	Yes - Larger than average size	Yes - Cumulative flood attenuation	Yes - Privet
CH36C	658169	3863097		Slope	PSS1E	High	Low	High	High	High	No	Yes - Larger than average size	Yes - Cumulative flood attenuation	Yes - Privet
CH36D	657893	3863676		Slope	PFO1A	High	N/A	N/A	High	Medium	No	Yes - Larger than average size	No	Yes - Privet
CH36E	658941	3863482		Slope	PFO1C	High	Low	Low	High	Medium	Yes - Adjacent to road	Yes - Herpetological Research	No	Yes - Privet
CH36F	658884	3863471		Slope	PEM1A	High	N/A	Low	Low	Low	No	No	No	Yes - Privet
CH36G	659201	3863526		Slope	PFO1E	Low	High	High	High	Medium	No	Yes - Herpetological Research	Yes - Cumulative flood attenuation	Yes - Privet
CH36H	659408	3863294		Slope	PFO1E	High	N/A	Low	High	High	No	No	Yes - Cumulative flood attenuation	Yes - Privet
CH40	658271	3863664	2.920	Flat	PFO1C	N/A	N/A	Low	High	Low	No	Yes - Larger than average size, Herp. Res	No	Yes - Japan grass
CH41	660130	3867951	0.280	Flat	PFO1A	N/A	N/A	Low	Low	Low	No	No	No	Yes - Privet
CH42	661663	3866563	0.060	Riverine	R4SB	High	N/A	Medium	High	High	Yes - Adjacent to trail	No	Yes - Cumulative flood attenuation	Yes - Fescue
CH43	661701	3866535	0.040	Riverine	R4SB	High	N/A	High	High	High	Yes - Adjacent to trail	Yes - Herpetological Research	Yes - Cumulative flood attenuation	Yes - Fescue
CH44	661397	3866776	0.005	Depression	PFO1C	Low	High	High	High	Low	No	No	No	Yes - Japanese honeysuckle
CH45	660822	3867184	0.170	Flat	PEM1A	N/A	Low	Low	Medium	High	No	Yes - Unique habitat (glade)	No	No
CH46	660448	3867974	0.680	Slope	PFO1A	Low	High	High	Medium	Low	No	Yes - Larger than average size	No	Yes - Japan grass and Privet
CH47	661503	3867277	0.040	Slope	PFO1C	N/A	Low	High	High	Medium	No	Yes - Herpetological Research	No	Yes - Privet
CH48	660034	3867851	0.020	Depression	PFO1A	High	N/A	Low	Medium	Low	No	No	No	Yes - Privet
CH49	660136	3867696	0.130	Depression	PFO1E	High	N/A	Low	High	Medium	No	Yes - Herpetological Studies	No	Yes - Privet
CH50	660108	3867735	0.130	Flat	PFO1A	N/A	N/A	Low	Low	Low	No	No	No	Yes - Privet
CH51	660045	3867655	3.400	Slope	PFO1C	N/A	N/A	Medium	High	Medium	No	Yes - Larger than average size, Herp. Studies	No	Yes - Privet
CH52	659999	3867544	6.300	Flat	PFO1A	Low	N/A	Low	Medium	Medium	No	Yes - Larger than average size	No	Yes - Privet
CH53	659545	3867891	0.280	Slope	PFO1A	N/A	Low	High	Medium	Medium	No	Yes - Larger than average size	No	Yes - Privet

SITE ID	UTM East	UTM North	Acreage	HGM Class	Cowardin Class	Surface Water Storage	Ground Water Discharge (to streams)	Carbon Nutrient Export	Provide Wildlife Habitat	Support Wetland Plants	Cultural Values	Research / Scientific	Economic Value	Exotics Present
CH54	659530	3867837	0.001	Depression	PFO1C	Low	N/A	N/A	High	Low	No	No	No	Yes - Privet and Japanese honeysuckle
CH55	659359	3867969	0.020	Slope	PFO1A	Low	Low	High	High	Low	No	No	No	Yes - Privet
CH56	659358	3867740	0.050	Flat	PFO1A	N/A	N/A	Low	Low	Low	Yes - Adjacent to trail	Yes - Larger than average size	No	Yes - Privet and Japanese honeysuckle
CH57	659353	3867931	0.500	Slope	PFO1A	N/A	N/A	Low	Medium	Low	No	Yes - Larger than average size	No	Yes - Privet
CH58	659579	3867739	0.100	Slope	PFO1A	N/A	N/A	Medium	Medium	Low	No	No	No	Yes - Japanese honeysuckle
CH59	659101	3867165	0.250	Slope	PFO1A	N/A	High	High	Low	Low	No	No	No	Yes - Privet
CH60	659251	3867213	0.220	Slope	PFO1A	N/A	High	High	Low	Low	No	No	No	Yes - Privet
CH61	659254	3866990	0.590	Slope	PFO1A	N/A	Medium	Medium	Low	Low	No	Yes - Larger than average size	No	Yes - Privet and Japan grass
CH62	659850	3867875	0.230	Depression	PFO1A	High	N/A	Low	Medium	Low	No	No	No	Yes - Privet
CH64	659831	3867645	0.300	Slope	PFO1A	Low	N/A	Low	Low	Low	No	No	No	Yes - Privet
CH65	659788	3867433	0.020	Depression	PFO1A	High	N/A	Low	Medium	Low	No	Yes - Herpetological Research	No	Yes - Privet and Japan grass
CH66	659893	3867380	2.410	Slope	PFO1A	Low	High	Medium	Medium	Low	No	Yes - Larger than average size	No	Yes - Privet
CH67	659890	3867133	0.500	Slope	PFO1A	Low	N/A	Low	Low	Low	No	No	No	Yes - Privet
CH68	659570	3867339	1.000	Slope	PFO1A	Low	Medium	Medium	Low	Low	No	Yes - Larger than average size	No	Yes - Japan grass
CH69	659171	3867371	0.200	Slope	PFO1A	N/A	Low	Medium	Low	Low	No	No	No	Yes - Privet
CH70	659281	3867266	0.160	Slope	PFO1A	N/A	Medium	Medium	Medium	Low	No	No	No	Yes - Privet
CH71	659722	3866300	0.010	Depression	PFO1C	High	N/A	N/A	High	Low	No	Yes - Herpetological Research	No	Yes - Japan grass
CH72	659430	3865981	0.520	Depression	PFO1A	High	N/A	N/A	Low	Low	No	No	No	Yes - Privet
CH73	659434	3865731	0.020	Flat	PFO1C	Low	N/A	Low	Medium	Low	No	No	No	No
CH74	659354	3866339	0.020	Slope	PFO1C	N/A	High	High	Medium	Low	Yes - Adjacent to trail	Yes - Herpetological Research	No	Yes - Privet
CH75	659532	3867078	0.040	Slope	PFO1C	N/A	High	High	Medium	Low	Yes - Adjacent to trail	No	No	Yes - Privet and Japan grass
CH76	659526	3866839	0.090	Slope	PFO1A	N/A	High	High	Low	Low	No	No	No	Yes - Privet and Japanese honeysuckle
CH77	659547	3866782	0.030	Slope	PFO1A	N/A	High	High	Low	Low	No	No	No	Yes - Privet and Japan grass
CH78	659826	3866952	0.020	Slope	PFO1A	N/A	Medium	Medium	Low	Low	No	No	No	Yes - Privet
CH79	659790	3867013	0.370	Slope	PFO1C	N/A	High	High	High	Low	No	Yes - Herpetological Research	No	Yes - Privet
CH80	659898	3866523	0.520	Slope	PFO1A	N/A	N/A	Low	Low	Low	No	No	No	Yes - Privet and Japanese honeysuckle
CH81	659955	3866924	0.020	Depression	PFO1C	High	N/A	N/A	High	Low	No	Yes - Herpetological Research	No	Yes - Privet and Japan grass
CH82	660565	3866467	0.030	Riverine	R4SB	Low	N/A	High	High	High	Yes - Adjacent to trail	Yes - Site dominated by uncommon plant	No	Yes - Privet
CH83	661178	3866791	0.010	Riverine	R4SB	Low	N/A	High	High	High	No	Yes - Site dominated by uncommon plant	No	Yes - Privet
CH84	660997	3866936	0.010	Riverine	R4SB	Low	N/A	High	High	High	No	Yes - Site dominated by uncommon plant	No	Yes - Privet

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CH85	660956	3866989	0.020	Riverine	R4SB	Low	N/A	High	High	High	No	Yes - Site dominated by uncommon plant	No	Yes - Privet
CH86	660561	3866431	0.010	Riverine	R4SB	Low	N/A	High	High	High	No	Yes - Site dominated by uncommon plant	No	Yes - Privet
CH87	661719	3866553	0.010	Riverine	R4SB	Low	N/A	High	High	High	No	Yes - Site dominated by uncommon plant	No	Yes - Privet
CH88	661729	3865503	7.900	Slope	PFO1C	Low	N/A	Low	High	Low	No	Yes - Larger than average size, Herp. Res	No	Yes - Privet and Japanese honeysuckle
CH89	661574	3865440	1.500	Flat	PFO1C	N/A	N/A	Low	Medium	Low	No	Yes - Herpetological Research	No	Yes - Privet
CH90	661548	3865163	6.200	Flat	PFO1A	N/A	N/A	Low	Medium	Medium	No	Yes - Larger than average size	No	Yes - Privet
CH91	661650	3864558	2.200	Depression	PFO1C	High	N/A	N/A	High	High	No	Yes - Larger than average size, Herp. Res	No	No
CH92	661084	3865854	0.030	Riverine	R4SB	N/A	Medium	High	High	High	No	Yes - Site dominated by uncommon plant	No	Yes - Japan grass
CH93	660852	3866165	0.060	Riverine (Depression)	PFO1A	High	High	High	High	Low	No	No	No	Yes - Privet
CH94	659031	3866071	2.700	Slope	PFO1A	Low	N/A	Low	Medium	Low	Yes - Adjacent to road	Yes - Larger than average size	No	Yes - Japan grass
CH97	659318	3865414	0.030	Slope	PFO1C	Low	High	High	High	Medium	No	Yes - Herpetological Research	No	Yes - Privet
CH98	659448	3865938	0.070	Flat	PFO1A	N/A	N/A	Low	Low	Low	No	No	No	Yes - Privet
CH99	659690	3865593	0.100	Riverine	R4SB	Low	N/A	High	High	High	No	Yes - Site dominated by uncommon plant	No	Yes - Privet
CH100	659454	3865276	0.010	Riverine	R4SB	Low	N/A	High	High	High	No	Yes - Site dominated by uncommon plant	No	Yes - Privet
CH101	659769	3865350	0.010	Riverine	R4SB	Low	N/A	High	High	High	No	Yes - Site dominated by uncommon plant	No	Yes - Privet
CH102	659184	3865173	2.000	Slope	PFO1A	N/A	N/A	Low	Low	Low	Yes - Adjacent to trail	Yes - Larger than average size	No	Yes - Privet and Japan grass
CH103	659330	3865121	0.440	Slope	PFO1A	N/A	N/A	Low	Low	Low	No	No	No	Yes - Japanese honeysuckle and Japan grass
CH104	659296	3864901	2.100	Flat	PFO1A	Low	N/A	N/A	Medium	Low	No	Yes - Larger than average size	No	Yes - Privet
CH105	659296	3864805	0.530	Flat	PFO1A	N/A	N/A	N/A	Medium	Low	No	No	No	Yes - Privet and Japan grass
CH106	659072	3864657	0.090	Flat	PFO1A	N/A	N/A	Low	Medium	Low	No	No	No	Yes - Privet
CH107	659035	3864421	0.400	Flat	PFO1A	N/A	N/A	N/A	Medium	Low	Yes - Adjacent to trail	No	No	Yes - Privet and Japan grass
CH108	659319	3864490	0.030	Riverine	PFO1C	High	Low	High	High	High	Yes - Adjacent to trail	Yes - Herpetological Research	No	Yes - Privet
CH109	660007	3864696	0.010	Depression	PFO1A	High	High	Medium	Medium	Low	No	No	No	Yes - Privet

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CH110	660161	3864925	0.010	Riverine	R4SB	High	N/A	High	High	High	Yes - Adjacent to trail	Yes - Site dominated by uncommon plant	No	No
CH111	661263	3865110	0.140	Riverine	PFO1A	N/A	High	High	Medium	Low	No	No	Yes - Within floodplain of stream, flood attenuation	Yes - Japan grass
CH112	661056	3865141	0.010	Riverine	R4SB	High	N/A	High	High	High	No	No	No	No
CH113	660833	3864844	0.070	Riverine	R4SB	High	N/A	High	High	High	No	Yes - Site dominated by uncommon plant	No	Yes - Privet
CH114	660869	3866491	0.030	Depression	PFO1A	High	Low	Low	Medium	Low	No	No	Yes - Depression in fllodplain, flood attenuation	Yes - Privet
CH115	660697	3864931	0.390	Riverine	PFO1A	N/A	Low	Low	Medium	Low	No	No	Yes - Flood attenuation	Yes - Privet and Japan grass
CH116	660258	3864965	0.020	Slope	PFO1C	N/A	Low	Low	High	Low	No	Yes - Herpetological Research	No	Yes - Privet
CH117	661143	3865074	0.300	Riverine	PFO1A	Low	Medium	High	Medium	Low	No	No	Yes - Flood attenuation	Yes - Privet and Japan grass
CH118	659075	3864311	3.900	Slope	PFO1C	N/A	N/A	Low	High	Medium	Yes - Adjacent to trail	Yes - Research	No	Yes - Japan grass
CH119	659258	3864277	2.000	Flat	PFO1A	N/A	Low	Low	Medium	Low	No	Yes - Larger than average size	No	Yes - Privet
CH120	659289	3863946	0.460	Flat	PFO1A	Low	N/A	N/A	Low	Medium	No	No	No	Yes - Japan grass
CH121	659386	3863823	2.000	Flat	PFO1A	N/A	N/A	N/A	Medium	Medium	No	Yes - Larger than average size	No	Yes - Privet and Japan grass
CH122	661026	3864373	0.060	Depression	PFO1C	High	N/A	N/A	High	Medium	No	Yes - Herpetological Research	No	Yes - Privet
CH123	661191	3864447	0.110	Slope	PFO1A	N/A	High	High	Medium	Medium	No	No	No	Yes - Privet and Japan grass
CH124	660780	3863643	0.680	Depression	PFO1C	High	Low	High	High	Medium	No	Yes - Larger than average size	Yes - Within floodplain of stream, flood attenuation	No
CH125	661067	3862465	0.120	Depression	PEM1C	High	N/A	N/A	High	High	No	Yes - Larger than average size, Herp. Res	No	Yes - Barnyard grass
CH126	660413	3863840	0.190	Slope	PFO1A	N/A	High	High	Low	Low	No	No	No	Yes - Japan grass
CH127	660227	3863257	0.100	Slope	PFO1A	N/A	High	High	Medium	Low	No	No	No	Yes - Privet and Japan grass
CH128	660023	3863186	0.090	Slope	PFO1C	Low	High	High	High	Medium	No	No	No	Yes - Privet
CH129	659875	3863188	0.050	Flat	PFO1A	N/A	N/A	Low	Medium	Low	No	No	No	Yes - Privet
CH130	659639	3863208	0.370	Slope	PFO1A	N/A	N/A	Low	Low	Low	No	No	No	Yes - Privet and Japan grass
CH131	659642	3863015	0.290	Slope	PFO1A	N/A	N/A	Low	Low	Medium	No	No	No	Yes - Privet
CH132	659759	3862595	0.110	Depression	PFO1C	High	N/A	Low	Medium	Low	No	Yes - Herpetological Research	Yes - Depression in fllodplain, flood attenuation	Yes - Japan grass
CH133	659172	3863633	0.150	Slope	PFO1A	N/A	High	High	Medium	Low	No	No	No	Yes - Privet
CH136	659254	3863620	0.460	Slope/Seep	PEM1A	N/A	N/A	Low	Low	Medium	Yes - Adjacent to road	No	No	No
CH137	658965	3863281	0.090	Depression	PFO1A	High	N/A	Low	High	High	Yes - Adjacent to trail	No	No	Yes - Barnyard grass
CH138	660063	3862405	1.190	Slope	PFO1A	Low	Low	Medium	Medium	Medium	No	Yes - Larger than average size	No	Yes - Privet and Japan grass
CH139	660280	3862229	0.170	Slope	PFO1C	N/A	High	High	Medium	High	No	Yes - Herpetological Research	No	No

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CH140	660874	3862830	0.010	Depression	PFO1A	High	Low	Low	Medium	Medium	No	No	No	Yes - Privet and Japan grass
CH141	660893	3862252	0.100	Depression	PFO1A	High	N/A	Low	Medium	Low	No	No	Yes - Depression in fllodplain, flood attenuation	Yes - Japan grass
CH142	660381	3862210	0.020	Depression	PFO1A	High	Low	Low	Low	Low	No	No	No	Yes - Privet and Japan grass
CH143	660082	3862446	0.370	Slope	PFO1A	N/A	High	High	Low	Low	Yes - Adjacent to trail	No	No	Yes - Privet and Japan grass
CH144	660596	3862543	0.090	Slope	PEM1A	N/A	N/A	N/A	Low	Medium	No	Yes - Unique habitat (glade)	No	No
CH145	651229	3874135	0.010	Slope/Seep	PEM1C	N/A	N/A	Low	Medium	High	Yes - Adjacent to road	Yes - Herpetological Research	No	Yes - Kudzu
CH146	649835	3876212	9.330	Riverine	PFO1A	High	High	High	High	Medium	No	Yes - Larger than average size	Yes - Flood attenuation	Yes - Privet
CH147	647652	3869794	0.090	Slope/Seep	PFO1A	Low	High	High	High	Medium	Yes	No	No	Yes - Japan grass
CH148	647007	3870813	0.070	Riverine	PEM1A	High	Medium	High	High	Medium	No	No	Yes - Flood attenuation	Yes - Dayflower
CH149	646701	3870538	0.100	Riverine	PFO1A	Low	High	Medium	Medium	Medium	Yes - Adjacent to trail	No	Yes - Flood attenuation	Yes - Privet and Japan grass
CH150	647914	3872789	0.060	Riverine	PFO1E	High	High	High	High	High	No	No	Yes - Flood attenuation	No
CH151	647905	3872831	0.010	Riverine	PFO1C	High	High	High	High	Medium	No	No	Yes - Flood attenuation	Yes - Japan grass
CH152	648372	3873836	0.740	Riverine	PFO1A	High	High	High	Medium	Medium	No	Yes - Larger than average size	Yes - Flood attenuation	Yes - Privet and Japan grass
CH153	651742	3878805	0.060	Depression	PFO1A	High	Low	Low	Medium	Low	Yes - Adjacent to trail	No	No	Yes - Privet
CH154	651747	3878928	4.000	Slope/Seep	PFO1A	Low	High	High	Medium	Medium	No	No	No	Yes - Privet and Japan grass
CH155	651423	3878933	0.010	Depression	PFO1A	High	N/A	N/A	Medium	Low	Yes - Adjacent to trail	No	No	Yes - Japanese honeysuckle
CH156	651341	3878926	0.200	Depression	PFO1C	High	N/A	Low	High	Medium	No	No	No	No
CH157	651440	3878887	0.200	Flat	PFO1A	N/A	N/A	N/A	Low	Low	No	No	No	Yes - Privet, Japanese honeysuckle and Japan grass
CH158	651197	3878894	0.050	Depression	PFO1A	High	High	High	Medium	No	No	No	No	No
CH159	651056	3878788	0.080	Depression	PFO1A	High	N/A	Medium	High	Low	No	No	No	Yes - Privet
CH160	651005	3878971	0.040	Depression	PFO1A	High	N/A	Low	Medium	Low	No	No	No	Yes - Privet
CH161	650874	3878742	0.020	Riverine	R	High	High	High	High	Low	No	No	Yes - Cumulative flood attenuation	Yes - Privet
CH162	651930	3878686	0.240	Depression	PEM1A	High	N/A	N/A	Low	Low	Yes - Adjacent to road	No	No	Yes - Fescue
CH163	651894	3878338	0.060	Slope	PEM1C	Low	N/A	Low	Medium	Medium	Yes - Adjacent to road	No	No	Yes - Privet and Japanese honeysuckle
CH164	651643	3878611	2.130	Depression	PFO1A	High	Low	Low	High	Medium	No	Yes - Herpetological Research	Yes - Cumulative flood attenuation	No
CH165	651271	3878516	0.050	Depression	PFO1A	High	N/A	Low	Medium	Low	Yes - Adjacent to road	Yes - Larger than average size	No	Yes - Privet
CH166	651721	3878188	0.100	Flat	PFO1A	N/A	N/A	N/A	Low	Low	No	No	No	No
CH167	651651	3877921	2.540	Depression	PEM1C	High	N/A	Low	High	High	No	Yes - Herpetological Research	No	No
CH168	651578	3877861	0.590	Depression	PFO1C	High	N/A	Low	High	High	No	Yes - Herpetological Research	No	Yes - Japan grass
CH169	651962	3878711	0.060	Slope	PEM1C	High	N/A	Low	High	Medium	Yes - Adjacent to road	Yes - Herpetological Research	No	Yes - Privet and Japanese honeysuckle

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CH170	651950	3878662	0.010	Depression	PEM1C	High	N/A	N/A	High	Medium	Yes - Adjacent to road	Yes - Herpetological Research	No	Yes - Privet and Japanese honeysuckle
CH171	652309	3878174	1.480	Depression	PFO1A	Low	High	Low	Medium	Medium	Yes - Adjacent to trail	Yes - Herpetological Research	Yes - Cumulative flood attenuation	Yes - Japanese honeysuckle and Fescue
CH172	651187	3878146	0.270	Depression	PFO1C	High	N/A	N/A	High	Medium	No	Yes - Herpetological Research	No	Yes - Privet
CH173	651202	3878051	0.060	Depression	PFO1A	High	N/A	Low	Medium	Medium	No	Yes - Herpetological Research	No	Yes - Privet
CH174	651199	3878003	0.056	Depression	PEM1C	High	N/A	Low	High	High	Yes - Adjacent to road	Yes - Herpetological Research	No	Yes - Fescue
CH175	651191	3877955	0.910	Depression	PFO1C	High	N/A	Low	High	Medium	No	Yes - Larger than average size, Herp. Res	No	Yes - Privet
CH176	651859	3881028	3.600	Depression	PEM1E	High	High	High	High	High	No	Yes - Larger than average size, Herp. Res	No	No
CH177	651928	3880708	0.500	Depression	PFO1C	High	N/A	N/A	High	Low	No	Yes - Herpetological Research	No	Yes - Privet
CH178	651963	3880439	0.020	Depression	PFO1A	High	N/A	N/A	Medium	Medium	No	No	No	Yes - Privet
CH179	651542	3880699	0.120	Depression	PFO1C	High	Medium	Medium	High	High	No	Yes - Herpetological Research	No	Yes - Privet
CH180	651580	3880804	6.650	Slope	PFO1A	High	Medium	Medium	High	High	No	Yes - Larger than average size, Herp. Res	Yes - Cumulative flood attenuation	Yes - Privet
CH181	649486	3877243	6.230	Slope	PFO1C	High	Low	Medium	High	High	No	Yes - Larger than average size, Herp. Res	Yes - Close to river, cumulative flood attenuation	Yes - Privet

APPENDIX C

Plant species and Indicator status

Scientific Name	Common Name	Indicator Status
Acer negundo	Boxelder	FACW
Acer rubrum	Red Maple	FAC
Acer saccharum	Sugar Maple	FACU-
Agrostis sp.	Unknown	Unknown
Andropogon virginicus	Broonsedge	FAC-
Asimina triloba	Paw Paw	FAC
Aster simplex	Aster	FACW
Aster sp.	Aster	Unknown
Boehmeria cylindrical	False Nettle	FACW
Campsis radicans	Trumpet Creeper	FAC
Carex crinita	Fringed Sedge	FACW+
Carex gigantean	Giant sedge	OBL
Carex intumescens	Sedge	FACW
Carex sp.	Carex	Unknown
Carex tribuloides	Sedge	FACW
Carex vulpinoidea	Fox Sedge	FACW
Carpinus caroliniana	American Hophornbeam	FAC
Carya cordiformis	Bitternut Hickory	Fac
Carya ovata	Shagbark Hickory	FACU
Carya sp.	Hickory	Unknown
Celtis laevigata	Sugarberry	FACW
Cercis canadensis	Redbud	FACU
Chasmanthium latifolium	Indian Wood Oats	FAC-
Chasmanthium laxum	Slender Woodoats	FACW-
Conoclinium coelestinum	Mistflower	FACW
Cornus sp.	Dogwood	Unknown
Cyperus sp.	Umbrella Sedge	Unknown
Cyperus strigosus	Umbrella Sedge	FACW
Dichanthelium clandestinum	Panic Grass	FACW
Diodea teres	Buttonweed	FACW
Diodea virginica	Buttonweed	FAC
Diospyros virginiana	Persimmon	FAC
Echinochloa crusgalli	Barnyard Grass	FACW
Eleocharis linearis	Spike Rush	OBL
Eupatorium perfoliatum	Boneset	FACW
Fagus grandifolia	American Beech	FACU
Festuca arundinaceae	Tall Fescue	FAC-
Fraxinus pennsylvanica	Green Ash	FACW
Hibiscus moscheutos	Swamp Mallow	OBL
Ilex opaca	American Holly	FAC
Impatiens capensis	Spotted-Touch-Me-Not	FACW
Juncus effuses	Soft Rush	FACW
Juniperus virginiana	Red Cedar	FACU
Justicia americana	American Water Willow	OBL
Leersia oryzoides	Rice Cutgrass	FACW
Lemna sp.	Duckweed	OBL
Ligustrum vulgare	European privet	NI
Liquidambar styraciflua	Sweetgum	FAC
Lolium sp.	Ryegrass	Unknown

(cont'd)

Scientific Name	Common Name	Indicator Status
Lonicera japonica	Japanese Honeysuckle	FAC-
Lycopus sp.	Bugleweed	Unknown
Microstegium vimineum	Japan Grass	FAC
Mimulus alatus	Monkey Flower	FACW
Nyssa sylvatica	Black Gum	FAC
Panicum rigidulum	Panic Grass	FAC
Panicum sp.	Panic Grass	Unknown
Paspalum sp	Unknown	Unknown
Pinus taeda	Loblolly Pine	FAC
Plantago cordata	Heartleaf plantago	OBL
Platanus occidentalis	Sycamore	FAC
Polygonum hydropiper	Smartweed	OBL
Polygonum hydropiperoides	Smartweed	FACW
Polygonum sp.	Smartweed	Unknown
Polygonum virginianum	Jumpseed	FAC
Proserpinaca sp.	Mermaid Weed	OBL
Quercus alba	White Oak	FACU
Quercus lyrata	Overcup Oak	OBL
Quercus nigra	Water Oak	FAC
Quercus phellos	Willow Oak	FACW
Ranunculus sp.	Unknown	Unknown
Rubus sp.	Blackberry	Unknown
Rumex crispus	Curly Dock	FAC
Salix nigra	Black Willow	OBL
Saururus cernuus	Lizard Tail	OBL
Scirpus atrovirens	Green Bulrush	FACW
Scirpus cyperinus	Woolgrass	FACW
Scirpus validus	Bulrush	FACW
Smilax bona-nox	Greenbriar	FAC
Smilax rotundifolia	Greenbriar	FAC
Solanum carolinense	Horsenettle	FACU
Sphagnum sp.	Sphagnum	Unknown
Toxicodendron radicans	Poison Ivy	FAC
Typha latifolia	Cattail	OBL
Ulmus Americana	American Elm	FACW
Ulmus rubra	Slippery Elm	FAC
Vaccinium sp.	Blueberry	Unknown
Vitis sp.	Grape	FAC

APPENDIX D

Data Forms