ABSTRACT

CALLAHAN, KIPP. Vascular Flora of Pondberry Bay (Sampson County, North Carolina). (Under the direction of Dr. Alexander Krings).

Pondberry Bay Preserve (PBP) is a 2,067 acre Plant Conservation Preserve located in Sampson County. The preserve is comprised of diverse longleaf pine (*Pinus palustris* Mill.) habitat, an ecosystem which currently occupies only 3% of its historic range. It has been ranked by the North Carolina Natural Heritage Program as a Significant Natural Heritage Area. There are several rare natural communities that occur at the preserve, including Cypress Savanna communities (Typic: S2 G2G3; Acid: S2 G2?) and Streamhead Atlantic White Cedar Forest (S2 G2) (NC NHP 2021). In total, 344 taxa were documented to occur at Pondberry Bay Preserve. Seven of these taxa are listed as rare by the State of North Carolina and one of them, *Lindera melissifolia*, is federally-listed. An additional nine taxa are on the North Carolina Natural Heritage Program Watch List. An annotated checklist and a natural communities map are provided as part of this study.

Vascular Flora of Pondberry Bay (Sampson County, North Carolina)

by
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DEDICATION

I dedicate this work to Mitzi Harding and Tasha La Doux whose passion for botany inspired me to become a botanist.

BIOGRAPHY

Kipp’s love for the outdoors started young. He loved exploring the creeks and forests of northeast Connecticut where he grew up and spent hundreds of hours exploring and hiking in the White Mountains of New Hampshire as an undergraduate at Tufts University, where he studied Geology. However, it wasn’t until he was working at Joshua Tree National Park that he found his love for botany. While doing restoration work he fell in love with the desert flora. He was inspired by the botany staff at the park to learn more and enrolled at North Carolina State University to pursue that passion.

ACKNOWLEDGMENTS

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Introduction

Pondberry Bay Preserve (PBP) is an 836-hectare (2,067 acres) Plant Conservation Preserve located in Sampson County. It is home to a significant population of its namesake, the federally-listed pondberry (*Lindera melissifolia* (Walter) Blume, Lauraceae) as well as six other rare plant species and nine watchlist species. The preserve is comprised of diverse longleaf pine (*Pinus palustris* Mill.) habitat, an ecosystem which currently occupies only 3% of its historic range (Parks 2013), Carolina Bays, as well as several uncommon and rare natural communities such as Cypress Savanna communities (Typic: S2 G2G3; Acid: S2 G2?) and Streamhead Atlantic White Cedar Forest (S2 G2) (NC NHP 2021). It has been ranked by the North Carolina Natural Heritage Program as a Significant Natural Heritage Area (LeBlond and Grant 2007). Several botanical surveys of the site had previously been conducted by Richard LeBlond, Bruce Sorrie, and others (LeBlond, 2007). However, these surveys did not attempt to comprehensively catalog the flora on site and did not involve significant collecting to document the flora. The aims of this study were to: (1) inventory the vascular flora of Pondberry Bay Preserve, (2) create a comprehensive checklist of the flora supported by accessioned herbarium collections.

Materials and Methods

Field work was conducted beginning in the fall of 2013 and continued through the fall of 2015, and in summer 2019. Two scouting trips were taken in the fall of 2013 and twenty-eight collecting trips were made during the growing seasons in 2014 and 2015. Voucher specimens were collected from various locations during each collecting trip as part of the effort to document the complete flora of the preserve. GPS coordinates (WGS84) were collected for each location and associated with all specimens collected from within 25m of that location. These collections were pressed and dried, and are in the process of being accessioned into NCSC. Six days were spent ground truthing natural community mapping during June 2019.

In addition, voucher specimens that were historically collected from PBP or the nearby vicinity (i.e., within approximately 3 kilometers [2 miles]) and accessioned into the three major regional North Carolina herbaria (DUKE, NCSC, NCU) have been cited in this work. All vouchers from Sampson County in the aforementioned institutions were examined and label information was used to determine where the collections were made. All collections determined to have been from PBP or the vicinity were annotated. Taxon concepts follow Weakley (2015).

The vegetation communities on the preserve were classified using the natural community definitions outlined in the *Guide to Classification of the Natural Communities of North Carolina (Fourth Approximation)* (Schafale 2012) referred to hereafter as Guide. This classification system focuses on a wide array of ecological and physical factors in addition to vegetation, such as soils, topography, and organismal assemblages. This distinguishes the system from other vegetation-specific classification systems such as the US National Vegetation Classification system (USNVC 2019). The Guide was published with brief community descriptions with additional more detailed descriptions for each community to be published at a later date. Several of the more detailed community descriptions were released at the time of mapping (Coastal Plain Semipermanent Impoundment (Typic Marsh Subtype), Coastal Plain Small Stream Swamp Cypress Savanna (Acid Subtype), Cypress Savanna (Typic Subtype), Dry Oak Hickory Forest (Coastal Plain Subtype) (Schafale 2020). When available the detailed descriptions were utilized in addition to the original Guide.

The classification system is confined only to communities which occur naturally and as a result does not adequately treat systems that have been heavily altered by anthropogenic impacts. For the treatment of PBP, areas were mapped and described according to the natural community they best fit when possible. However, heavily altered areas that lacked consistent key indicators species were not assigned a natural community designation. Nonetheless, these areas are still floristically important and have been discussed below. Additionally, several of these areas cover large acreage at Pondberry Bay Preserve and are mapped along with the natural communities.

The communities at PBP were mapped with a minimum mapping unit of one acre, resulting in 18 map units. Additional communities occurring only as patchy inclusions within those meeting the criteria for mapping are discussed in the narrative (see Natural Communities and Anthropogenic Assemblages). Initial delineation of map units was done utilizing aerial photos (ESRI Imagery Basemap 2019). This was followed by field assessments to ground truth aerial delineation. These assessments were conducted over six site visits during the summer of 2019.

Study Area

Location

Pondberry Bay Preserve (836 hectares [2,067 ac]; Sampson County, North Carolina) is located in the Coastal Plain physiographic province approximately 3 kilometers (2 miles) northeast of Roseboro (Fig. 1.) The surrounding area is largely agricultural with cultivated lands adjacent to much of the preserve boundary. However, the Lakewood Golf and Country Club and a residential area are present on the western side. The southwest portion of the preserve is bordered by Little Coharie Creek and the Sampson County landfill is located immediately to the east of the preserve across White Woods Rd.

Site History

The area that is encompassed by PBP once belonged to the 21st governor of North Carolina, Gabriel Holmes. The remnant foundations of a house purported to belong to Holmes can be found in the southwest corner of PBP. The White family purchased the property from Governor Holmes in 1829 (FPC 2015). The area became known as White Woods, a name still reflected in the adjacent road. The property was sold to Canal Wood LLC (Leslie Starke, pers. comm.). Several hundred acres were converted to loblolly pine (*Pinus taeda*) and slash pine (*Pinus elliottii*) plantations. Over 100 hectares (250 acres) of the site still consists of unrestored pine plantation.

The Nature Conservancy acquired the property in 2001 and transferred it to the Plant Conservation Program (PCP) in 2002 (Leslie Starke, pers. comm.). The Plant Conservation Program is part of the North Carolina Department of Agriculture and Consumer Services. The program's mission is "to preserve the native plants of North Carolina in their natural habitats, now and for future generations". PBP is one of 25 preserves owned by the PCP. As part of its mission the PCP has taken an active role in managing the land at PBP. Prescribed burning has been an important tool used to manage the communities on the preserve.

Climate

The weather station closest to Pondberry Bay Preserve from which recent climate data is available is designated Clinton 2N (Id #: 311881). It is located approximately 20 kilometers (12 miles) to the east in Clinton, North Carolina (Sampson County). This weather station shows that the mean annual temperature for the 30-year period between1981–2010 was 16.3° C (61.4° F) and the mean annual precipitation was 1,234.9 mm (48.6 in). The mean maximum temperature for this period was 22.5° C (72.5° F) and the mean minimum was 10.2° C (50.4° F). The highest temperature recorded at this location between 1971–2017 was 40° C (104° F) and the lowest temperature was -16 ° C (3.0° F) (Western Regional Climate

Center 2018). The average growing season length, defined as the number of days without an air temperature lower than 0° C (32° F), during the period between 1951 and 1980 is 208 days (NCSU Extension 2018)

Physiography

Pondberry Bay Preserve lies within the broad physiographic region known as the Coastal Plain. The Coastal Plain stretches from southern New England to eastern Texas and consists of a gently sloping plain that extends into the ocean where it continues as the continental shelf. The combined Coastal Plain and Continental Shelf were primarily formed by the deposition of sediments from the erosion of the Appalachian Mountains into the ocean when sea level was significantly higher during the Cretaceous period. Additional sedimentary deposition has occurred during the Tertiary period as sea level has fluctuated (Fenneman 1938).

The Coastal Plain today is the emerged portion of this broader continuous plain. It is generally flat through its extent with an average elevation change of between 0.4 to 0.7 meters per kilometers (2 to 4 feet per mile) being common (Fenneman 1938). The Coastal Plain is separated from the adjacent physiographic region known as the Piedmont at what is known as the fall line, which represents the surface boundary between the crystalline basement rocks and the overlying sedimentary deposits that form the Coastal Plain (Fig. 2) (Watson 1910).

The Coastal Plain in North Carolina has six scarps that stretch across the region and divide the plain between the Piedmont and the Atlantic Ocean (Fig. 3). These scarps represent the ocean strand during various periods of stable higher sea level. The Coastal Plain can be divided into three distinct regions, the upper, middle, and lower with different geomorphic patterns around these scarps. PBP lies within the Middle Coastal Plain between the Coats Scarp at approximately 94 m (300ft) elevation and the Surry Scarp at 29 m (100ft) (Daniels and Gamble 1978). The Middle Coastal Plain is moderately dissected by streams in comparison to the much more heavily dissected Upper Coastal Plain and the less dissected Lower Coastal Plain.

Geology

The basement rocks underlying Pondberry Bay Preserve lie deep below the ground surface. These rocks, which lie over 152 m (500 feet) below the current surface consist of undifferentiated igneous, metamorphic, and metasedimentary (PzZu) similar to those found in the Piedmont region to the west (Fig. 4). Boreholes drilled in Sampson county showed these basement rocks to be phyllitic metamudstone and metagraywacke, considered part of the Spring Hope Terrane (Lawrence and Hoffman 1993). These rocks are extremely old with an estimated age of between 500 and 800 million years (Weems et al. 2011).

The basement rocks are overlain by Cretaceous sedimentary deposits that are largely unconsolidated and represent an extreme unconformity of millions of years. The Cape Fear Formation (Kcf) lies above the basement rocks and can be up to 73 m (240 feet) thick. It is composed of sand that was deposited as part of a large migrating braided river system which was spread widely across the region. These deposits are approximately 87 million years old (Weems et al. 2011).

The Cape Fear Formation is overlain by the Tar Heel Formation (Kt) which consists of interbedded sands and clays and formed in a marine delta environment. This formation contains abundant marine and terrestrial fossils. These deposits can be up to 81 m (265 feet) thick and formed 80 to 84 million years ago (Weems et al. 2011).

The Pleistocene surficial geology that overlays the Cretaceous sediments that form the foundation of the Coastal Plain play an important role in influencing the vegetation communities that occur at PBP. These surficial deposits consist of various sandy deposits including windblown dune deposits, known as the Pinehurst Formation (Qds)(Weems et al. 2011), and several sandy shallow marine deposits, the Varina Grove Formation (Qvg), the Windsor Formation (Qw), and the Waccamaw formation (Qwb) (Fig. 5).

The Pinehurst Formation (Qds) is approximate 10,000 years old and consists of very fine to medium grained windblown sand. It is occasionally silty and commonly has poorly defined soil horizons. It is up to 10 m (34 feet) thick (Markewich and Markewich 1994).

The Varina Grove Formation (Qvg), the Windsor Formation (Qw), and the Waccamaw formation (Qwb) share similar sedimentary characteristics. They consist of very fine to fine grained sand, can be silty and clayey grades downward from fine- to medium- to coarse to very coarse-grained sand with pebbles of quartz. The formations vary in age with the Windsor Formation being possibly as young as 730,000 years old and the Varina Grove Formation to be as much as 2.4 million years old. The formations range in thickness with maximum thicknesses between 17 and 19 m (55 and 63 feet) (Weems et al. 2011).

In addition to the Pleistocene sedimentary deposits, there are two more recent (Holocene) depositional units mapped at PBP. Alluvial deposits (Qal) consisting of fine- to- coarse grained sand of up to 8 m (26 feet) thick are located along the flood plain of Little Coharie Creek. These deposits can vary in age from 10,000 years old to the present. Additionally, a Holocene peat and muck (Qhm) deposit is mapped in one of the Carolina bays on the property. These deposits consist of organic material accumulating in areas with persistently high water tables and can be up to 6 ft thick and several thousand to several hundred years old. It is unlikely that these deposits would be contained to just one of the Carolina bays and all five bays on site are likely to contain similar organic deposits (Weems et al. 2011).

Soils

The soils at PBP are divided into 15 map units (Brandon 1985; Fig. 6). Each map unit is named after the soil series that is dominant within that map unit but soils of other series also exist within those map units. Generally, soils within a map unit will have similar properties but this is not always the case. This is an especially important consideration for small areas that are seasonal wetlands on site that will have hydric soils but are small enough that they will be incorporated into map units that are dominated by non-wetland soils. The dominant soils represent four soil orders (Fig. 7): Entisols, Inceptisols, Spodosols, and Ultisols. The maps units are described below, based on Brandon (1985), and are organized by the order of their named series.

Entisols

Entisols are soils that are extremely young and show little to no development. They represent active floodplains, recent landslides, etc., where sediment has been recently deposited and there has been very little time for soil formation processes to occur. There is one primarily Entisol formation on the preserve. It is the Chipley Sand.

The Chipley Sand (ChA) map unit is moderately well drained and occurs on smooth low ridges, mostly in the central part of the preserve. These areas are mostly flat with slopes of 0 to 2 percent. The seasonally high-water table is 0.6 to 0.9 m (2 to 3 feet) below the surface. Areas of Lumbee, Lynnhaven, Johns, and Kalmia soil series can all be contained in these map units.

In addition to the map units listed above, there is a map unit which contains large areas of both Bibb soil (which is an Entisol) and Johnston soil (which is an Inceptisol). This map unit, the Bibb and Johnston (BH), consists of poorly to very poorly drained soils along the margins of major streams or along drainages. The Bibb soils occur along the main stream channels while Johnston soils often occur in old drainages or seep areas. These soils form in sandy to loamy sediments. These soils can also have very deep muck (organic) layers. They occur on nearly level surfaces which are frequently flooded for short periods of time. The water table remains at or near the surface in these soils for several months of the year. In addition to Bibb and Johnston soils, Lumbee and Paxville soil series can also occur in this map unit. This map unit covers a large area of the preserve in the south west corner of the preserve along the banks of Little Coharie Creek and along some of the smaller drainages that feed into the creek. About 260 acres are mapped as Bibb and Johnston.

Inceptisols

Inceptisols are relatively young soils that have had sufficient time for some soil formation process to have occurred but do not have significant accumulations of clay, oxides, or organic matter. They therefore have only weakly formed horizons. There is one Inceptisol map unit on the preserve, the Johnston map unit.

Johnston soils are very poorly drained and loamy in texture. They generally occur on floodplains and are frequently flooded. The seasonal water table is often at or just below the surface. There can be areas of Bibb soils included in this map unit, usually right along stream channels. This map occurs at PBP as part of a floodplain adjacent to Little Coharie Creek in the southern part of the preserve.

Spodosols

Spodosols form in sandy soils in humid climates where acidic leaf litter (mainly from conifers) forms organic acids that strip away iron, aluminum and organic material near the surface. On the preserve, these soils are poorly drained and represent 14% of the soils. There are two Spodosol map units on the preserve, Leon and Lynnhaven.

The Leon (LeA) map unit consists of poorly drained sand on inter stream divides or in depressions. The slope varies from 0 to 2 percent and the seasonal high-water table is at or near the surface. Areas of Cainhoy, Lynnhaven, and Tomahawk soil series can be found in this map unit. Only two small areas (<5 acres) are mapped as Leon at PBP. They both occur in the southern end of the preserve.

The Lynnhaven (Ly) map unit consists of poorly drained sand typically located in flat areas or in Carolina Bays. Slopes generally range from 0 to 2 percent. The seasonal high-water table is at or near the surface. Areas of Chipley, Leon, and Torhunta soil series can be found in this map unit. At PBP, this soil type is found in the Carolina Bays and in some flat areas that stay wet for extended periods of time.

Ultisols

Ultisols are old highly weathered soils that have formed in humid environments and have clay accumulation in subsurface horizons. Ultisols are the dominant soils order in the southeastern US. The typical Ultisols in the southern US exhibit red clayey soils, particularly in the B horizon. However, many of the Ultisols at PBP have thick sandy horizons at the surface and while the subsurface horizons have more clay than the surfaces above them they are still sandy loams. Map units dominated by Ultisols make up the largest area of soils on the preserve. There are 1420 acres of Ultisols mapped that represent 67% of the preserve area. These map units, Autreyville, Blanton, Foreston, Johns, Lumbee, Marvyn, Norfolk, Rains, and Wagram, are described below.

Autreyville (AU) map unit soils are well drained loamy sands that generally occur on broad flat uplands with a slope of between 0 and 6 percent. The seasonally high-water table remains below 4 ft. In addition to Autreyville soils Blanton, Cainhoy, Foreston, Norfolk, and Wagram soils all occur in small areas within this map unit. There are several patches of Autreyville soils on the preserve in varying size ranging from 24 to 250 acres and they border several of the Carolina Bays on site (Brandon 1985).

Blanton (BoB) map unit soils are moderately well drained sands that occur on broad smooth sand ridges with slopes of between 0 and 6 percent. They are formed in sandy eolian and marine deposits. The seasonally high-water table typically remains below 6 ft. Small areas of Autreyville, Cainhoy, and Wagram can occur in this map unit. There are many patches of Blanton soils mapped on the preserve ranging from 4 to 65 acres in size (Brandon 1985).

The Foreston (Fo) map unit consist of moderately well drained loamy sands on broad uplands with nearly no slope. The seasonal high water table ranges between 2.5 and 3.5ft. Autreyville, Lynchburg, Rains, and Woodington soils can also occur in this map unit (Brandon 1985).

The Johns (Jo) map unit soils are poorly to moderately drained fine sandy loams that occur on stream terraces. They are nearly level with almost no slope. The seasonal high-water table lies 1.5 to 3 ft below the surface. A few small areas of Chipley, Lumbee, and Kalmia soil series may lie within the map unit. Only a small area of Johns soil occurs at Pondberry Bay Preserve (Brandon 1985). It is located in the southwestern corner of the preserve along Little Coharie Creek.

The Lumbee (Lm) map unit consists of poorly drained sandy loam on flats or shallow depressions occurring on stream terraces. The slope is between 0 and 2 percent. The seasonal high-water table lies at or near the surface. Chipley, Johns, and Paxville soils can also occur in this map unit (Brandon, 1985). There is only one small patch of Lumbee soil mapped at PBP. It is located on the west side of the preserve and is approximately 13 acres in size.

The Marvyn (MaC) map unit consists of well drained loamy sands. These soils are typically located along the upland edge of drainages. The slopes vary from 6 to 12 percent. The map unit can also include Gritney and Bibb soils (Brandon 1985). On the preserve these soils boarder the floodplain of Little Coharie Creek and are on the steepest slopes on the preserve.

Norfolk (NoA) soils are well drained loamy sands that occur on side slopes. The slopes range between 2 and 6 percent. The seasonal high-water table is between 1.2 and 1.8 m (4 and 6 feet) below the surface. In addition to Norfolk soils, soils from the Orangeburg, Goldsboro, and Wagram series may also be present in this map unit (Brandon 1985). These soils represent less than 4 acres on the preserve and are located in the Northeast corner.

The Rains (Ra) map unit consists of poorly drained soils on flat uplands. These soils sometimes end up with ponding and the seasonal high-water table is at or near the surface. Soils from the Coxville, Lynchburg, Pantego, Torhunta, and Woodington soil series may also be present in small part of the map unit.

The Wagram (WaB) map unit is a well-drained loamy sand that occurs in upland areas. Slopes range from 0 to 6 percent. Autreyveille, Blanton, Goldsborro, Orangeburg, and Norfolk soils can also make up areas of this map unit (Brandon 1985). Patches of these soils are located throughout the preserve and make up a total of about 250 acres.

The Woodington (Wo) map unit is comprised of poorly drained loamy sand that lies on nearly flat broad uplands. The seasonal high-water table is often at the surface. Foreston, Rains, Toisnot, and Torhunta soils can all be part of this map unit (Brandon 1985).

Natural Communities and Anthropogenic Assemblages

Sixteen natural communities and anthropogenic assemblages at PBP met the 1-acre threshold for mapping (Fig. 8). Four additional communities occur in smaller inclusions within those mapped. All recognized communities are discussed in narrative below.

Coastal Plain Floodplain Communities

Black Water Bottomland Hardwoods (High Subtype; G3G4) [*Pinus taeda – Quercus laurifolia/Vaccinium elliottii – Arundinaria gigantea* Forest (CEGL004736)]

There are approximately 190 acres mapped as Black Water Bottomland Hardwoods at PBP. The majority of this map unit is composed of the High Subtype although small pockets, generally less than 1 acre, of the Evergreen Subtype occur in the map unit.

This community occurs on terraces and ridges adjacent to Little Coharie Creek on the southwest side of PBP and transitions to Coastal Plain Small Stream Swamp at lower elevations in the more active floodplain. This community is characterized by dominance of bottomland oaks and *Pinus taeda.* Oaks include *Quercus lyrata, Quercus michauxii,* and *Quercus nigra. Liquidambar styraciflua* also comprises a significant component of the tree canopy. The understory is characterized by shrub species such as *Lyonia lucida, Magnolia virginiana,* and *Persea palustris.* Vines such as *Smilax rotundifolia* and *Toxicodendron radicans* are abundant in some areas. The herbaceous layer is often sparse but patches of

Arundinaria tecta or *Chasmantium laxum* can dominate. *Lorinseria areolata, Osmunda spectabilis*, and various *Dichanthelium* ssp. are also present.

Black Water Bottomland Hardwoods (Evergreen Subtype); G2) [*Pinus taeda* - *Quercus laurifolia* - *Chamaecyparis thyoides* - (*Quercus virginiana*) / *Vaccinium elliottii* Forest (CEGL007548)]

Within the Black Water Bottomland Hardwoods map unit there are several small patches that meet the criteria to be classified as Evergreen Subtype. This community is very similar to the High Subtype but is distinguished by the presence of *Chamaecyparis thyoides.*

Coastal Plain Semipermanent Impoundment (Typic Marsh Subtype; G4?) [*Polygonum (hydropiperoides, punctatum) – Leersia* spp. Herbaceous vegetation (CEGL004290)]

Areas of Coastal Plain Semipermanent Impoundment occur primarily on the west side of Little Coharie Creek in the vicinity of PBP and represent an area that sees significant flooding and has areas of persistent water. Because the southwestern boundary of PBP runs mainly along the creek, there are only about 9 acres of this community on the preserve located in a small area where the preserve boundary crosses over the creek and the area in the preserve represents only a small portion of the habitat in the area. This community lacks a substantial tree canopy and is characterized by an herbaceous layer tolerant of prolonged inundation. Diagnostic species include *Persicaria* spp., *Typha latifolia, Scirpus cyperinus*, and *Leersia hexandra*.

Coastal Plain Small Stream Swamp (G4) [*Nyssa biflora – Quercus nigra – Quercus laurifolia – Pinus taeda/Ilex opaca – Carpinus caroliniana* Forest (CEGL007350)].

This community occupies approximately 39 acres at Pondberry Bay Preserve and occurs along Little Coharie Creek which marks the western boundary of the preserve on the southern half. The community occupies the floodplain adjacent to the creek. The vegetation is characterized by wetland-affiliated plants. Several different tree species including *Nyssa biflora, Quercus nigra,* and *Ilex opaca. Taxodium distichum* is commonly present along the margins of the stream channel. The understory lacks a significant shrub component, but there is a diverse herbaceous understory which contains *Persicaria* spp., *Boehmeria cylindrica, Saururus cernuus,* etc.

<u>**Streamhead Pocosin Communities**</u>

Streamhead Pocosin (GNR) [*Pinus serotina – (Liriodendron tulipifera)/Lyonia lucida – Clethra alnifolia – Ilex glabra* Woodland (CEGL004435)] Streamhead pocosin communities make up 148 acres of PBP and are located along the various drainages that feed into Little Coharie Creek. These drainages are seepage fed and have water present throughout the year. At PBP, these areas are characterized by a pine-dominated overstory at the wettest parts with *P. taeda* dominating. *Pinus serotina, Chamaecyparis thyoides*, and *Liriodendron tulipifera* are also commonly present in the overstory. The understory and the stand edges are dominated by a variety of shrub species including *Clethra alnifolia, Ilex glabra,* and various *Lyonia* ssp. *Smilax laurifolia* is often present in significant densities. The herbaceous layer is characterized by various fern species including *Anchistea virginica* and *Osmundastrum cinnamomeum*.

Streamhead Atlantic White Cedar Forest (G1) [*Chamaecyparis thyoides – (Liriodendron tulipifera)/Lyonia lucida Forest* (GEGL007563) Streamhead Atlantic White Cedar Forest are closely associated with the Streamhead Pocosin areas at the preserve and have not been included as a separate map unit. Typically, there are small stands of this community patchily distributed within broader areas of Streamhead Pocosin. This community is characterized by the dominance of *Chamaecyparis thyoides.* At PBP there is very little additional diversity in these stands. There are occasional individuals of *Liriodendron tulipifera* scattered among those of *Chamaecyparis thyoides,* but there is very little in the way of understory vegetation.

<u>Coastal Plain Depression Communities</u>

Cypress Savanna (Typic Subtype; G2G3) [*Taxodium ascendens/ Panicum hemitomon – Polygala cymosa Woodland* (CEGL003733)] Three of the five Carolina Bays at PBP contain the Cypress Savanna (Typic Subtype) community. The total area is approximately 30 acres. The canopy is dominated by *Pinus taeda* and *Nyssa biflora* although there are several *Taxodium ascendens* present in the northernmost bay, Pondberry Bay. The shrub layer contains several *Vaccinium* species including *V. fuscatum* and *V. formosum*. *Cyrilla racemiflora* and *Morella cerifera* are also present, especially on the margins. The herbaceous layer is highly diverse. The areas that receive the most inundation are dominated by *Dichanthelium wrightianum, Lachnanthes caroliniana,* and *Panicum hemitomon. Sphagnum* sp. are also dominant in some areas.

Cypress Savanna (Acid Subtype; G2?) [*Taxodium ascendens/ Woodwardia virginica* Woodland (CEGL004441)] The Cypress savanna (Acid Subtype) community occurs in two Carolina bays at PBP. These areas comprise approximately 18 acres. The tree canopy of these bays is dominated by *Nyssa biflora*, although *Acer rubrum* and *Pinus taeda* are also sometimes present. These communities have a higher shrub density than the Typic Subtype and *Cyrilla racemiflora, Lyonia lucida, Vaccinium fuscatum, Vaccinium formosum* are all present in moderate density. *Smilax laurifolia* and *S. rotundifolia* are abundant. The herb layer is less diverse than the Typic Subtype and is dominated by more acid-affiliated species such as *Anchistea virginica* (*Woodwardia virginica*) and *Carex glaucescens*.

Small depression pocosin (Typic Subtype; G2G3) [*Pinus serotina*/ *Cyrilla racemiflora – Lyonia lucida – Vaccinium fuscatum* Woodland (CEGL004434)] The small depression pocosin communities present at PBP are less than 1 acre in size and as a result are not included as a map unit. This community occurs in flat areas with small depressions that are inundated for short periods. On site this community is characterized by the presence of *Pinus serotina* in the tree canopy. The shrub layer is dominated by *Cyrilla racemiflora, Lyonia lucida,* and *Ilex glabra*. Various *Vaccinum* species are often present but do not dominate. Various *Smilax* species including *S. laurifolia* and *S. rotundifolia* are also present. There is no significant herb cover in this community.

Dry Longleaf Pine Communities

Dry Longleaf Pine communities are among the most widespread natural communities at Pondberry Bay Preserve occupying over 600 acres, the majority of which lie on the eastern portion of the preserve adjacent to White Woods Road. These communities are all mapped as one map unit, Pine/Scrub Oak Sandhill. The majority of this map unit is composed of Pine/Scrub Oak Sandhill (Mixed Oak Subtype). However additional dry longleaf pine communities are present within the map unit and the various communities often intergrade with each other. It is too difficult to distinguish these communities from aerial photos to map them at a smaller scale.

Pine/Scrub Oak Sandhill communities have a canopy dominated by *Pinus palustris* but also have a layer of scrub oaks present with a mixture of species including *Quercus laevis, Quercus incana, and margarettae* and others. The shrub layer is often sparse with *Gaylussacia dumosa* most commonly occurring. *Aristida stricta* is dominant in the herb layer. The various subtypes are broken down below.

Pine/Scrub Oak Sandhill (Mixed Oak Subtype; G3?) [*Pinus palustris / Quercus laevis – Quercus (incana/margarettae) / Gaylussacia dumosa / Aristida stricta* Woodland (CEGL003951). The Mixed Oak Subtype is distinguished by abundant *Quercus laevis*, *Quercus incana*, and *Quercus margarettae*. It is distinguished from the Blackjack Subtype by a lack of significant numbers of *Q. marilandica*.

Pine/Scrub Oak Sandhill (Mesic Transition Subtype; G2G3) [*Pinus palustris / Quercus incana / Aristida stricta – Sorghastrum nutans –Anthaenantia vilosa* Woodland (CEGL003578)] The Mesic Transition Subtype is distinguished from other Pine/Oak Sandhill types by characteristic mesic herbaceous species such as *Sorghastrum nutans, Paspalum bifidum,* and *Desmodium lineatum*.

Pine/Scrub Oak Sandhill (Blackjack Subtype; G2G3) [*Pinus palustris/Quercus marilandica / Gaylussacia dumosa / Aristida stricta* Woodland (CEGL003595). The Blackjack Subtype is distinguished from the other Pine/Scrub Oak Sandhill communities by the presence of a significant number of *Quercus marilandica.*

Mesic Pine Savanna (Coastal Plain Subtype; G2G3) [*Pinus palustris / Amorpha herbaceae* var. *herbaceae / Aristida stricta – Sorghastrum nutans* Woodland (CEGL003569)] Mesic Pine Savanna habitat is differentiated from the similar Pine/Scrub Oak Sandhill communities by the lack of a significant scrub oak component. Additionally, the herbaceous layer will contain more mesic taxa than Pine/Scrub Oak Sandhill communities.

<u>Coastal Plain Oak Forest Communities</u>

Dry Oak Hickory Forest (Coastal Plain Subtype G4?) [*Quercus falcata – Quercus stellata – Carya alba / Vaccinium* spp. *Coastal Plain Forest* (CEGL007246)] There are approximately 135 acres of Dry Oak Hickory Forest at PBP. This community is characterized by a canopy dominated by oak and hickory species and is differentiated from Pine/Scrub Oak Sandhill communities by the lack of a significant *Pinus palustris* component and the presence of *Carya* spp. At PBP, *Quercus falcata* is the dominant species and the tree layer has a wide variety of additional species including *Q. stellata, Q. alba, Carya* spp., *Nyssa sylvatica, Oxydendrum arboreum,* etc. The understory is characterized by various shrubs in the Ericaceae including *Vaccinium pallidum, Vaccinium tenellum, Gaylussacia dumosa, and G. frondosa. Smilax rotundifolia, S. bona-nox*, and *Gelsemium sempervirens* are vines which commonly occur in the understory. There is not a significant herbaceous component to the understory.

<u>Anthropogenic Assemblages on Site</u>

Bamboo Stand

In the southeastern corner of PBP, there is a large stand of fishpole bamboo, *Phyllostachys aurea*. This stand is approximately 3 acres in size and has almost no plant diversity. There are a few larger trees, mainly *Pinus taeda*, that occur within the stand but otherwise it is a monodominant stand. There are no shrubs, vines, or herbaceous plants that occur in significant numbers in the understory.

Clear-cut areas

As part of the ongoing management of Pondberry Bay the NC Plant Conservation Program has engaged in efforts to remove large numbers of *Pinus taeda* from the site in an effort to increase suitable habitat for *Pinus palustris*-dominated communities. There are several areas of the preserve that had recently been clear-cut as part of this effort. The total acreage is over 200 acres. These areas are in a heavily altered state with high densities of young trees regenerating. These areas are primarily characterized by a lack of any developed tree canopy and are dominated by *Quercus* ssp. and *Liquidambar styraciflua*. There is also a high density of young shrubs including *Ilex coriacea* and *I. glabra*, *Lyonia* ssp., *Vaccinium* ssp., and *Gaylussacia* ssp.

Drainage ditches

There are several prominent drainage ditches on site. The larger of these ditches are dominated by wetland shrubs such as *Cyrilla racemiflora, Lyonia lucida, Ilex coriacea*, and *Ilex glabra*. However, the smaller ditches often have high levels of herbaceous vegetation and can contain species that are not commonly found elsewhere such as *Polygala lutea* and *Xyris ambigua.*

Mill Pond

In the southwest corner of the preserve there is an artificial impoundment that has been created with a partially intact dam. This impoundment holds water most of the year. The total impoundment area is approximately 1.5 acres.

***Pinus taeda* and *Pinus palustris* woodland**

An additional 180 acres of PBP is composed of stands dominated by either *Pinus taeda* or *Pinus palustris* but lack the species composition and structure to conform to one of the natural community designations but have not been clearly planted the way the areas mapped as pine plantation have been. The understory of this assemblage varies considerably depending on moisture, soil type, and canopy density. Common understory species include *Ilex coriacea* and *I. glabra*, *Lyonia* ssp., *Vaccinium* ssp., and *Gaylussacia* ssp. Additionally, *Aristida stricta* can be dominant in areas where the canopy is more open.

Powerline Cooridor

A high-voltage line bisects PBP and there is a maintained powerline corridor that is just under 3 hectares (8 acres). The corridor is maintained to be free from most trees and shrubs and is dominated by disturbance-affiliated herbaceous species. The corridor is dominated by various species from the Poaceae and Fabaceae. *Aristida stricta*, *Danthonia sericea*, and *Dichanthelium* ssp. are abundant, along with *Amorpha herbacea* and *Tephrosia* ssp. Species such as *Rumex hastatulus* and various *Lechea* species, including *L. mucronata and L. racemulosa* are present at much higher densities than anywhere else.

Remnant Pine Plantation

Over 500 acres of Pondberry Bay Preserve is occupied by remnant pine plantations. These areas primarily consist of a closed canopy of *Pinus taeda*, often planted in windrows. The understory layer consists of shrubs and herbs with varying composition across the site dependent on moisture and soil. Common understory species include *Ilex coriacea* and *I. glabra*, *Lyonia* ssp., *Vaccinium* ssp., and *Gaylussacia* ssp. There is not a significant herbaceous component.

Floristic Summary

Three hundred forty-seven taxa (rank of species and below) were documented to occur at Pondberry Bay Preserve as part of this floristic inventory. These 344 taxa were members of 208 genera and 83 different plant families (Table 1). The eudicots were the most diverse group with 237 taxa (68% of taxa). Monocots followed with 87 taxa (25% of taxa). The remaining groups were all signicantly less diverse, with Ferns and Allies, Gymnosperms, and Magnoliids only having 7 taxa each (2% of taxa per group) and finally Basal Angiosperms with 1 taxon (<1% of taxa). The most species-rich plant families were Asteraceae with 39 taxa (11%), Poaceae 29 (8%), Cyperaceae with 27 taxa (8%), Fabaceae with 22 taxa (6%), Ericaceae with 18 taxa (5%), and Rosaceae with 16 taxa (5%).

Seven of these taxa are listed as rare by the State of North Carolina. *Lindera melissifolia* (S1 G3) is state- and federally-listed. *Crocanthemum carolinianum* (S1 G4) is listed as Endangered by the state and *Ludwigia ravenii* (S1 G1) is listed as Threatened. Three other taxa, *Astragalus michauxii* (S3 G3), *Litsea aestivalis* (S2S3 G3), and *Rhexia aristosa* (S3 G3) are designated as species of Special Concern. Finally, *Eupatorium resinosum* (S3 G3), is designated as Significantly Rare. An additional nine taxa are on the Watch List (Table 2.)

Taxonomic Treatment

The checklist is organized by the major groups of (1) ferns and allies, (2) gymnosperms, (3) basal angiosperms, (4) magnoliids, (5) monocots, and (6) eudicots, with taxa in each group arranged alphabetically by family, then genus, then species.

FERNS AND ALLIES

ASPLENIACEAE

1. ASPLENIUM L.

Asplenium platyneuron (L.) Britton, Sterns & Poggenb. [=RAB]

Acrostichum platyneuron L.

Black Water Bottomland Hardwoods (High Subtype). Infrequent. Apr–Oct.

Callahan 145 (NCSC).

BLECHNACEAE

1. ANCHISTEA C. Presl

Anchistea virginica (L.) C. Presl [=*Woodwardia virginica* (L.) Sm.–RAB]

Blechnum virginicum L.

Coastal Plain Small Stream Swamp, Streamhead Pocosin, Streamhead Atlantic White Cedar Forest, Disturbed Carolina Bays. Frequent. Jun–Sep.

Callahan 142 (NCSC); *Callahan 143* (NCSC).

2. LORINSERIA C. Presl

Lorinseria areolata (L.) C. Presl [=RAB]

Acrostichum areolatum L.

Black Water Bottomland Hardwoods (High Subtype); Coastal Plain Small Stream Swamp, Streamhead Pocosin, Streamhead Atlantic White Cedar Forest, Disturbed Carolina Bays. Frequent. May–Sep.

Callahan 141 (NCSC).

DENNSTAEDTIACEAE

1. PTERIDIUM Gled. ex Scop.

Pteridium latiusculum (Desv.) Hieron. ex Fries var. ***pseudocaudatum*** (Clute) Maxon [=*P. aquilinum* (L.) Kuhn var. *pseudocaudatum* (Clute) Heller–RAB]

Pine/Scrub Oak Sandhill (Mixed Oak Subtype), Pine/Scrub Oak Sandhill (Mesic Transition Subtype), Pine/Scrub Oak Sandhill (Blackjack Subtype), Mesic Pine Savanna (Coastal Plain Subtype). Abundant.

Callahan 140 (NCSC).

LYCOPODIACEAE

1. LYCOPODIELLA Holub

Lycopodiella prostrata (R. M. Harper) Cranfill [=RAB]

Lycopodium prostrata Cranfill

W7; S2, G5T4. Cypress Savanna (Acid Subtype), Cypress Savanna (Typic Subtype), Drainage Ditches. Frequent.

Callahan 404 (NCSC).

POLYPODIACEAE

1. PLEOPELTIS Humb. & Bonpl. ex Willd.

Pleopeltis michauxiana (Weath.) Hickey & Sprunt [=RAB]

Polypodium polypodioides (L.) Watt. var. *michauxianum* Weath.

Black Water Bottomland Hardwoods (High Subtype). Rare. Jun–Oct.

Callahan 144 (NCSC).

OSUMUNDACEAE

1. OSMUNDA L.

Osmunda spectabilis Willd. [=*O. regalis* L. var. *spectabilis*–RAB]

Black Water Bottomland Hardwoods (High Subtype), Coastal Plain Small Stream Swamp. Frequent. Mar–Jun.

Callahan 696 (NCSC).

GYMNOSPERMS

CUPRESSACEAE

1. CHAMAECYPARIS Spach

Chamaecyparis thyoides (L.) Britton, Sterns & Poggenb. var. ***thyoides*** [=RAB]

Cupressus thyoides L.

Streamhead Atlantic White Cedar Forest, Streamhead Pocosin. Abundant. Mar–Apr; Oct–Nov.

Callahan 75 (NCSC); *Callahan 308* (NCSC).

2. TAXODIUM Rich.

Taxodium ascendens Brong. [=RAB]

Cypress Savanna (Typic Subtype) Rare. Mar–Apr; Oct.

Callahan 42 (NCSC).

Taxodium distichum (L.) Rich. [=RAB]

Cupressus distichum L.

Coastal Plain Small Stream Swamp. Common. Mar–Apr; Oct.

Callahan 686 (NCSC).

PINACEAE

1. PINUS L.

Pinus elliottii Engelm. [<*P. elliottii*–RAB]

Not seen on site by present author. Reported on site in pine plantations (LeGrand 2001). Jan–Feb; Oct–Nov.

Pinus palustris Mill. [=RAB]

Pine/Scrub Oak Sandhill (Mixed Oak Subtype), Pine/Scrub Oak Sandhill (Mesic Transition Subtype) Pine/Scrub Oak Sandhill (Blackjack Subtype), Mesic Pine Savanna (Coastal Plain Subtype), Dry Oak Hickory Forest (Coastal Plain Subtype) Pine Plantation, *Pinus taeda* woodland. Abundant. Mar–Apr; Sep–Oct.

Callahan 718 (NCSC).

Pinus serotina Michx. [=RAB]

Small depression Pocosin (Typic Subtype), Streamhead Pocosin, Coastal Plain Small Stream Swamp. Infrequent. Apr; Aug.

Callahan 303 (NCSC).

Pinus taeda L. [=RAB]

Black Water Bottomland Hardwoods, Streamhead Pocosin, Nonriverine Swamp Forest (Mixed Subtype), Nonriverine Swamp Forest (Sweetgum Subtype), Small depression Pocosin, Cypress Savanna (Acid Subtype), Cypress Savanna (Typic Subtype), Pine/Scrub Oak Sandhill (Mixed Oak Subtype), Pine/Scrub Oak Sandhill (Mesic Transition Subtype), Pine/Scrub Oak Sandhill (Blackjack Subtype), Mesic Pine Savanna (Coastal Plain Subtype), Dry Oak Hickory Forest (Coastal Plain Subtype) Pine Plantation, Pinus taeda woodland. Abundant. Mar–Apr; Oct–Nov.

Callahan 50 (NCSC).

BASAL ANGIOSPERMS

NYMPHAEACEAE

1. NUPHAR Sm.

Nuphar sagittifolia (Walter) Pursh [=*N. luteum* (L.) Sibth. & J.E. Smith ssp. *sagittifolium* (Walter) E.O. Beal]

Nymphaea sagittifolia Walter

W1; S2, G5T4. Occurs in Little Coharie Creek. Rare. Apr-Oct

Vicinity: *Radford 4336* (NCU); *Wood 8487* (NCU).

MAGNOLIIDS

LAURACEAE

1. LINDERA Thunb.

Lindera melissifolia (Walter) Bloom [=RAB]

Laurus melissifolia Walter.

State E; Federal E; S1, G2G3 Cypress Savanna (Typic Subtype). Rare. Mar–Apr; Aug–Sep.

Callahan 3 (NCSC); *Callahan 51* (NCSC).

2. LITSEA Lam.

Litsea aestivalis (L.) Fernald [=RAB]

Laurus aestivalis L.

SC-V; S2S3, G3? Not seen on site by present author. Reported in Cypress Savanna (Typic Subtype) (LeBlond 2007). Mar–Apr; May–Jun.

3. PERSEA Mill.

Persea palustris (Raf.) Sarg. [<*P. borbonia*–RAB]

Tamala palustris Raf.

Streamhead Pocosin, Nonriverine Swamp Forest (Mixed Subtype), Nonriverine Swamp Forest (Sweetgum Subtype). Frequent. May–Jun; Sep–Oct.

Callahan 53 (NCSC).

4. SASSAFRAS J Presl.

Sassafras albidum (Nutt.) Nees [=RAB]

Laurus albidum Nutt.

Pine Plantation. Frequent. Mar–Apr; Jun–Jul.

Callahan 152 (NCSC).

MAGNOLIACEAE

1. LIRIODENDRON L.

Liriodendron tulipifera L. var. ***tulipifera*** [<*L. tulipifera*–RAB]

Black Water Bottomland Hardwoods (High Subtype), Coastal Plain Small Stream Swamp Occasional. Apr–Jun; Sep–Oct.

Callahan 309 (NCSC).

1. MAGNOLIA L.

Magnolia grandiflora L. [=RAB]

Pine Plantation. Rare. Apr–Jun; Sep–Oct.

Callahan 153 (NCSC).

Magnolia virginiana L. var. ***virginiana*** [<*M. virginiana*–RAB]

Drainage ditches; Streamhead Pocosin. Frequent. Apr–Jun; Jul–Oct.

Callahan 17 (NCSC).

MONOCOTS

COMMELINACEAE

1. CUTHBERTIA Small

Cuthbertia graminea Small [=*Tradescantia rosea* Vent. var. *graminea* (Small) E.S. Anderson & Woodson–RAB]

Pine/Scrub Oak Sandhill, Mesic Pine Savanna. Occasional. May–Jul

Callahan 71 (NCSC); *Callahan 105* (NCSC); *Callahan 106* (NCSC).

CYPERACEAE

1. BULBOSTYLIS Kunth

Bulbostylis ciliatifolia (Elliott) Fernald [=RAB]

Scirpus ciliatifolius Elliott

Cypress Savanna, Drainage ditches, Roadsides and disturbed areas. Occasional. Jul–Oct.

Callahan 409 (NCSC).

Bulbostylis coarctata (Elliott) Fernald [=RAB]

Scirpus coarctatus Elliott

Pine/Scrub Oak Sandhill, Mesic Pine Savanna. Occasional. Jul–Oct.

Callahan 429 (NCSC).

2. CAREX L.

Carex bullata Schkuhr ex Willd. [=RAB]

Not seen at PBP by the present author. Expected in acidic depressions and swamps (Weakley 2015). May–Jun.

Vicinity: *Godfrey 4537* (DUKE).

Carex elliottii Schwein. & Torr. [=RAB]

Not seen at PBP by the present author. Expected in depressions and swamps (Weakley 2015). May–Jun.

Grant s.n. (NCU)

Carex intumescens Rudge var. ***intumescens*** [<*C. intumescens*–RAB]

Not seen at PBP by the present author. Expected in depressions and swamps (Weakley 2015). May–Jul.

Vicinity: *Marx 3059* (NCU).

Carex glaucescens Elliott [=RAB]

Cypress Savanna (Acid Subtype) Infrequent. May–Jun

Callahan 426 (NCSC); *Callahan 426* (NCSC); *Callahan 426* (NCSC).

Vicinity: *Godfrey 5713* (DUKE).

Carex nigromarginata Schwein. [=*C. nigromarginata* var. *nigromarginata*–RAB]

Pine/Scrub Oak Sandhill, Mesic Pine Savanna. Occasional. Mar–May.

Callahan 680 (NCSC).

Carex pensylvanica Lam. [=*C. pennsylvanica* var. *pennsylvanica*–RAB]

Pine/Scrub Oak Sandhill. Infrequent. Apr–Jun.

Callahan 718 (NCSC).

Carex vulpinoidea Michx. [=RAB]

Not see on site by present author. Expected in pine savannas and ditches (Weakley 2015). Jul–Aug.

Vicinity: *Godfrey 4540* (DUKE).

3. CYPERUS L.

Cyperus plukenetii Fernald [=RAB]

Pine/Scrub Oak Sandhill, Mesic Pine Savanna. Occasional. Jul–Oct.

Callahan 410 (NCSC); *Callahan 411* (NCSC).

4. DULICHIUM Pers.

Dulichium arundinaceum (L.) Britton var. ***arundinaceeum*** [<*D. arundinaceum*–RAB]

Cyperus arundinaceus L.

Drainage ditches; Mill Pond. Occasional. Jul–Oct.

Callahan 420 (NCSC).

5. ELEOCHARIS R. Br.

Eleocharis microcarpa Torr. var. ***filiculmis*** Torr. [<*E. macrocarpa*–RAB]

Cypress Savanna (Typic Subtype). Occasional. Jun–Sep.

Callahan 408 (NCSC).

Eleocharis obtusa (Willd.) Shult. [<*E. ovata*–RAB]

Scirpus obtusa Willd.

Cypress Savanna (Typic Subtype); Drainage ditches. Occasional. Jul–Sep.

Callahan 407 (NCSC).

6. FUIRENA L.

Fuirena squarrosa Michx. [<*F. squarrosa*–RAB]

Cypress Savanna (Typic Subtype); Drainage ditches; Streamhead pocosin. Occasional. Jul–Oct.

Callahan 412 (NCSC); *Callahan 413* (NCSC).

7. RHYNCHOSPORA L.

Rhynchospora chalarocephala Fernald & Gale [=RAB]

Cypress Savanna (Typic Subtype); Drainage ditches; Roadsides and disturbed areas. Frequent. Jul–Sep.

Callahan 452 (NCSC); *Callahan 453* (NCSC); *Callahan 454* (NCSC); *Callahan 455* (NCSC); *Callahan 456* (NCSC); *Callahan 457* (NCSC); *Callahan 458* (NCSC); *Callahan 459* (NCSC); *Callahan 460* (NCSC).

Rhynchospora globularis (Chapm.) Small [<*R. globularis*–RAB]

Rhynchospora cymosa (Willd.) Nutt. var. *globularis* Chapm.

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Drainage ditches; Roadsides and disturbed areas. Occasional. Jun–Sep.

Callahan 425 (NCSC).

Rhynchospora glomerata (L.) Vahl var. ***glomerata*** [<*R. glomerata*–RAB]

Schoenus glomeratus L.

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Drainage ditches. Occasional. Jul–Sep.

Callahan 415 (NCSC); *Callahan 421* (NCSC); *Callahan 451* (NCSC).

Rhynchospora grayi Kunth [=RAB]

Pine/Scrub Oak Sandhill, Mesic Pine Savanna. Infrequent. Jun–Sep.

Callahan 422 (NCSC).

Rhynchospora inexpansa (Michx.) Vahl [=RAB]

Schoenus inexpansus Michx.

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Drainage ditches; Streamhead pocosin. Occasional. Jul–Sep.

Callahan 423 (NCSC); *Callahan 701* (NCSC).

Rhynchospora macrostachya Torr. ex A. Gray [=RAB]

Cypress Savanna (both Subtypes); Drainage ditches. Infrequent. Jul–Sep.

Callahan 416 (NCSC).

Rhynchospora microcephala (Britton) Britton [=RAB]

Rhynchospora axillaris (Lam.) Britton var. *microcephala* Britton

Cypress Savanna (both Subtypes). Occasional. Jul–Oct.

Callahan 450 (NCSC).

Rhynchospora perplexa Britton [=RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype). Occasional. Jul–Sep.

Callahan 418 (NCSC); *Callahan 419* (NCSC).

Rhynchospora plumosa Elliott [<*R. plumosa*–RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Pine/Scrub Oak Sandhill. Rare. May–Aug.

Callahan 417 (NCSC).

8. SCIRPUS L.

Scirpus cyperinus (L.) Kunth [=RAB]

Eriophorum cyperinum L.

Cypress Savanna (Typic Subtype). Occasional. Aug–Sep.

Callahan 414 (NCSC); *Callahan 424* (NCSC); *Callahan 704* (NCSC).

9. SCLERIA P. J. Bergius.

Scleria ciliata Michx. var. ***ciliata*** [<*S. ciliata*–RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype), Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype). Occasional. May–Sep.

Callahan 399 (NCSC).

Scleria georgiana Core [=RAB]

W1; S3, G4Cypress Savanna (Typic Subtype). Rare. Jun–Aug.

Callahan 107 (NCSC); *Callahan 400* (NCSC).

Scleria nitida Willd. ex Kunth [<*S. triglomerata* Michx.–RAB]

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype). Occasional. May–Oct.

Callahan 396 (NCSC); *Callahan 398* (NCSC); *Callahan 401* (NCSC).

ERIOCAULACEAE

1. ERIOCAULON L.

Eriocaulon decangulare L. var. ***decangulare*** [<*E. decangulare*–RAB]

Cypress Savanna (Typic Subtype), Drainage Ditches. Infrequent. Jun–Oct.

Callahan 287 (NCSC); *Callahan 289* (NCSC); *Callahan 325* (NCSC); *Callahan 326* (NCSC).

2. LACHNOCAULON L.

Lachnocaulon anceps (Walter) Morong [=RAB]

Eriocaulon anceps Walter

Pine/Scrub Oak Sandhill, Mesic Pine Savanna (Coastal Plain Subtype). Infrequent. May–Oct.

Callahan 31 (NCSC); *Callahan 91* (NCSC); *Callahan 92* (NCSC); *Callahan 93* (NCSC).

HAEMODORACEAE

1. LACHNANTHES Elliott

Lachnanthes caroliniana (Lam.) Dandy [=RAB]

Dilatris caroliniana Lam.

Cypress Savanna (Typic Subtype). Infrequent. Jun–Sep; Sep–Nov.

Callahan 43 (NCSC); *Callahan 322* (NCSC).

HYPOXIDACEAE

1. HYPOXIS L.

Hypoxis hirsuta (L.) Coville [=*Hypoxis hirsuta* var. *hirsuta*–RAB]

Ornithogalum hirsutum L.

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype). Occasional. Mar–Jun; May–Jul.

Callahan 338 (NCSC).

IRIDACEAE

1. IRIS L.

Iris verna L. var. ***verna*** [=RAB]

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype); Ruderal area. Rare. Mar–May; May–Jun.

Callahan 23 (NCSC).

2. SISYRINCHIUM L.

Sisyrinchium fuscatum E.P. Bicknell [=RAB]

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype). Occasional. Apr–Jun; Jun–Oct.

Callahan 108 (NCSC); *Callahan 109* (NCSC); *Callahan 110* (NCSC).

JUNCACEAE

1. JUNCUS L.

Juncus biflorus Elliott [=RAB]

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype). Infrequent. Jun–Oct.

Callahan 250 (NCSC).

Juncus canadensis J. Gay ex Laharpe [=RAB]

Drainage Ditches; Mill Pond. Occasional. Jul–Oct.

Callahan 243 (NCSC); *Callahan 253* (NCSC); *Callahan 257* (NCSC).

Juncus debilis A. Gray [=RAB]

Drainage Ditches; Mill Pond. Occasional. May–Aug.

Callahan 254 (NCSC); *Callahan 255* (NCSC).

Juncus dichotomus Elliott [>*J. dichotomus*–RAB]

Drainage ditches; Roadsides and disturbed areas. Occasional. Jun–Oct.

Callahan 244 (NCSC); *Callahan 246* (NCSC); *Callahan 258* (NCSC); *Callahan 259* (NCSC); *Callahan 260* (NCSC); *Callahan 261* (NCSC).

Vicinity: *Wilbur 81060* (DUKE).

Juncus effusus L. var. ***effusus*** [=RAB]

Drainage ditches; Roadsides and disturbed areas. Occasional. Jun–Sep.

Callahan 242 (NCSC); *Callahan 256* (NCSC).

Juncus marginatus Rostk. [=RAB]

Cypress Savanna (Typic Subtype), Drainage Ditches. Occasional. Jun–Sep.

Callahan 247 (NCSC); *Callahan 262* (NCSC).

Juncus pelocarpus E. Mey. [=*J. abortivus* Chapm.–RAB]

Drainage ditches. Infrequent. Jul–Oct.

Callahan 249 (NCSC).

Juncus repens Michx. [=RAB]

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype); Cypress Savanna (Typic Subtype), Drainage Ditches. Occasional. Jun–Oct.

Callahan 248 (NCSC).

Juncus scirpoides Lam. var. ***compositus*** R.M. Harper. [<*J. scirpoides*–RAB]

Drainage ditches; Roadsides and disturbed areas. Infrequent. Jun–Oct.

Callahan 252 (NCSC).

Juncus scirpoides Lam. var. ***scirpoides*** [<*J. scirpoides*–RAB]

Cypress Savanna (Typic Subtype); Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype); Drainage ditches; Roadsides and disturbed areas. Ocassional. Jun–Oct.

Callahan 245 (NCSC); *Callahan 251* (NCSC).

NARTHECIACEAE

1. ALETRIS L.

Aletris farinosa L. [=RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype). Rare. Apr–Jun; Jul–Aug.

Callahan 296 (NCSC).

ORCHIDACEAE

1. TIPULARIA Nutt.

Tipularia discolor (Pursh) Nutt. [=RAB]

Orchis discolor Nutt.

Pine Plantation. Rare. Jul–Sep.

Callahan 162 (NCSC).

POACEAE

1. AMPHICARPUM Kunth

Amphicarpum amphicarpon (Pursh) Nash [=*Amphicarpum purshii* Kunth–RAB]

Milium amphicarpon Pursh

W1; S3, G4. Cypress Savanna (Typic Subtype). Occasional. Aug–Oct.

Callahan 475 (NCSC); *Callahan 476* (NCSC).

2. ANDROPOGON L.

Andropogon glaucopsis Elliott [<*A. virginicus*–RAB]

Reported on site (LeBlond 2007). Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype). Sep–Oct.

Andropogon perangustatus Nash [=RAB]

W1; S2S3, G5T4. Reported on site (LeBlond 2007). Cypress Savanna (Typic Subtype). Infrequent. Aug–Oct.

Andropogon virginicus L. [=RAB]

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype). Abundant. Sep–Oct.

Callahan 650 (NCSC); *Callahan 651* (NCSC).

3. ARISTIDA L.

Aristida stricta Michx. [<*A. stricta*–RAB]

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype). Abundant. Sep–Nov.

Callahan 463 (NCSC); *Callahan 464* (NCSC); *Callahan 465* (NCSC).

Aristida tuberculosa Nutt. [=RAB]

Pine/Scrub Oak Sandhill. Occasional. Aug–Oct.

Callahan 466 (NCSC); *Callahan 467*(NCSC).

4. ARUNDINARIA Michx.

Arundinaria gigantea (Walter) Muhl. [<*A. gigantea*–RAB]

Arundo gigantea Walter

Coastal Plain Small Stream Swamp; Black Water Bottomland Hardwoods (High Subtype). Frequent. Apr–Jun.

Callahan 685 (NCSC).

Arundinaria tecta (Walter) Muhl. [<*A. gigantea*–RAB]

Arundo tecta Walter

Streamhead Pocosin. Frequent. Apr–Jul

Callahan 682 (NCSC).

5. CHASMANTHIUM Link

Chasmanthium laxum (L.) H.O. Yates [=*Uniola laxa* (L.) Britton, Sterns, & Poggenburg–RAB]

Holcus laxus L.

Black Water Bottomland Hardwoods (High Subtype); Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype). Occasional. Jun–Oct.

Callahan 673 (NCSC); *Callahan 674* (NCSC).

5. COLEATAENIA Griseb.

Coleataenia anceps (Michx.) Soreng ssp. ***anceps*** [=*Panicum anceps* var. *anceps*–RAB]

Panicum anceps Michx.

Pine/Scrub Oak Sandhill; Roadside and disturbed areas. Occasional. Jun–Oct.

Callahan 672 (NCSC).

6. DANTHONIA DC.

Danthonia sericea Nutt. [=*D. sericea* var. *sericea*–RAB]

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype). Occasional. Apr–Jun

Callahan 469 (NCSC); *Callahan 470* (NCSC).

7. DICHANTHELIUM (Hitchc. & Chase) Gould.

Dichanthelium aciculare (Desv. ex Poir.) Gould & C.A. Clark [=*Panicum aciculare*–RAB]

Panicum aciculare Desv. ex Poir.

Cypress Savanna (Acid Subtype); Pine/Scrub Oak Sandhill. Frequent. May–Oct.

Callahan 729 (NCSC)

Dichanthelium acuminatum (Sw.) Gould & C.A. Clark var. ***acuminatum*** [< *Panicum lanuginosum* Elliott–RAB]

Panicum acuminatum Sw.

Cypress Savanna (Acid Subtype); Roadsides and disturbed areas. Frequent. May–Oct.

Callahan 727 (NCSC)

Dichanthelium acuminatum (Sw.) Gould & C.A. Clark var. ***fasciculatum*** Torr. [<*Panicum lanuginosum* Elliott–RAB]

Panicum acuminatum Sw.

Cypress Savanna (Acid Subtype); Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype); Roadsides and disturbed areas. Frequent. May–Aug

Callahan 725 (NCSC); *Callahan 728* (NCSC)

Dichanthelium erectifolium (Nash) Gould & C.A. Clark [=*Panicum erectifolium*–RAB]

Panicum erectifolium Nash

W1; S2,G4; Cypress Savanna (Typic Subtype); Pine/Scrub Oak Sandhill. Occasional. May–Aug

Callahan 726 (NCSC)

Dichanthelium longiligulatum (Nash) Freckmann [=*Panicum longiligulatum*–RAB]

Panicum longiligulatum Nash

Cypress Savanna (Typic Subtype). Occasional. May–Sep

Callahan 723 (NCSC)

Dichanthelium wrightianum (Scribn.) Freckmann [=*Panicum wrightianum*–RAB]

Panicum wrightianum Scribn.

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Pine/Scrub Oak Sandhill. Frequent. May–Sep.

Callahan 722 (NCSC); *Callahan 724* (NCSC)

8. ERAGROSTIS Wolf

Eragrostis curvula (Schrad.) Nees [=RAB]

Poa curvula Schrad.

Roadsides and disturbed areas. Infrequent. May–Jun

Callahan 678 (NCSC); *Callahan 679* (NCSC).

Eragrostis refracta (Muhl.) Scribn. [=RAB]

Poa refracta Scribn.

Reported on site (LeBlond 2007). Pine/Scrub Oak Sandhill; Streamhead pocoson. Frequent. Jul–Oct.

Eragrostis spectabilis (Pursh) Steud. [=RAB]

Poa spectabilis Pursh.

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype); Roadsides and disturbed areas. Frequent. Aug–Oct.

Callahan 676 (NCSC); *Callahan 677* (NCSC).

9. ERIANTHUS Michx.

Erianthus brevibarbis Michx. [=RAB]

Cypress Savanna (Acid Subtype); Drainage ditches. Occasional. Sep–Oct.

Callahan 652 (NCSC).

10. FESTUCA L.

Festuca sciurea Nutall [=RAB]

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype); Roadsides and disturbed areas. Occasional. Apr–May

Callahan 681 (NCSC).

11. LEERSIA Sw.

Leersia hexandra Sw. [=RAB]

Coastal Plain Semipermanent Impoundment. Frequent. Jun–Aug.
Seen on site by present author. No collection made.

Leersia oryzoides Sw. [=RAB]

Coastal Plain Semipermanent Impoundment. Frequent. Jun–Aug.

Vicinity: *Walters s.n.* (NCSC).

12. MNESITHEA Kunth.

Mnesithea rugosa (Nutt.) de Koning & Sosef [=*Manisuris rugosa* (Nutt.) Kuntze–RAB]

Rottboellia rugosa Nutt.

Cypress Savanna (Typic Subtype). Infrequent. Jun–Oct.

Callahan 462 (NCSC).

13. PANICUM L.

Panicum verrucosum Muhl. [=RAB]

Reported on site (LeBlond 2007). Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype). Occasional. Aug–Oct.

Panicum virgatum L. var. ***cubense*** Griseb. [<*P. virgatum*–RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype). Occasional. Jun–Oct.

Callahan 669 (NCSC); *Callahan 670* (NCSC).

Panicum virgatum L. var. ***virgatum*** [<*P. virgatum*–RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype) Pine/Scrub Oak Sandhill. Frequent. Jun–Oct.

Callahan 671 (NCSC).

14. PASPALUM L.

****Paspalum notatum*** Flüggé [>*P. notatum* var. *saurae* Parodi–RAB]

Roadsides and disturbed areas. Frequent. Jun–Oct.

Callahan 675 (NCSC).

15. PHYLLOSTACHYS Seibold & Zucc.

Phyllostachys aurea Carrière ex Rivière & C. Rivière [=RAB]

Bamboo stand. Rare. Not known to flower on site.

Callahan 1 (NCSC).

16. SORGHASTRUM Nash

Sorghastrum nutans (L.) Nash [=RAB]

Andropogon nutans L.

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype); Roadsides and disturbed areas. Frequent. Aug–Oct.

Callahan 468 (NCSC).

SMILACACEAE

1. SMILAX L.

Smilax glauca Walter [=RAB]

Streamhead Pocosin; Nonriverine Swamp Forest (Mixed Subtype); Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Pine Plantation; Mesic Pine Savanna (Coastal Plain Subtype; Dry Oak Hickory Forest (Coastal Plain Subtype). Frequent. Apr–Jun; Sep–Nov.

Callahan 27 (NCSC); *Callahan 206* (NCSC); *Callahan 362* (NCSC).

Smilax laurifolia L. [=RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Small depression Pocosin (Typic Subtype). Occasional. Jul–Aug; Sep–Oct.

Callahan 211 (NCSC); *Callahan 275* (NCSC); *Callahan 312* (NCSC); *Callahan 395* (NCSC).

Smilax rotundifolia L. [=RAB]

Streamhead Pocosin; Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Pine Plantation; Mesic Pine Savanna (Coastal Plain Subtype); Dry Oak Hickory Forest (Coastal Plain Subtype). Frequent. Apr–May; Sep–Nov.

Callahan 209 (NCSC); *Callahan 210* (NCSC); *Callahan 276* (NCSC); *Callahan 282* (NCSC); *Callahan 282* (NCSC); *Callahan 394* (NCSC).

Smilax walteri Pursh [=RAB]

Not seen on site by present author. Reported on site (LeBlond 2007). Cypress Savanna (Acid Subtype). Apr–May; Sep–Nov.

TYPHACEAE

1. TYPHA L.

Typha latifolia L. [=RAB]

Seen on site by present author. Coastal Plain Semipermanent Impoundment (Typic Marsh Subtype). Infrequent. May–Jul.

XYRIDACEAE

1. XYRIS Gronov. ex L.

Xyris ambigua Beyr. ex Kunth [=RAB]

Drainage ditches. Occasional. Jun–Aug.

Callahan 364(NCSC); *Callahan 365*(NCSC); *Callahan 366*(NCSC); *Callahan 367*(NCSC).

Xyris caroliniana Walter [=RAB]

Cypress Savanna (Typic Subtype); Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype). Occasional. Jun–Jul

Callahan 368 (NCSC); *Callahan 369* (NCSC); *Callahan 370* (NCSC); *Callahan 372* (NCSC); *Callahan 373* (NCSC).

Vicinity: *Wilbur 81052* (DUKE).

Xyris difformis Chapm. [<*X. difformis*–RAB]

Cypress Savanna (Typic Subtype); Drainage ditches. Occasional. Aug–Oct.

Callahan 342(NCSC); *Callahan 344* (NCSC); *Callahan 375* (NCSC).

Xyris jupicai Rich. [=RAB]

Drainage ditches. Occasional. Jul–Sep.

Callahan 343 (NCSC); *Callahan 345* (NCSC); *Callahan 346* (NCSC); *Callahan 347* (NCSC); *Callahan 348* (NCSC); *Callahan 349* (NCSC); *Callahan 376* (NCSC).

Xyris platylepsis Chapm. [=RAB]

Cypress Savanna (Typic Subtype); Drainage ditches. Infrequent. Jul–Sep.

Callahan 374 (NCSC).

EUDICOTS

ALTINGIACEAE

1. LIQUIDAMBAR L.

Liquidambar styraciflua L. [=RAB]

Black Water Bottomland Hardwoods (High Subtype); Coastal Plain Small Stream Swamp. Frequent. Apr–May; Aug–Sep.

Callahan 51 (NCSC).

ANACARDIACEAE

1. RHUS L.

Rhus copallinum L. var. ***copallinum*** [<*R. copallina*–RAB]

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype); Roadsides and disturbed areas. Frequent. Jul–Sep; Aug–Oct.

Callahan 62 (NCSC); *Callahan 63* (NCSC).

1. TOXICODENDRON Mill.

Toxicodendron pubescens L. [=*Rhus toxicodendron* L.–RAB]

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype); Pine Plantations; Roadsides and disturbed areas. Frequent. Late Apr–May; Aug–Oct.

Callahan 16 (NCSC).

Toxicodendron radicans (L.) Kuntze var. ***radicans*** [<*Rhus radicans* L.–RAB]

Rhus radicans L.

Black Water Bottomland Hardwoods (High Subtype); Pinus taeda woodland. Occasional. Late Apr–May; Aug–Oct.

Callahan 719 (NCSC).

Toxicodendron vernix (L.) Kuntze [=*Rhus vernix*–RAB]

Rhus vernix L.

Streamhead Pocosin. Rare. May–Jun; Aug–Sep.

Callahan 319 (NCSC).

APIACEAE

1. ANGELICA L.

Angelica venenosa (J. Greenway) Fernald [=RAB]

Cicuta venenosa J. Greenway

Pine/Scrub Oak Sandhill. Rare. May–Aug; Jul–Sep.

Callahan 339 (NCSC).

2. CENTELLA L.

Centella asiatica (L.) Urban [=RAB]

Hydrocotyle asiatica L.

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype). Frequent. Jun–Aug; Jul–Sep.

Callahan 288 (NCSC).

APOCYNACEAE

1. ASCLEPIAS L.

Asclepias amplexicaulis Sm. [= RAB]

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype); Roadsides and disturbed areas. Rare. May–Jul; Jun–Aug.

Callahan 29 (NCSC); *Callahan 39* (NCSC).

Asclepias tuberosa L. var. ***rolfsii*** (Britton ex Vail) Shinners [=*A. tuberosa* ssp. *rolfsii* (Britton ex Vail) Woodson–RAB]

Asclepias rolfsii Britton ex Vail

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype); Roadsides and disturbed areas. Rare. May–Aug; Aug–Sep.

Callahan 19 (NCSC).

Asclepias variegata L. [=RAB]

Roadsides and disturbed areas. Rare. May–Jul; July–Sep.

Callahan 315 (NCSC).

AQUIFOLIACEAE

1. ILEX L.

Ilex coriacea (Pursh) Chapm. [=RAB]

Prinos coriaceus Pursh

Cypress Savanna (Acid Subtype); Cypress Savanna (Acid Subtype); Streamhead Pocosin; Streamhead Atlantic White Cedar Forest; Small Depression Pocosin (Typic Subtype); Pinus Teada Woodland; Pine Plantation. Abundant. Apr–May; Sep–Oct.

Callahan 57 (NCSC).

Ilex glabra (L.) A. Gray [=RAB]

Prinos glaber L.

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Streamhead Pocosin; Streamhead Atlantic White Cedar Forest; Small Depression Pocosin (Typic Subtype); Pinus Teada Woodland; Pine Plantation. Abundant. May–Jun; Sep–Nov.

Callahan 35 (NCSC).

Ilex opaca Aiton [<*I. opaca*–RAB]

Black Water Bottomland Hardwoods (High Subtype); Coastal Plain Small Stream Swamp; Dry Oak Hickory Forest (Coastal Plain Subtype). Frequent. Apr–Jun; Sep–Oct.

Callahan 65 (NCSC).

ARALIACEAE

1. ARALIA L.

Aralia spinosa L. [=RAB]

Streamhead Pocosin. Infrequent. Jun–Sep.

Callahan 64 (NCSC).

2. HYDROCOTYLE L.

Hydrocotyle sp.

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype). Frequent.

Callahan 174 (NCSC).

ASTERACEAE

1. AMBROSIA L.

Ambrosia artemisiifolia L. [=RAB]

Cypress Savanna (Acid Subtype); Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Frequent. Aug–Nov.

Callahan 293 (NCSC).

2. ARNICA L.

Arnica acaulis (Walter) Britton, Sterns & Poggenb. [=RAB]

Not seen on site by present author. Expected in Pine/Scrub Oak sandhill and other sandy areas (Weakley 2015). Mar–Jun.

Vicinity: *Ahles 24663* (NCU).

3. BACCHARIS L.

Baccharis halimifolia L. [=RAB]

Seen on site by present author. Roadsides and disturbed areas. Aug–Oct.

4. CHRYSOPSIS (Nutt.) Elliott

Chrysopsis gossypina (Michx.) Elliott [<*Heterotheca gossypina* (Michx.) Shinners–RAB]

Inula gossypina Elliott

Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. F.

Callahan 430 (NCSC); *Callahan 431* (NCSC); *Callahan 432*(NCSC); *Callahan 433* (NCSC).

5. CIRSIUM Mill.

Cirsium repandum Michx. [=*Carduus repandus* (Michx.) Pers.–RAB]

Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Occasional. May–Jul

Callahan 37 (NCSC); *Callahan 695* (NCSC).

6. CONYZA Raf.

Conyza canadensis L. [=RAB]

Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Frequent. Jul–Nov.

Callahan 646(NCSC).

7. COREOPSIS L.

Coreopsis linifolia Nutt. [=*C. angustifolia* Aiton–RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Drainage ditches. Occasional. Jul–Oct.

Callahan 654 (NCSC); *Callahan 655* (NCSC); *Callahan 656* (NCSC).

8. CROPTILON Raf.

Croptilon divaricatum (Nutt.) Raf. [=*Haplopappus divaricatus* (Nuttall) A. Gray–RAB]

Inula divaricata Nutt.

Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Frequent. Aug–Nov.

Callahan 660 (NCSC); *Callahan 661* (NCSC); *Callahan 662* (NCSC); *Callahan 663* (NCSC).

9. ELEPHANTOPUS L.

Elephantopus nudatus A. Gray [=RAB]

Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Frequent. Jul–Sep.

Callahan 423 (NCSC); *Callahan 708* (NCSC); *Callahan 709* (NCSC).

10. ERECHTITES Raf.

Erechtites hieraciifolius (L.) Raf. ex DC. [=*E. hieracifolia*–RAB]

Senecio hieraciifolius L.

Roadsides and disturbed areas. Frequent. Jul–Nov.

Callahan 664 (NCSC).

11. EUPATORIUM L.

Eupatorium capillifolium (Lam.) Small ex Porter & Britton [=*E. capillifolium* var. *capillifolium*–RAB]

Artemesia capillifolium Lam.

Roadsides and disturbed areas. Occasional. Sep–Nov.

Callahan 687 (NCSC).

Eupatorium compositifolium Walter [=RAB]

Cypress Savanna (Typic Subtype); Roadsides and disturbed areas. Occasional. Sep–Dec.

Callahan 471 (NCSC); *Callahan 472* (NCSC); *Callahan 474* (NCSC).

Eupatorium glaucescens Elliott [<*E. cuneifolium* Willd.–RAB]

Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Occasional. Jul–Oct.

Callahan 443 (NCSC); *Callahan 445* (NCSC).

Eupatorium hyssopifolium L. [<*E. hyssopifolium*–RAB]

Reported on site (LeBlond 2007). Cypress Savanna (Acid Subtype); Roadsides and disturbed areas. Occasional. Jul–Oct.

Eupatorium leucolepis (DC.) Torr. & A. Gray [<*E. leucolepis*–RAB]

Eupatorium glaucescens var. *leucolepis* DC.

Cypress Savanna (Typic Subtype). Infrequent. Aug

Callahan 442 (NCSC).

Eupatorium pilosum Walter [=RAB]

Cypress Savanna (Typic Subtype). Occasional. Aug–Oct.

Callahan 441 (NCSC).

Eupatorium resinosum Small [<*E. recuvans*–RAB]

SR-O; S3, G3. Reported Pine/Scrub Oak Sandhill and Roadsides and disturbed areas (LeBlond 2007). Aug–Oct.

Eupatorium recurvans Small [<*E. recuvans*–RAB]

Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Infrequent. Aug–Oct.

Callahan 446 (NCSC).

12. EURYBIA (Cass.) Cass.

Eurybia paludosa (Aiton) G.L. Nesom [=*Aster paludosa*–RAB]

Aster paludosa Aiton

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Streamhead Pocosin. Occasional. Jul–Oct.

Callahan 448 (NCSC).

13. GAMOCHAETA Wedd.

Gamochaeta argyrinea G.L. Nesom [<*Gnaphalium purpureum* L. var. *purpureum*–RAB]

Roadsides and disturbed areas. Occasional. Mar–Jul.

Callahan 478 (NCSC).

Gamochaeta coarctata (Willd.) Kerguélen [<*Gnaphalium purpureum* var. *americanum* (P. Miller) Klatt–RAB, misapplied]

Gnaphalium coarctatum Willd.

Roadsides and disturbed areas. Occasional. Mar–Jul.

Callahan 475 (NCSC).

Gamochaeta purpurea (L.) Cabrera [<*Gnaphalium purpureum* var. *purpureum*–RAB]

Gnaphalium purpureum L.

Roadsides and disturbed areas. Occasional. Mar–Sep.

Callahan 477(NCSC).

14. HELIANTHUS L.

Helianthus atrorubens L. [=RAB]

Pine/Scrub Oak Sandhill; Pine Plantation; Roadsides and disturbed areas. Occasional. Jul–Oct.

Callahan 666 (NCSC); *Callahan 667* (NCSC).

15. HYPOCHAERIS L.

***Hypochaeris glabra** L. [=*Hypochoeris glabra*–RAB]

Roadsides and disturbed areas. Occasional. Mar–Jul

Callahan 658 (NCSC).

***Hypochaeris radicata** L. [=*Hypochoeris radicata*–RAB]

Roadsides and disturbed areas. Occasional. Apr–Oct.

Callahan 659 (NCSC).

16. IONACTIS L.

Ionactis linariifolia (L.) Greene [=*Aster linariifolius* L.–RAB]

Aster linariifolia L.

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype); Roadsides and disturbed areas. Occasional. Jul–Nov.

Callahan 645 (NCSC).

17. KRIGIA Schreb.

Krigia virginica (L.) Willd. [=RAB]

Hyoseris virginica L.

Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Frequent. Mar–Jul.

Callahan 697 (NCSC); *Callahan 698* (NCSC); *Callahan 699* (NCSC).

18. LIATRIS Gaertn. ex Schreb.

Liatris pilosa (Aiton) Willd. [=*Liatris graminifolia* Willd.–RAB]

Serratula pilosa Aiton

Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Occasional. Sep–Oct.

Callahan 718 (NCSC).

19. MIKANIA Willd.

Mikania scandens (L.) Willd. [=RAB]

Eupatorium scandens L.

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Streamhead Pocosin. Occasional. Jul–Oct.

Callahan 331 (NCSC).

20. PACKERA Á. Löve & D. Löve

Packera anonyma (Alph. Wood) W.A. Weber & Á. Löve [=*Senecio smallii* Britton–RAB]

Senecio anonymus Alph. Wood

Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Frequent. May–Jun

Callahan 701 (NCSC); *Callahan 702* (NCSC); *Callahan 703* (NCSC).

21. PITYOPSIS Nutt.

Pityopsis graminifolia (Michx.) Nutt. var. ***latifolia*** Fernald [=RAB]

Inula graminifolia Michx.

Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Frequent. Jun–Oct.

Callahan 437 (NCSC); *Callahan 438* (NCSC); *Callahan 439* (NCSC); *Callahan 440* (NCSC); *Callahan 441* (NCSC).

22. PSEUDOGNAPHALIUM Kirp.

Pseudognaphalium obtusifolium (L.) Hilliard & B.L. Burtt [=*Gnaphalium obtusifolium* L.–RAB]

Gnaphalium obtusifolium L.

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype)Subtype); Roadsides and disturbed areas. Occasional. Aug–Nov.

Callahan 479 (NCSC).

23. SERICOCARPUS Nees

Sericocarpus asteroides (L.) Britton, Sterns, & Poggenb. [=*Aster paternus* Cronq.–RAB]

Conyza asteroides L.

Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Frequent. Jun–Jul.

Callahan 657 (NCSC); *Callahan 714* (NCSC); *Callahan 715* (NCSC); *Callahan 716* (NCSC).

Sericocarpus tortifolius (Michx.) Nees [=*Aster tortifolius*–RAB]

Aster tortifolius Michx.

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype); Roadsides and disturbed areas. Frequent. Jun–Jul

Callahan 711(NCSC); *Callahan 712*(NCSC); *Callahan 713*(NCSC); *Callahan 717*(NCSC).

24. SILPHIUM L.

Silphium compositum Michx. var. ***compositum*** [=RAB]

Pine/Scrub Oak Sandhill. Occasional. May–Sep.

Callahan 665 (NCSC).

25. SOLIDAGO L.

Solidago fistulosa Mill. [=RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype). Infrequent. Aug–Nov.

Callahan 644 (NCSC).

Solidago gracillima Torr. & A. Gray [< *Solidago gracillima*–RAB]

W1; S3,G4. Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype). Infrequent. Aug–Oct.

Callahan 643 (NCSC).

Solidago odora Aiton [=RAB]

Pine/Scrub Oak Sandhill; Mesic Pine Savanna (Coastal Plain Subtype); Roadsides and disturbed areas. Frequent. Jul–Oct.

Callahan 642 (NCSC).

26. SYMPHYOTRICHUM Nees

Symphyotrichum dumosum (L.) G.L. Nesom var. ***dumosum*** [=*Aster dumosus*–RAB]

Aster dumosus L.

Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Frequent. Aug–Oct.

Callahan 647 (NCSC); *Callahan 648* (NCSC); *Callahan 649* (NCSC).

27. VERNONIA Schreb.

Vernonia angustifolia Michx. [=RAB]

Pine/Scrub Oak Sandhill. Roadsides and disturbed areas. Frequent. Jun–Sep; Sep–Oct.

Callahan 700 (NCSC).

BIGNONIACEAE

1. CAMPSIS Lour.

Campsis radicans (L.) Bureau [=RAB]

Bignonia radicans L.

Black Water Bottomland Hardwoods (High Subtype); Streamhead Pocosin; Pine Plantation. Occasional. Jun–Jul; Sep–Oct.

Callahan 214 (NCSC).

BRASSICACEAE

1. CARDAMINE L.

***Cardamine hirsuta** L. [=RAB]

Roadsides and disturbed areas. Infrequent. Jan–May

Callahan 6 (NCSC).

2. TEESDALIA W.T. Aiton

***Teesdalia nudicaulis** (L.) W.T. Aiton [=RAB]

Iberis nudicaulis L.

Pine/Scrub Oak Sandhill. Roadsides and disturbed areas. Occasional. Mar–Apr; Apr–Jun.

Callahan 25 (NCSC).

CACTACEAE

1. OPUNTIA Mill.

Opuntia sp.

Pine/Scrub Oak Sandhill. Infrequent.

Callahan 40 (NCSC).

CAMPANULACEAE

1. LOBELIA L.

Lobelia canbyi A. Gray [=RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Drainage ditches; Streamhead Pocosin. Frequent. Jul–Nov.

Callahan 263 (NCSC); *Callahan 358* (NCSC).

Lobelia nuttallii Roem. & Schult. [=RAB]

Drainage ditches; Mesic Pine Savanna (Coastal Plain Subtype). Occasional. May–Nov.

Callahan 18 (NCSC); *Callahan 49* (NCSC).

2. TRIODANIS Raf.

Triodanis perfoliata (L.) Nieuwl. [=*Specularia perfoliata* (L.) A. DC.–RAB]

Campanula perfoliata L.

Pine/Scrub Oak Sandhill; Pine Plantations; Roadsides and disturbed areas. Infrequent. Apr–Jun.

Callahan 150 (NCSC).

3. WAHLENBERGIA Schrad. ex Roth

****Wahlenbergia marginata*** (Thunb.) A. DC. [=RAB]

Campanula marginata Thunb.

Roadsides and disturbed areas. Infrequent. Feb–Dec.

Callahan 123 (NCSC).

CAPRIFOLIACEAE

1. LONICERA L.

****Lonicera japonica*** Thunb. [=RAB]

Black Water Bottomland Hardwoods (High Subtype); Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations; Streamhead Pocosin. Frequent. Apr–Jun; Aug–Oct.

Callahan 15 (NCSC).

Lonicera sempervirens L. [=RAB]

Black Water Bottomland Hardwoods (High Subtype); Pine Plantations. Infrequent. Apr–Jun; Aug–Oct.

Callahan 66 (NCSC).

CARYOPHYLLACEAE

1. CERASTIUM L.

Cerastium glomeratum Thuill. [=RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Occasional. Mar–May.

Callahan 476 (NCSC).

Vicinity: *Wilbur 5203* (DUKE).

3. STELLARIA L.

Stellaria media (L.) Vill. [=RAB]

Alsine media L.

Roadsides and disturbed area. Occasional. Jan–Dec.

Callahan 403 (NCSC).

3. STIPULICIDA Michx.

Stipulicida setacea Michx. [<*S. setacea*–RAB]

Pine/Scrub Oak Sandhill; Roadsides and disturbed area. Occasional. May–Aug.

Callahan 67 (NCSC); *Callahan 175* (NCSC).

CISTACEAE

1. CROCANTHEMUM Spach

Crocanthemum canadense (L.) Britton [=*Helianthemum canadense* (L.) Michx.–RAB]

Cistus canadensis L.

Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Occasional. Apr–May (Chasm.), May–Aug (Cleist.); Jun–Oct.

Callahan 68 (NCSC); *Callahan 171* (NCSC).

***Crocanthemum carolinianum* (**Walter) Spach [=*Helianthemum carolinianum* (Walter) Michx.–RAB]

Cistus carolinianus Walter

State E; S1, G4. Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Rare. Apr–May; Jul–Aug.

Callahan 200 (NCSC); *Callahan 295* (NCSC)

2. LECHEA L.

Lechea minor L. [=RAB]

Pine/Scrub Oak Sandhill; Roadsides and disturbed area. Occasional. Jul–Aug; Aug–Oct.

Callahan 299 (NCSC).

Lechea mucronata Raf. [=*L. villosa* Elliott–RAB]

Pine/Scrub Oak Sandhill; Roadsides and disturbed area. Occasional. Jun–Aug; Jul–Oct.

Callahan 274 (NCSC); *Callahan 292* (NCSC).

Lechea racemulosa Michx. [=RAB]

Pine/Scrub Oak Sandhill; Roadsides and disturbed area. Occasional. Jun–Aug; Jul–Oct.

Callahan 291 (NCSC); *Callahan 300* (NCSC).

CLETHRACEAE

1. CLETHRA L.

Clethra alnifolia L. [=*C. alnifolia* var. *alnifolia*–RAB]

Black Water Bottomland Hardwoods (High Subtype); Coastal Plain Small Stream Swamp; Drainage ditches; Small depression Pocosin (Typic Subtype); Streamhead Pocosin; Frequent. Jun–Aug; Sep–Oct.

Callahan 52 (NCSC); *Callahan 69* (NCSC); *Callahan 70* (NCSC).

CONVOLVULACEAE

1. IPOMOEA L.

Ipomoea pandurata (L.) G. Mey [=RAB]

Convolvulus panduratus L.

Pine/Scrub Oak Sandhill; Roadsides and disturbed area. Occasional. May–Sep: Jul–Oct.

Callahan 124 (NCSC); *Callahan 130* (NCSC).

2. STYLISMA Raf.

Stylisma patens (Desr.) Myint [=*Bonamia patens* (Desr.) Shinners var. *patens*–RAB]

Convolvulus patens Desr.

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Roadside and disturbed areas. Frequent. Jun–Aug.

Callahan 201 (NCSC); *Callahan 266* (NCSC).

CORNACEAE

1. CORNUS L.

Cornus florida L. [=RAB]

Dry Oak Hickory Forest (Coastal Plain Subtype); Mesic Pine Savanna (Coastal Plain Subtype); Pine plantations. Infrequent. Mar–May; Sep–Oct.

Callahan 13 (NCSC); *Callahan 32* (NCSC); *Callahan 72* (NCSC); *Callahan 328* (NCSC).

CYRILLACEAE

1. CYRILLA Garden

Cyrilla racemiflora L. [=RAB]

Drainage ditches; Small depression Pocosin (Typic Subtype); Streamhead Pocosin. Abundant. May–Jul; Sep–Oct.

Callahan 44 (NCSC).

DROSERACEAE

1. DROSERA L.

Drosera capillaris Poir. [=RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Drainage ditches. Occasional. May–Aug.

Callahan 320 (NCSC); *Callahan 321* (NCSC).

Drosera intermedia Hayne [=RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Drainage ditches. Occasional. Jul–Sep.

Callahan 74 (NCSC).

EBENACEAE

Diospyros virginiana L [=RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations. Abundant. May–Jun; Sep–Dec.

Callahan 385b (NCSC).

ERICACEAE

1. CHIMAPHILA Pursh

Chimaphila maculata (L.) Pursh [=RAB]

Pyrola maculata L.

Dry Oak Hickory Forest (Coastal Plain Subtype); Pine Plantation. Infrequent. May–Jun; Jul–Oct.

Callahan 78 (NCSC).

2. EUBOTRYS Nutt.

Eubotrys racemosus (L.) Nutt. [=*Leucothoe racemosa* (L.) A. Gray–RAB]

Andromeda racemosa L.

Drainage Ditches; Small depression Pocosin (Typic Subtype); Streamhead Pocosin. Occasional. Mar–Jun; Sep–Oct.

Callahan 77 (NCSC); *Callahan 79* (NCSC).

3. GAYLUSSACIA Kunth

Gaylussacia dumosa (Andrews) A. Gray [<*G. dumosa*–RAB]

Vaccinium dumosa Andrews

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations. Abundant. Mar–Jun; Jun–Oct.

Callahan 38 (NCSC); *Callahan 59* (NCSC); *Callahan 84* (NCSC).

Gaylussacia frondosa (L.) Torr. & A. Gray [=*G. frondosa* var. *frondosa*–RAB]

Vaccinium frondosum L.

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations; Streamhead Pocosin. Frequent. Mar–May; Jun–Aug.

Callahan 81 (NCSC).

4. KALMIA L.

Kalmia carolina Small [=*K. angustifolia* L. var. *caroliniana* (Small) Fernald–RAB]

Drainage Ditches; Streamhead Pocosin. Occasional. Apr–May; Sep–Oct.

Callahan 58 (NCSC); *Callahan 82* (NCSC).

Kalmia latifolia L. [=RAB]

Not seen at PBP by present author. Expected in streamhead pocosins and acidic forests (Weakley 2015). Apr–Jul; Sep–Oct.

Grant s.n. (NCU).

5. LEUCOTHOE D. Don

Leucothoe axillaris (Lam.) D. Don [=*L. axillaris* var. *axillaris*–RAB]

Andromeda axillaris Lam.

Black Water Bottomland Hardwoods (High Subtype); Streamhead Pocosin. Infrequent. Mar–May; Sep–Oct.

Callahan 56 (NCSC).

6. LYONIA Nutt.

Lyonia ligustrina (L.) DC. var. ***foliosiflora*** (Michx.) Fernald [<*L. ligustrina*–RAB]

Andromeda paniculata var. foliosiflora Michx.

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Drainage ditches; Streamhead Pocosin. Occasional. Apr–Jun; Sep–Oct.

Callahan 268 (NCSC).

Lyonia lucida **(**Lam.) K. Koch [=RAB]

Andromeda lucida Lam.

Coastal Plain Small Stream Swamp; Drainage ditches; Streamhead Pocosin. Abundant. Feb–Jun; Sep–Oct.

Callahan 318 (NCSC).

Lyonia mariana **(**L.) D. Don [=RAB]

Andromeda mariana L.

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Drainage ditches; Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Streamhead Pocosin. Frequent. Apr–May; Sep–Oct.

Callahan 41 (NCSC); *Callahan 55* (NCSC); *Callahan 60* (NCSC); *Callahan 80* (NCSC); *Callahan 89* (NCSC).

7. OXYDENDRUM DC.

Oxydendrum arboreum (L.) DC. [=RAB]

Andromeda arborea L.

Seen on site by present author. No specimen collected. Dry Oak Hickory Forest (Coastal Plain Subtype). Occasional. Jun–Jul; Sep–Oct.

8 RHODODENDRON L.

Rhododendron atlanticum (Ashe) Rehder [=RAB]

Azalia atlantica Ashe

Pine/Scrub Oak Sandhill. Frequent. Apr–May; Aug–Oct.

Callahan 198 (NCSC); *Callahan 294* (NCSC).

Rhododendron viscosum (L.) Torr. var. ***serrulatum*** (Small) H.E. Ahles [=RAB]

Azalea viscosa Torr.

Streamhead Pocosin. Occasional. May–Jun; Jul–Oct.

Callahan 15 (NCSC); *Callahan 34* (NCSC).

9. VACCINIUM L.

Vaccinium arboreum Marshall [=RAB]

Dry Oak Hickory Forest (Coastal Plain Subtype); Pine Plantations. Infrequent. Apr–Jun; Sep–Oct.

Callahan 85 (NCSC).

Vaccinium crassifolium Andrews [=RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations. Frequent. Apr–May; Jun–Jul.

Callahan 9 (NCSC).

Vaccinium formosum Andrews [<*V. corymbosum*–RAB]

Black Water Bottomland Hardwoods (High Subtype); Cypress Savanna (Typic Subtype); Drainage ditches; Streamhead Pocosin. Frequent. Feb–May; Jun–Aug.

Callahan 54 (NCSC); *Callahan 88* (NCSC).

Vaccinium fuscatum Aiton [=*V. atrococcum* (A. Gray) A. Heller–RAB]

Cypress Savanna (Typic Subtype); Cypress Savanna (Typic Subtype); Drainage ditches; Small depression Pocosin (Typic Subtype); Streamhead Pocosin. Frequent. Feb–May; Jun–Aug.

Callahan 7 (NCSC); *Callahan 61* (NCSC).

Vaccinium stamineum L. var. ***stamineum*** [=RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations. Occasional. Apr–Jun; Aug–Oct.

Callahan 83 (NCSC); *Callahan 87* (NCSC).

Vaccinium tenellum Aiton [=RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations. Frequent. Mar–May; Jun–Jul.

Callahan 10 (NCSC).

EUPHORBIA

1. CNIDOSCOLUS Pohl

Cnidoscolus stimulosus (Michx.) Engelm. & A. Gray [=RAB]

Jatropha stimulosa Michx.

Pine/Scrub Oak Sandhill. Frequent. Mar–Aug; May–Sep.

Callahan 20 (NCSC).

2. EUPHORBIA L.

Euphorbia curtisii Engelm. ex Chapm. [=RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations. Occasional. Mar–Jun.

Callahan 98 (NCSC).

Euphorbia ipecacuanhae L. [=RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations. Occasional. Feb–May.

Callahan 14 (NCSC); *Callahan 202* (NCSC).

Euphorbia pubentissima Michx. [>*E. corollata* L. var. *zinniiflora* (Small) H.E. Ahles–RAB; >< *E. corollata* L. var. *corollata*–RAB, in part]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations. Frequent. Mar–Jul.

Callahan 11 (NCSC); *Callahan 26* (NCSC); *Callahan 97* (NCSC); *Callahan 99* (NCSC); *Callahan 280* (NCSC); *Callahan 306* (NCSC).

Vicinity: *Wilbur 5201* (DUKE).

FABACEAE

1. ALBIZIA Durazz.

****Albizia julibrissin*** Durazz. [=RAB]

Pine/Scrub Oak Sandhill; Pine Plantations; Roadside and disturbed area. Occasional. May–Aug; Jul–Nov.

Callahan 96 (NCSC).

2. AMORPHA L.

Amorpha herbacea Walter var. ***herbacea*** [<*Amorpha herbacea*–RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill. Frequent. May–Jul; Jul–Oct.

Callahan 131 (NCSC); *Callahan 135* (NCSC); *Callahan 137*(NCSC).

3. ASTRAGALUS L.

Astragalus michauxii (Kuntze) F.J. Herm. [=RAB]

Tragacantha michauxii Kuntze

State SC-V; S3, G3. Pine/Scrub Oak Sandhill; Roadside and disturbed areas. Rare. Apr–Jun; Jun–Oct.

Callahan 136 (NCSC).

4. BAPTISIA Vent.

Baptisia cinerea (Raf.) Fernald & B.G. Schub. [=RAB]

Lasinia cinerea Raf.

Pine/Scrub Oak Sandhill; Roadside and disturbed areas. Frequent. Apr–Jun; Jun–Jul.

Callahan 24 (NCSC).

5. CERCIS L.

Cercis canadensis L. var. ***canadensis*** [<*C. canadensis*–RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Roadside and disturbed areas. Infrequent. Mar–May; Jun–Nov.

Callahan 285 (NCSC).

6. CHAMAECRISTA Moench

Chamaecrista nictitans (L.) Moench var. ***nictitans*** [<*Cassia nictitans*–RAB]

Cassia nictitans L.

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Roadside and disturbed areas. Occasional. Jun–Oct.; Jul–Nov.

Callahan 94 (NCSC).

7. CLITORIA L.

Clitoria mariana L. var. ***mariana*** [<*C. mariana*–RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Roadside and disturbed areas. Frequent. Jun–Aug; Jul–Oct.

Callahan 132 (NCSC); *Callahan 134* (NCSC).

8. DESMODIUM Desv.

Desmodium glabellum (Michx.) DC. [=RAB]

Hedysarum glabellum Michx.

Roadside and disturbed areas. Infrequent. Jun–Sep; Aug–Oct.

Callahan 407 (NCSC).

Desmodium lineatum DC. [=RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Roadside and disturbed areas. Occasional. Jun–Sep; Aug–Oct.

Callahan 385 (NCSC).

9. GALACTIA P. Browne

Galactia regularis (L.) Britton, Sterns & Poggenb. [>*G. volubilis* (L.) Britt.–RAB, misapplied; > *G. macreei*–RAB]

Dolichos regularis L.

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill. Infrequent. Jul–Sep; Aug–Oct.

Callahan 408 (NCSC).

Galactia volubilis (L.) Britton var. ***volubilis*** [<*G. regularis*–RAB, misapplied]

Hedysarum volubilis L.

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill. Occasional. Jun–Aug; Jul–Oct.

Callahan 383 (NCSC); *Callahan 384* (NCSC); *Callahan 386* (NCSC); *Callahan 387* (NCSC).

10. LESPEDEZA Michx.

Lespedeza bicolor Turcz. [=RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Roadside and disturbed areas. Occasional. Jun–Sep; Aug–Nov.

Callahan 169 (NCSC).

Lespedeza cuneata (Dum. Cours.) G. Don [=RAB]

Anthyllis cuneata Dum. Cours.

Black Water Bottomland Hardwoods (High Subtype). Occasional. Jul–Sep; Oct–Nov.

Callahan 48 (NCSC).

Lespedeza violacea (L.) Pers. [=*L. intermedia* (S. Watson) Britton–RAB]

Hedysarum violaceum L.

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Roadside and disturbed areas. Occasional. Jul–Sep; Aug–Nov.

Callahan 170 (NCSC).

11. MIMOSA L.

Mimosa microphylla Dryand. ex Sm. [=*Schrankia microphylla* (Dryand. ex Sm.) J.F. Macbr.–RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Roadside and disturbed areas. Occasional. Jun–Sep; Oct–Nov.

Callahan 95 (NCSC).

12. ORBEXILUM Raf.

Orbexilum psoralioides (Walter) Vincent [=*Psoralea psoralioides* (Walter) Cory var. *psoralioides*–RAB]

Trifolium psoralioides Walter

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Roadside and disturbed areas. Occasional. May–Jul; Jul–Sep.

Callahan 122 (NCSC).

13. ROBINIA L.

Robinia nana Elliott [>*R. nana*–RAB, >*R. elliottii*–RAB]

Scrub Oak Sandhill; Roadside and disturbed areas. Rare. Apr–Jun; Jul–Oct.

Callahan 164 (NCSC); *Callahan 168* (NCSC).

Robinia pseudoacacia L. [=*Robinia pseudo-acacia*–RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantation; Roadside and disturbed areas. Occasional. April–Jun; July–Nov.

Callahan 133 (NCSC).

14. STYLOSANTHES L.

Stylosanthes biflora (L.) Britton, Sterns & Poggenb. [=RAB]

Trifolium biflorum L.

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Roadside and disturbed areas. Occasional. Jun–Aug; Jul–Oct.

Callahan 290 (NCSC); *Callahan 378* (NCSC); *Callahan 379* (NCSC); *Callahan 380* (NCSC).

15. TEPHROSIA L.

Tephrosia florida (F. Dietr.) C.E. Wood [=RAB]

Galega florida F. Dietr.

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Roadside and disturbed areas. Frequent. May–Jul; Jun–Sep.

Callahan 138 (NCSC); *Callahan 139* (NCSC).

Tephrosia virginiana (L.) Pers. [=RAB]

Cracca virginiana L.

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Roadside and disturbed areas. Frequent. May–Jun; Jul–Oct.

Callahan 21 (NCSC); *Callahan 167* (NCSC).

FAGACEAE

1. QUERCUS L.

Quercus alba L. [=RAB]

Dry Oak Hickory Forest (Coastal Plain Subtype). Infrequent. Apr; Sep–Nov.

Callahan 720 (NCSC).

Quercus falcata Michx. [=*Q. falcata* var. *falcata*–RAB]

Dry Oak Hickory Forest (Coastal Plain Subtype); Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations. Abundant. Apr; Sep–Nov.

Callahan 119 (NCSC).

Quercus hemisphaerica W. Bartram ex Willd. [<*Q. laurifolia*–RAB]

Pine/Scrub Oak Sandhill. Frequent. Mar–Apr; Sep–Nov.

Callahan 684 (NCSC).

Quercus incana W. Bartram [=RAB]

Pine/Scrub Oak Sandhill. Abundant. Apr; Sep–Nov.

Callahan 113 (NCSC); *Callahan 199* (NCSC).

Quercus laevis Walter [=RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill. Abundant. Apr; Sep–Oct.

Callahan 112 (NCSC).

Quercus laurifolia (Ashe) Small [<*Q. laurifolia*–RAB]

Black Water Bottomland Hardwoods (High Subtype). Frequent. Mar–Apr; Sep–Nov.

Callahan 115 (NCSC); *Callahan 116* (NCSC); *Callahan 337* (NCSC); *Callahan 395* (NCSC).

Quercus margarettae (Ashe) Small [=RAB]

Quercus minor var. *laurfolia* Ashe

Pine/Scrub Oak Sandhill. Frequent. Apr; Sep–Nov.

Callahan 115 (NCSC); *Callahan 116* (NCSC); *Callahan 337* (NCSC); *Callahan 395* (NCSC).

Quercus marilandica Münchh. var. ***marilandica*** [<*Q. marilandica*–RAB]

Pine/Scrub Oak Sandhill. Abundant. Apr; Sep–Nov.

Callahan 114 (NCSC).

Quercus michauxii Nutt. [=RAB]

Black Water Bottomland Hardwoods (High Subtype); Pine Plantations. Occasional. Apr; Sep–Oct.

Callahan 117 (NCSC).

Quercus nigra L. [=RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill. Abundant. Apr; Sep–Nov.

Callahan 118 (NCSC); *Callahan 272* (NCSC); *Callahan 317* (NCSC).

GELSEMIACEAE

1. GELSEMIUM Juss.

Gelsemium sempervirens (L.) J. St.-Hill. [=RAB]

Bignonia sempervirens L.

Black Water Bottomland Hardwoods (High Subtype); Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations. Frequent. Feb–May; Sep–Nov.

Callahan 5 (NCSC); *Callahan 100* (NCSC).

GENTIANACEAE

1. SABATIA Adans.

Sabatia brachiata Elliott [=RAB]

Not seen on site by present author. Expected in pine savannas, pine/scrub oak sandhills, and mesic flatwoods (Weakley 2015). May–Aug; Aug–Sep.

Vicinity: *Godfrey 4532* (DUKE).

Sabatia difformis (L.) Druce [=RAB]

Swertia difformis L.

Not seen on site by present author. Reported in pine savannas (LeBlond 2007). May–Sep; Sep–Dec.

Vicinity: *Godfrey 4529* (DUKE).

Sabatia quadrangula Wilbur [=RAB]

W7; S2; G4G5. Cypress Savanna (Acid Subtype). Rare. Jun–Sep; Aug–Nov.

Callahan 203 (NCSC).

HYPERICACEAE

1. HYPERICUM L.

Hypericum crux-andreae (L.) Crantz [=*H. stans* W.P. Adams & N. Robson–RAB]

Ascyrum crux-andreae L.

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations; Roadside and disturbed areas. Frequent. Jun–Oct.

Callahan 101 (NCSC); *Callahan 103* (NCSC); *Callahan 104* (NCSC); *Callahan 217* (NCSC).

Hypericum denticulatum Walter [=*H. denticulatum* var. *denticulatum*–RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Drainage ditches. Occasional. Jul–Sep.

Callahan 218 (NCSC); *Callahan 219* (NCSC); *Callahan 220* (NCSC); *Callahan 221* (NCSC).

Hypericum galioides Lam. [=RAB]

Pine/Scrub Oak Sandhill; Drainage ditches. Occasional. Jun–Aug.

Callahan 227 (NCSC).

Hypericum gentianoides (L.) Britton, Sterns & Poggenb. [=RAB]

Sarothra gentianoides L.

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations; Roadside and disturbed areas. Frequent. Jul–Oct.

Callahan 120 (NCSC); *Callahan 228* (NCSC); *Callahan 229* (NCSC); *Callahan 230* (NCSC); *Callahan 231* (NCSC).

Vicinity: *Wilbur 56935* (DUKE).

Hypericum hypericoides (L.) Crantz [=RAB]

Ascyrum hypericoides L.

Pine/Scrub Oak Sandhill; Pine Plantations; Roadside and disturbed areas. Frequent. May–Aug.

Callahan 102 (NCSC); *Callahan 222* (NCSC); *Callahan 223* (NCSC); *Callahan 224* (NCSC); *Callahan 225* (NCSC); *Callahan 226* (NCSC).

Hypericum nudiflorum Michx. ex Willd. [=RAB]

Streamhead Pocosin (GNR). Occasional. Jun–Jul.

Callahan 232 (NCSC).

Hypericum setosum L. [=RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Drainage ditches. Occasional. May–Sep.

Callahan 233 (NCSC); *Callahan 234* (NCSC); *Callahan 302* (NCSC).

Hypericum tenuifolium A. St.-Hil. [=*H. reductum* (Svenson) W.P. Adams–RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill. Frequent. Jun–Sep.

Callahan 235 (NCSC); *Callahan 236* (NCSC); *Callahan 237* (NCSC); *Callahan 238* (NCSC); *Callahan 239* (NCSC); *Callahan 240* (NCSC).

Hypericum virginicum L. [=RAB]

Pine/Scrub Oak Sandhill. Infrequent. Jun–Sep.

Callahan 241 (NCSC).

JUGLANDACEAE

1. CARYA Nutt.

Carya pallida (Ashe) Engl. & Graebn. [=RAB]

Hicoria pallida Ashe

Not seen on site by present author. Reported to be present by AJ Bullard (pers. comm.). Expected in Pine/Scrub Oak Sandhill. Apr–May.

Carya tomentosa (Poir.) Nutt. [=RAB]

Juglans tomentosa Poir.

Dry Oak Hickory Forest (Coastal Plain Subtype); Pine/Scrub Oak Sandhill. Frequent. Apr–May; Oct

Callahan 215 (NCSC); *Callahan 311* (NCSC).

2. JUGLANS L.

Juglans nigra L. [=RAB]

Coastal Plain Small Stream Swamp; Black Water Bottomland Hardwoods (High Subtype). Infrequent. Apr; Oct.

Callahan 323 (NCSC).

LAMIACEAE

1. CALLICARPA L.

Callicarpa americana L. [=RAB]

Roadside and disturbed areas. Rare. Jun–Jul; Aug–Oct.

Callahan 173 (NCSC).

2. LAMIUM L.

****Lamium amplexicaule*** var. ***amplexicaule*** L. [<*L. amplexicaule*–RAB]

Not seen on site by present author. Expected along roadsides and in disturbed areas (Weakley 2015). Infrequent. Year round.

Vicinity: *Wilbur 5199* (DUKE).

3. MONARDA L.

Monarda punctata L. var. ***punctata*** [<*M. punctata*–RAB]

Not seen on site by present author. Expected along roadsides and in sandy woodlands (Weakley 2015) Jul–Sep; Sep–Oct.

Vicinity: *Wilbur 56946* (DUKE).

4. PRUNELLA L.

Prunella vulgaris L. var. ***lanceolata*** [<*P. vulgaris*–RAB]

Not seen on site by present author. Expected along roadsides and in disturbed areas (Weakley 2015). Apr–Dec.

Vicinity: *Godfrey 4551* (DUKE).

5. PYCNANTHEMUM Michx.

Pycnanthemum flexuosum (Walter) Britton, Sterns & Poggenb. [=RAB]

Origanum flexuosum Walter

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype). Occasional. Jun–Sep; Sep–Oct.

Callahan 146 (NCSC); *Callahan 147* (NCSC); *Callahan 148* (NCSC).

6. SCUTELLARIA L.

Scutellaria elliptica Muhl. var. ***elliptica*** [<*S. elliptica*–RAB]

Pine/Scrub Oak Sandhill; Pine Plantations; Roadside and disturbed areas. Infrequent. May–Jun; Jun–Jul.

Callahan 149 (NCSC); *Callahan 305* (NCSC).

Scutellaria integrifolia L. [>*S. integrifolia* var. *hispida* (Benth.) Epling–RAB]

Not seen on site by present author. Expected in Cypress Savanna (Weakley 2015). May–Jul; Jul–Aug.

Vicinity: *Godfrey 4539* (DUKE).

7. TRICHOSTEMA Gronov.

Trichostema dichotomum L. [=RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill. Occasional. Aug–Nov.

Callahan 336 (NCSC).

LENTIBULARIACEAE

1. UTRICULARIA L.

Utricularia juncea Vahl. [=RAB]

Drainage ditches. Infrequent. Jul–Sep.

Callahan 329 (NCSC).

LYTHRACEAE

1. DECODON J.F. Gmel.

Decodon verticillatus (L.) Elliott [=RAB]

Lythrum verticillatus Elliott

Mill Pond. Rare. Jul–Sep.

Callahan 332 (NCSC).

MELASTOMATACEAE

1. RHEXIA L.

Rhexia alifanus Walter [=RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Drainage Ditches. Frequent. May–Sep.

Callahan 157 (NCSC); *Callahan 297* (NCSC).

Rhexia aristosa Britton [=RAB]

State SC-V; S3, G3G4. Cypress Savanna (Typic Subtype). Rare. Jun–Sep.

Callahan 204 (NCSC).

Rhexia mariana L. var. ***exalbida*** Michx. [=RAB]

Pine/Scrub Oak Sandhill; Pine plantations; Drainage ditches. Frequent. Jun–Sep.

Callahan 36 (NCSC); *Callahan 45* (NCSC).

Rhexia mariana L. var. ***mariana*** [=RAB]

Pine/Scrub Oak Sandhill; Pine plantations; Drainage ditches. Frequent. May–Oct.

Callahan 46 (NCSC); *Callahan 155* (NCSC); *Callahan 324* (NCSC).

Rhexia nashii Small [=*R. mariana* var. *purpurea* Michx.–RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Drainage Ditches. Occasional. May–Oct.

Callahan 47 (NCSC); *Callahan 156* (NCSC); *Callahan 278* (NCSC); *Callahan 279* (NCSC).

Rhexia petiolata Walter [=RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Streamhead Pocosin. Occasional. Jun–Sep; May–Oct.

Callahan 316 (NCSC).

MYRICACEAE

1. MORELLA L.

Morella cerifera (L.) Small [=*Myrica cerifera* var. *cerifera*–RAB]

Myrica cerifera L.

Small depression Pocosin (Typic Subtype); Streamhead Pocosin. Occasional. Apr; Aug–Oct.

Callahan 158 (NCSC); *Callahan 330* (NCSC).

Vicinity: *Godfrey s.n*. (NCSC).

Morella pumila Small [=*Myrica cerifera* var. *pumila*–RAB]

Pine/Scrub Oak Sandhill; Pine Plantations; Roadside and disturbed areas; Streamhead Pocosin. Frequent. Apr; Aug–Oct.

Callahan 304 (NCSC).

NYSSACEAE

1. NYSSA L.

Nyssa biflora Walter [=*N. sylvatica* Marshall var. *biflora* (Walter) Sarg.–RAB]

Black Water Bottomland Hardwoods (High Subtype); Coastal Plain Small Stream Swamp; Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype); Streamhead Pocosin. Abundant. Apr–Jun; Aug–Oct.

Callahan 213 (NCSC).

Nyssa sylvatica Marshall [=*N. sylvatica* var. *sylvatica*–RAB]

Dry Oak Hickory Forest (Coastal Plain Subtype); Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine plantations. Frequent. Apr–Jun; Aug–Oct.

Callahan 73 (NCSC); *Callahan 212* (NCSC); *Callahan 388* (NCSC); *Callahan 389* (NCSC

OLEACEAE

1. CHIONANTHUS L.

Chionanthus virginicus L. [=RAB]

Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine plantations. Infrequent. Apr–May; Jun–Jul.

Callahan 160 (NCSC).

1. LIGUSTRUM L.

****Ligustrum sinense*** Lour. [=RAB]

Black Water Bottomland Hardwoods (High Subtype); Coastal Plain Small Stream Swamp; Pine Plantations. Infrequent. May–Jun.

Callahan 159 (NCSC); *Callahan 161* (NCSC).

ONAGRACEAE

1. LUDWIGIA L.

Ludwigia alternifolia L. [=RAB]

Drainage ditches. Infrequent. May–Oct.

Callahan 273 (NCSC).

Ludwigia linearis Walter var. ***linearis*** [<*L. linearis*–RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype). Infrequent. Jun–Sep.

Callahan 166 (NCSC).

Ludwigia ravenii C.-I. Peng [<*L. pilosa* Walter–RAB]

State T; S1, G1G2. Drainage ditches. Rare. Jun–Oct.

Callahan 267 (NCSC).

Ludwigia virgata Michx. [=RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype). Occasional. Jun–Sep.

Callahan 172 (NCSC); *Callahan 205* (NCSC); *Callahan 208* (NCSC); *Callahan 284* (NCSC).

OROBANCHACEAE

1. AGALINIS Raf.

Agalinis fasciculata (Elliott) Raf. [=RAB]

Gerardia fasciculata Elliott

Pine/Scrub Oak Sandhill; Pine plantations; Roadside and disturbed areas. Infrequent.

Callahan 310 (NCSC).

Agalinis linifolia (Nutt.) Britton [=RAB]

Gerardia linifolia Nutt.

W1; S3, G4?. Cypress Savanna (Acid Subtype). Rare. Aug–Sep; Sep–Oct.

Callahan 265 (NCSC).

Agalinis setacea (J.F. Gmel.) Raf. [=RAB]

Gerardia setacea J.F. Gmel.

Pine/Scrub Oak Sandhill; Pine plantations; Roadside and disturbed areas. Infrequent. Sep–Oct.; Oct–Nov.

Callahan 694 (NCSC).

1. AUREOLARIA Raf.

Aureolaria pedicularia (L.) Raf. ex Pennell [=RAB]

Gerardia pedicularia L.

Pine/Scrub Oak Sandhill. Infrequent. Sep–Oct.; Nov.

Callahan 163 (NCSC).

1. SEYMERIA Pursh

Seymeria cassioides (J.F. Gmel.) S.F. Blake [=RAB]

Afzelia cassioides J.F. Gmel.

Cypress Savanna (Acid Subtype). Rare. Aug–Oct.

Callahan 692 (NCSC); *Callahan 693* (NCSC).

OXALIDACEAE

1. OXALIS L.

Oxalis dillenii Jacq. [>*O. dillenii*–RAB]

Pine/Scrub Oak Sandhill; Pine plantations; Roadside and disturbed areas. Occasional. Feb–Nov.

Callahan 164 (NCSC); *Callahan 356* (NCSC); *Callahan 653* (NCSC).

Oxalis stricta L. [=RAB]

Pine/Scrub Oak Sandhill; Pine plantations; Roadside and disturbed areas. Occasional. May–Oct.

Callahan 165 (NCSC); *Callahan 340* (NCSC).

PASSIFLORACEAE

1. PASSIFLORA L.

Passiflora incarnata L. [=RAB]

Roadside and disturbed areas. May–Jul; Jul–Oct.

Vicinity*: Wilbur 5930* (DUKE).

PHYTOLACCACEAE

1. PHYTOLACCA L.

Phytolacca americana L. [<*P. americana*–RAB]

Roadside and disturbed areas. Rare. May–Nov.

Callahan 286 (NCSC).

PLANTAGINACEAE

1. NUTTALLANTHUS D.A. Sutton

Nuttallanthus canadensis (L.) D. A. Sutton [<*Linaria canadensis* (L.) Dum. Cours.–RAB]

Antirrhinum canadensis L.

Pine/Scrub Oak Sandhill; Pine plantations; Roadside and disturbed areas. Frequent. Mar–Aug; Apr–Nov.

Callahan 12 (NCSC).

1. PENSTEMON Schmidel

Penstemon pallidus Small [=RAB]

Pine/Scrub Oak Sandhill; Roadside and disturbed areas. Occasional. May–Jun.

Callahan 405 (NCSC); *Callahan 406* (NCSC).

1. PLANTAGO L.

****Plantago wrightiana*** Decne. [= *P. hookeriana* Fisch. & C.A. Mey. var. *nuda* (A. Gray) Poe–RAB]

Roadside and disturbed areas. Occasional. Apr–Jul.

POLYGALACEAE

1. POLYGALA L.

Polygala lutea L. [=RAB]

Cypress Savanna (Typic Subtype); Drainage ditches. Infrequent. Apr–Oct.

Callahan 30 (NCSC); *Callahan 216* (NCSC).

Polygala mariana Mill. [=RAB]

Not seen on site by present author. Expected in pine savannas and other wet habitats (Weakley 2015). Jun–Oct.

Vicinity: *Godfrey 4533* (DUKE).

POLYGONACEAE

1. PERSICARIA Mill.

Persicaria hydropiperoides (Michx.) Small [>*Polygonum hydropiperoides* var. *hydropiperoides*–RAB]

Polygonum hydropiperoides Michx.

Coastal Plain Semipermanent Impoundment (Typic Marsh Subtype); Coastal Plain Small Stream Swamp. Frequent. May–Nov.

Callahan 350 (NCSC).

Persicaria punctata (Elliott) Small [=*Polygonum punctata*–RAB]

Polygonum punctata Elliott

Coastal Plain Small Stream Swamp; Streamhead Pocosin. Frequent. Jul–Nov.

Callahan 313 (NCSC).

1. RUMEX L.

Rumex hastatulus Baldwin [=RAB]

Roadside and disturbed areas. Abundant. Mar–Jun; Apr–Jun.

Callahan 179 (NCSC); *Callahan 180* (NCSC); *Callahan 181* (NCSC); *Callahan 182* (NCSC); *Callahan 183* (NCSC).

Vicinity: *Wilbur 58469* (DUKE).

RHAMNACEAE

1. CEANOTHUS L.

Ceanothus americanus L. var. ***intermedius*** (Pursh) Torr. & A. Gray [<*C. americanus*–RAB, Weakley]

Ceanothus intermedius Pursh

Pine/Scrub Oak Sandhill. Occasional. May–Jun; Jun–Jul.

Callahan 125 (NCSC).

ROSACEAE

1. ARONIA Medik.

Aronia arbutifolia (L.) Pers. [=*Sorbus arbutifolia* var. *arbutifolia*–RAB]

Mespilus arbutifolia L.

Drainage ditches; Streamhead Pocosin. Occasional. Mar–May; Sep–Nov.

Callahan 176 (NCSC); *Callahan 177* (NCSC).

2. CRATAEGUS L.

Crataegus furtiva Beadle [=RAB]

Pine/Scrub Oak Sandhill; Pine Plantations; Roadside and disturbed areas. Occasional. Mar–Apr; Aug–Sep.

Callahan 360 (NCSC); *Callahan 721* (NCSC).

Crataegus lassa Beadle var. ***lassa*** [<*C.flava*–RAB]

Pine/Scrub Oak Sandhill; Pine Plantations. Infrequent. Mar–Apr; Aug–Sep.

Callahan 185 (NCSC).

Crataegus ravenelii Sarg. [<*C.flava*–RAB]

Pine/Scrub Oak Sandhill; Pine Plantations. Infrequent. Apr; Aug–Sep.

Callahan 187 (NCSC); *Callahan 359* (NCSC).

Crataegus uniflora Münchh. [=RAB]

Dry Oak Hickory Forest (Coastal Plain Subtype); Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations; Roadside and disturbed areas. Infrequent. Apr–May; Sep–Oct.

Callahan 184 (NCSC).

Crataegus visenda Beadle [<*C.flava*–RAB]

Pine/Scrub Oak Sandhill; Pine Plantations; Roadside and disturbed areas. Infrequent. Apr; Aug–Sep.

Callahan 359 (NCSC).

3. POTENTILLA L.

Potentilla canadensis L. [=RAB]

Pine/Scrub Oak Sandhill; Pine Plantations; Roadside and disturbed areas. Infrequent. Mar–May; Apr–Jun.

Callahan 22 (NCSC); *Callahan 193* (NCSC).

***Potentilla recta** L. [=RAB]

Not seen at PBP by present author. Expected along roadsides and in disturbed areas (Weakley 2015). Apr–Jul; May–Aug.

Vicinity: *Ahles 24662* (NCU).

4. PRUNUS L.

Prunus angustifolia Marshall [=RAB].

Not seen at PBP by present author. Expected along roadsides and in disturbed areas especially sandy ones. (Weakley 2015). Mar–Apr; May–Jul.

Vicinity: *Ahles 24618* (DUKE).

Prunus serotina Ehrh. var. ***serotina*** [<*P. serotina* var. *serotina*–RAB]

Pine/Scrub Oak Sandhill; Pine Plantations; Roadside and disturbed areas. Occasional. Apr–May; Jul–Aug.

Callahan 178 (NCSC).

5. PYRUS L.

***Pyrus calleryana** Decne. [=RAB]

Pine Plantations; Roadside and disturbed areas. Infrequent. Feb–Apr; Aug–Oct.

Callahan 4 (NCSC); *Callahan 314* (NCSC).

6. RUBUS L.

Rubus cuneifolius Pursh [=RAB]

Pine Plantations; Roadside and disturbed areas. Occasional. Apr–Jun; Jun–Jul.

Callahan 188 (NCSC).

Rubus flagellaris Willd. [=RAB]

Pine/Scrub Oak Sandhill; Pine Plantations; Roadside and disturbed areas. Occasional. Apr–May; May–Jul.

Callahan 189 (NCSC); *Callahan 361* (NCSC).

Rubus pensilvanicus Poir. [>*R. argutus* Link–RAB]
Roadside and disturbed areas. Occasional. Apr–May; May–Jul.

Callahan 190 (NCSC); *Callahan 191* (NCSC).

Rubus trivialis Michx. [=RAB]
Roadside and disturbed areas. Occasional. Mar–Apr; Apr–May.
Callahan 192 (NCSC).

7. SPIRAEA L.

Spiraea prunifolia Siebold & Zucc. [=RAB]
Black Water Bottomland Hardwoods (High Subtype); Roadside and disturbed areas. Rare. Apr–Aug; May–Nov.

Callahan 2 (NCSC).

RUBIACEAE

1. DIODIA Gronov.

Diodia virginiana L. [<*D. virginiana*–RAB]
Drainage ditches. Infrequent. Jun–Dec.

Callahan 128 (NCSC); *Callahan 6*91(NCSC).

2. DIODELLA Small.

Diodella teres (Walter) Small [=*Diodia teres*–RAB]

Diodia teres Walter

Roadside and disturbed areas. Occasional. Jun–Dec.

Callahan 128 (NCSC); *Callahan 283* (NCSC).

3. GALIUM L.

Galium aparine L. [=RAB]

Pine/Scrub Oak Sandhill; Pine Plantations; Roadside and disturbed areas. Occasional. May–Jul.

Callahan 127 (NCSC).

4. MITCHELLA L.

Mitchella repens L. [=RAB]

Pine Plantations. Infrequent. May–Jul; Jun–Jul.

Callahan 126 (NCSC).

5. RICHARDIA L.

****Richardia brasiliensis*** Gomes [=RAB]

Roadside and disturbed areas. Occasional. May–Nov.

Callahan 270 (NCSC); *Callahan 271* (NCSC); *Callahan 281* (NCSC).

****Richardia scabra*** L. [=RAB]

Not seen on site by present author. Expected in disturbed areas (Weakley 2015). Jun–Dec.

Vicinity: *Wilbur 59429* (DUKE).

SALICACEAE

1. SALIX L.

Salix nigra Marshall [=RAB]

Coastal Plain Small Stream Swamp. Frequent. Mar–May.

Callahan 264 (NCSC).

SAPINDACEAE

1. ACER L.

Acer rubrum L. var. ***rubrum*** [<*A. rubrum*–RAB]

Dry Oak Hickory Forest (Coastal Plain Subtype); Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations; Streamhead Pocosin. Frequent. Jan–Mar; Feb–Jul.

Callahan 352 (NCSC); *Callahan 353* (NCSC); *Callahan 354* (NCSC).

Acer rubrum L. var. ***trilobum*** Torr. & A. Gray ex K. Koch [<*A. rubrum*–RAB]

Cypress Savanna (Acid Subtype); Cypress Savanna (Typic Subtype). Occasional. Jan–Mar; Feb–Jul.

Callahan 194 (NCSC); *Callahan 195* (NCSC).

SOLANACEAE

1. SOLANUM L.

Solanum carolinense L. var. ***carolinense*** [<*S. carolinense*–RAB]

Pine/Scrub Oak Sandhill; Pine Plantations; Roadside and disturbed areas. Infrequent. May–Oct.

Callahan 196 (NCSC); *Callahan 197* (NCSC); *Callahan 683* (NCSC).

SYMPLOCACEAE

1. SYMPLOCOS Jacq.

Symplocos tinctoria (L.) L'Hér. [=RAB]

Hopea tinctoria L'Hér.

Black Water Bottomland Hardwoods (High Subtype); Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations; Streamhead Pocosin. Frequent. Mar–May; Aug–Sep.

Callahan 327 (NCSC).

TETRACHONDRACEAE

1. POLYPREMUM L.

Polypremum procumbens L. [=RAB]

Roadside and disturbed areas. Occasional. May–Oct; Aug–Oct.

Callahan 121 (NCSC); *Callahan 298* (NCSC); *Callahan 301* (NCSC); *Callahan 335*(NCSC).

THEACEAE

1. GORDONIA J. Ellis

Gordonia lasianthus (L.) J. Ellis [=RAB]

Hypericum lasianthus J. Ellis

Cypress Savanna (Acid Subtype); Streamhead Pocosin. Occasional. Jul–Sep; Sep–Oct.

Callahan 154 (NCSC).

URTICACEAE

1. BOEHMERIA Jacq.

Boehmeria cylindrica (L.) Sw. [=RAB]

Urtica cylindrica L.

Coastal Plain Small Stream Swamp. Frequent. Jul–Aug; Sep–Oct.

Callahan 154, 688 (NCSC).

VIOLACEAE

1. VIOLA L.

Viola bicolor Pursh. [=*V. rafinesquii* Greene–RAB]

Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Infrequent. Mar–May.

Callahan 390 (NCSC).

Viola lanceolata L. [=RAB]

Cypress Savanna (Typic Subtype); Drainage ditches. Infrequent. Feb–May.

Callahan 391 (NCSC); *Callahan 392* (NCSC).

Viola pedata L. var. ***pedata*** [<*V. pedata*–RAB]

Pine/Scrub Oak Sandhill; Roadsides and disturbed areas. Infrequent. Mar–May; May–Jun.

Callahan 28 (NCSC).

VITACEAE

1. MUSCADINIA (Planch.) Small

Muscadinia rotundifolia (Michx.) Small var. ***rotundifolia*** [=*Vitis rotundifolia* Michx.–RAB]

Vitis rotundifolia Michx.

Dry Oak Hickory Forest (Coastal Plain Subtype); Mesic Pine Savanna (Coastal Plain Subtype); Pine/Scrub Oak Sandhill; Pine Plantations. Frequent. May–Jun; Aug–Oct.

Callahan 277 (NCSC).

2. PARTHENOCISSUS Planch.

Parthenocissus quinquefolia (L.) Planch. [=RAB]

Hedera quinquefolia L.

Black Water Bottomland Hardwoods (High Subtype); Coastal Plain Small Stream Swamp; Streamhead Pocosin. Frequent. May–Jul; Jul–Aug.

Callahan 707 (NCSC).

3. VITIS L.

Vitis labrusca L. [=RAB]

Black Water Bottomland Hardwoods (High Subtype); Pine Plantation. Occasional. May–Jun; Sep–Oct.

Callahan 706 (NCSC).

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Table 1. Summary of taxa found at Pondberry Bay Preserve.

Group	Families	Genera	Taxa
Ferns and Allies	6	7	7
Gymnosperms	2	3	7
Basal Angiosperms	1	1	1
Magnoliids	2	6	7
Monocots	15	43	87
Eudicots	57	148	235
Total	**83**	**208**	**344**

Table 2. List of North Carolina significantly rare and watchlist taxa collected or reported from Pondberry Bay Preserve or vicinity (within 3.2 km [2 mi]). Status and rank designations follow Robinson (2018).

Taxon	Vouchered?	State Status	Federal Status	State Rank	Global Rank
Significantly Rare					
Astragalus michauxii	Yes	SC-V	-	S3	G3
Crocanthemum carolinianum	Yes	E	-	S1	G4
Eupatorium resinosum	No	SR-O	-	S3	G3
Lindera melissifolia	Yes	E	E	S1	G3
Litsea aestivalis	No	SC-V	-	S2S3	G3
Ludwigia ravenii	Yes	T	-	S1	G1G2
Rhexia aristosa	Yes	SC-V	-	S3	G3G4
Watch List					
Agalinis linifolia	Yes	W1	-	S3	G4?
Amphicarpum amphicarpon	Yes	W1	-	S3	G4
Andropogon perangustatus	Yes	W1	-	S2S3	G5T4
Dichanthelium erectifolium	No	W1	-	S2	G4
Lycopodiella prostrata	Yes	W7	-	S2	G5T4
Nuphar sagittifolia	No	W1	-	S2	G5T4
Sabatia quadrangula	Yes	W7	-	S2	G4G5
Scleria georgiana	Yes	W1	-	S3	G4
Solidago gracillima	Yes	W1	-	S3	G4

STATE STATUS: E = Endangered; T = Threatened; SC-V = Species Concern - Vulnerable; SR-O = Significantly Rare (Range sporadic or not fitting other significantly rare cateogoreis); W = Watch List: W1 = rare but relatively secure W7 = rare and poorly known. FEDERAL STATUS: E = Endangered STATE RANK: S1 = Critically imperiled, 1–5 populations in state; S2 = Imperiled, 6–20 populations in state; S3 = Vulnerable, 21–100 populations in state; S4 = Apparently secure, 101–1000 populations in state; S5 = Secure, 1001+ populations in state. GLOBAL RANK: G1 = Critically imperiled, 1–5 populations in world; G2 = Imperiled, 6–20 populations in world; G3 = Vulnerable, 21–100 populations in world; G4 = Apparently secure, 101–1000 populations in world; G5 = Secure, 1001+ populations in world; T# = Global rank of a subspecies or variety; NR = Not Ranked; Q = Questionable taxonomy; ? = Uncertain.

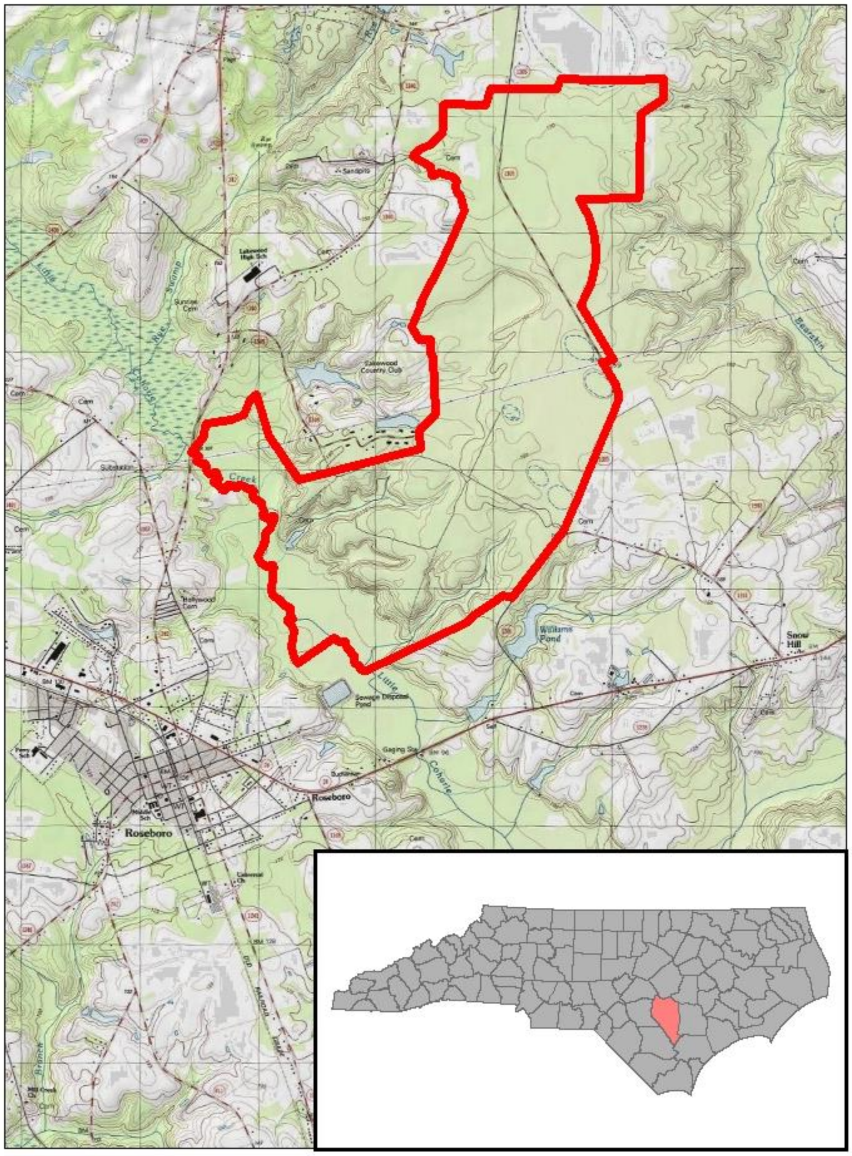

Figure 1. Location of Pondberry Bay Preserve with reference to North Carolina and Sampson County. Map produced by K. Callahan using ArcGIS.

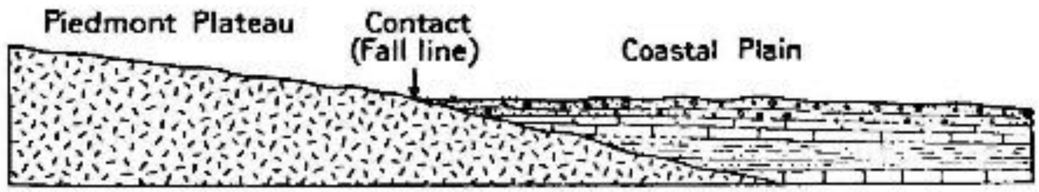

Figure 2. The boundary between the Piedmont and Coastal Plain physiographic regions occurs at the fall line where crystalline basement rocks meet the boundary of the sedimentary rocks deposited on top of them (from Watson 1910).

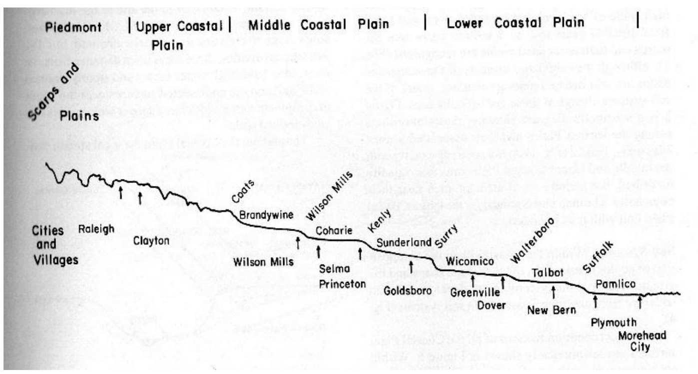

Figure 3. North Carolina Coastal Plain scarps and plains (Daniels et al. 1999).

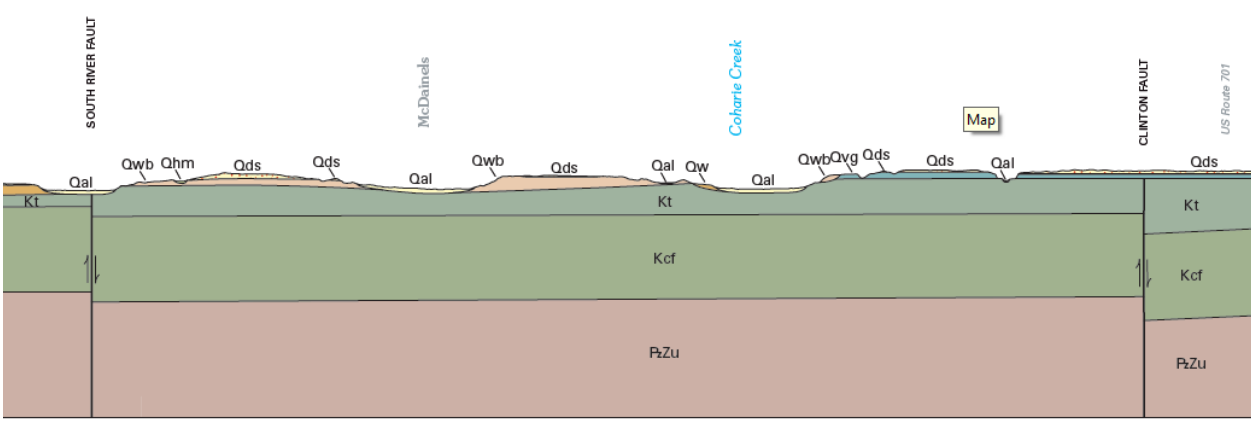

Figure 4. Cross section showing underlying geology in area near Pondberry Bay Preserve (Weems et al. 2011). See text for abbreviations.

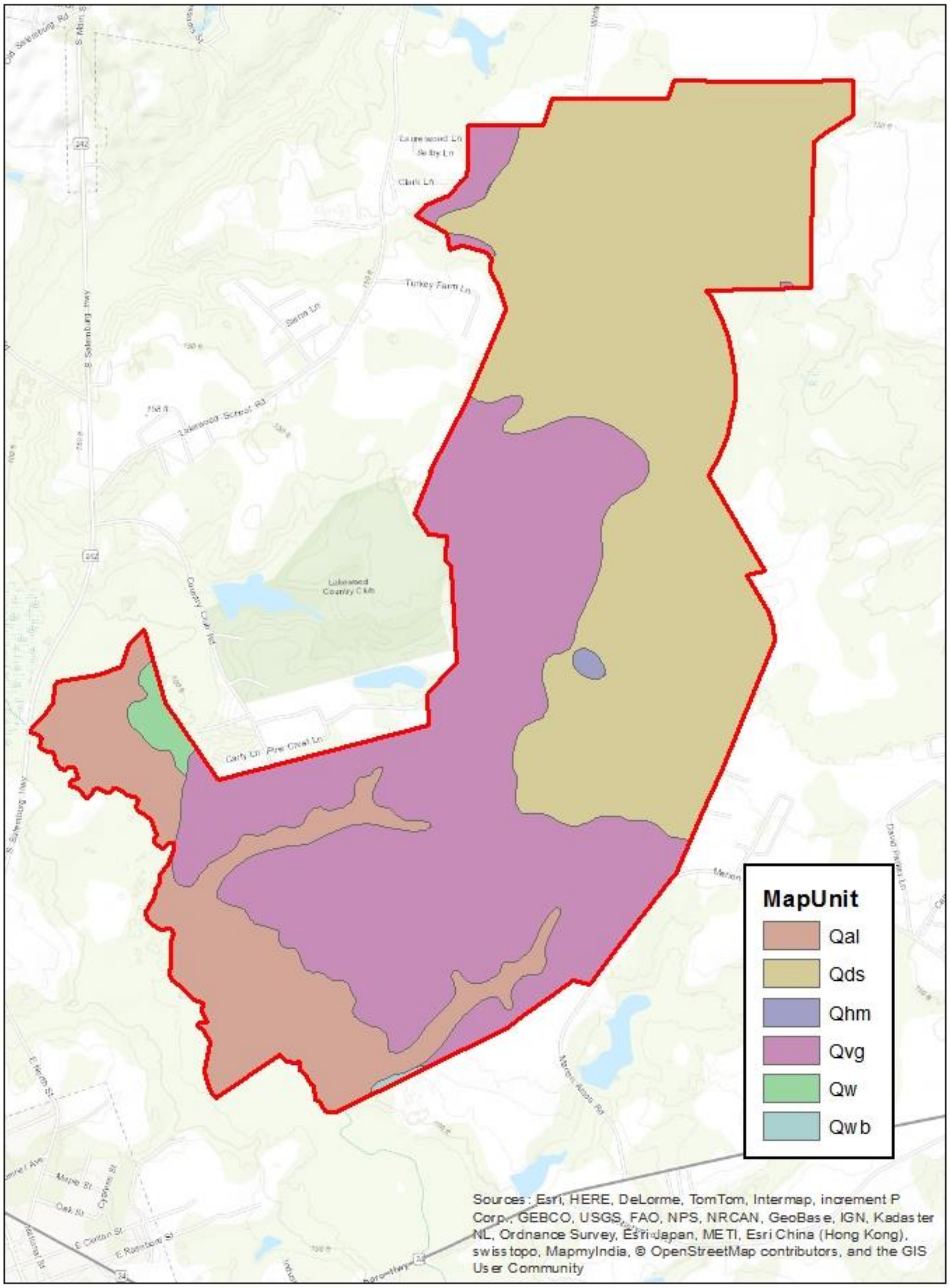

Figure 5. Surficial geology of Pondberry Bay Preserve according to map produced by Weems et al. (2011). See text for abbreviations. Map produced by K. Callahan using ArcGIS.

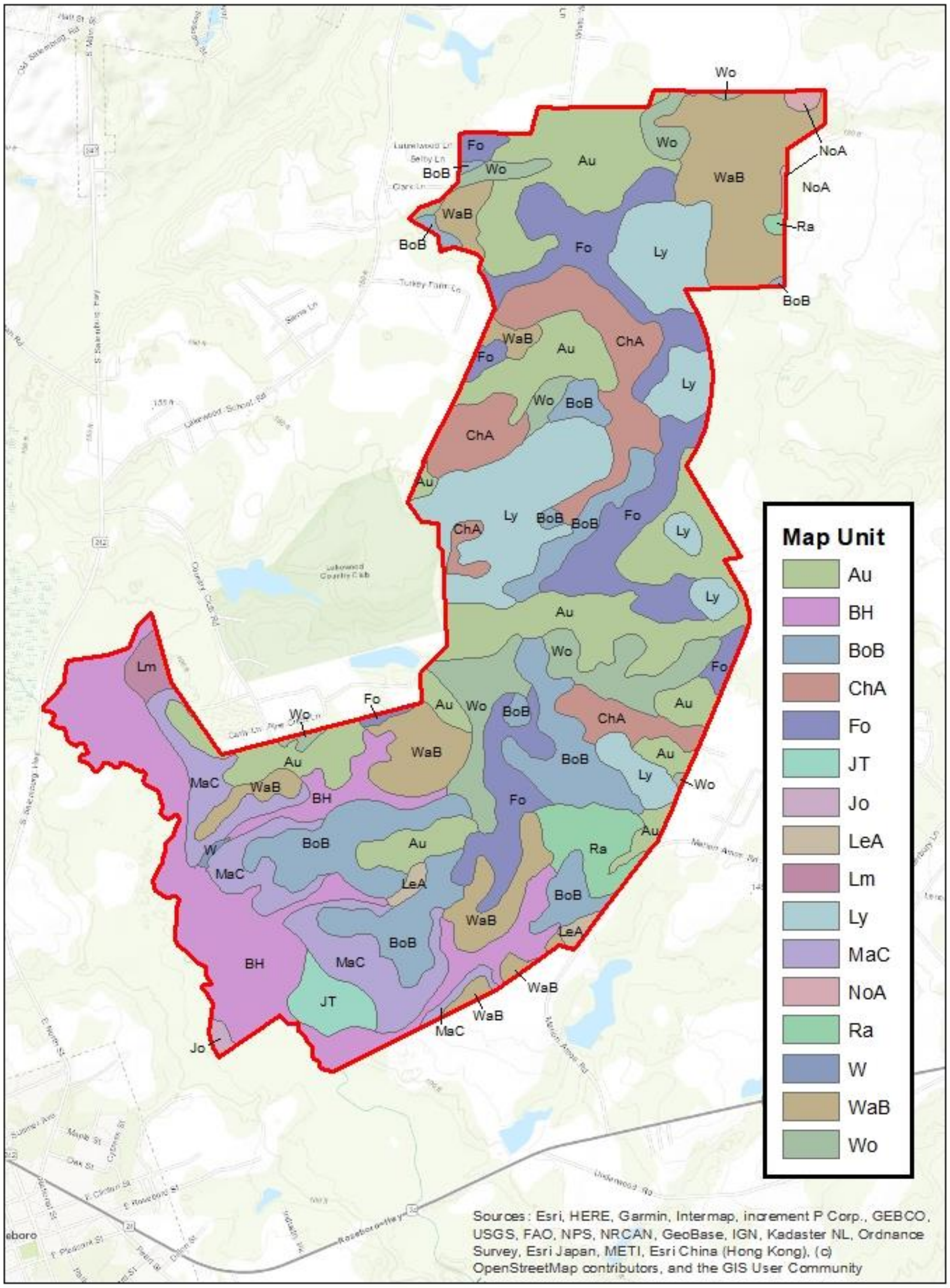

Figure 6. Soil map units for Pondberry Bay Preserve created from data from the Web Soil Survey (2019). See text for abbreviations. Maps produced by K. Callahan using ArcGIS.

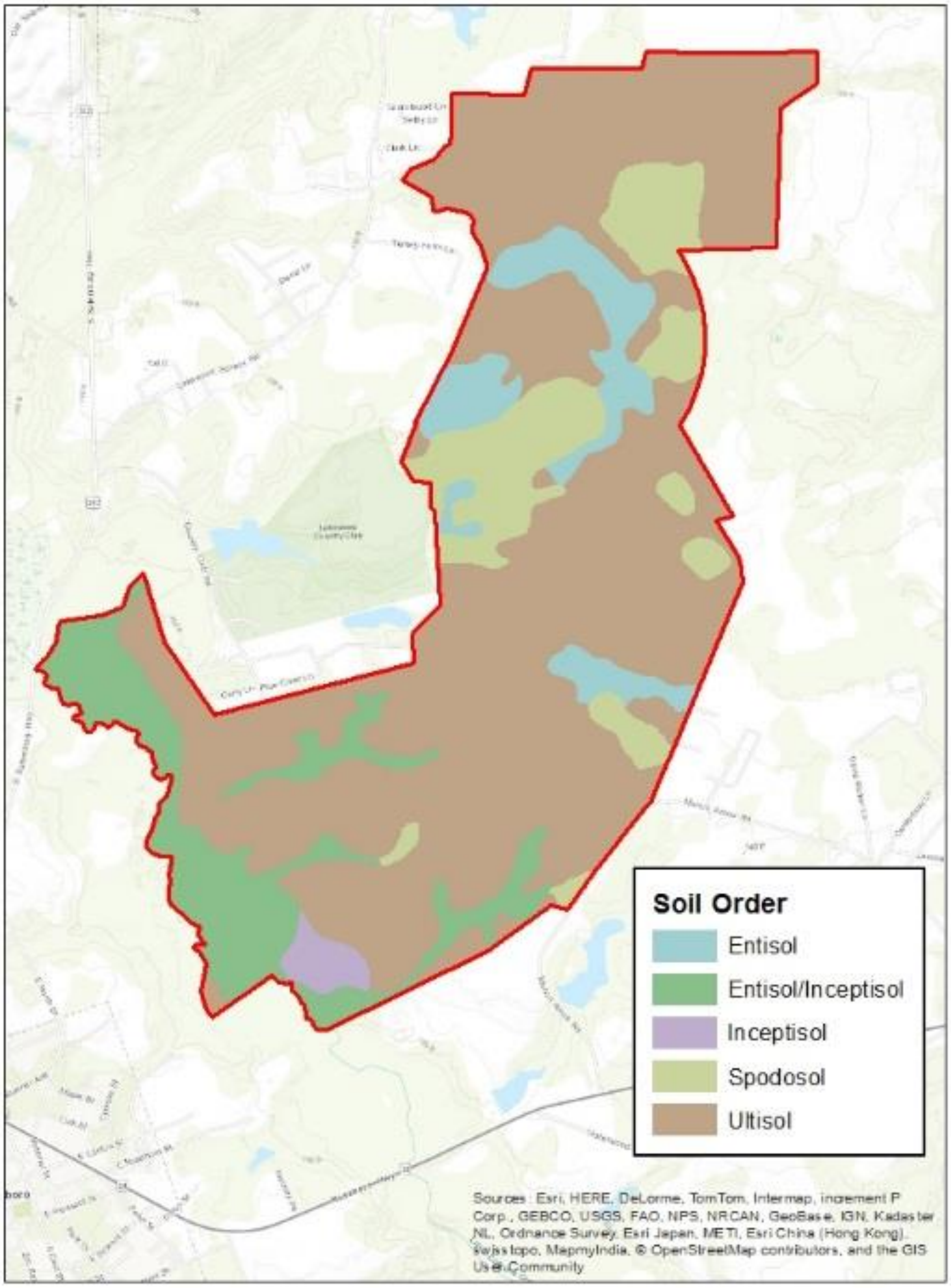

Figure 7. Soil orders for Pondberry Bay Preserve created from data from the Web Soil Survey (2019). See text for abbreviations. Maps produced by K. Callahan using ArcGIS.

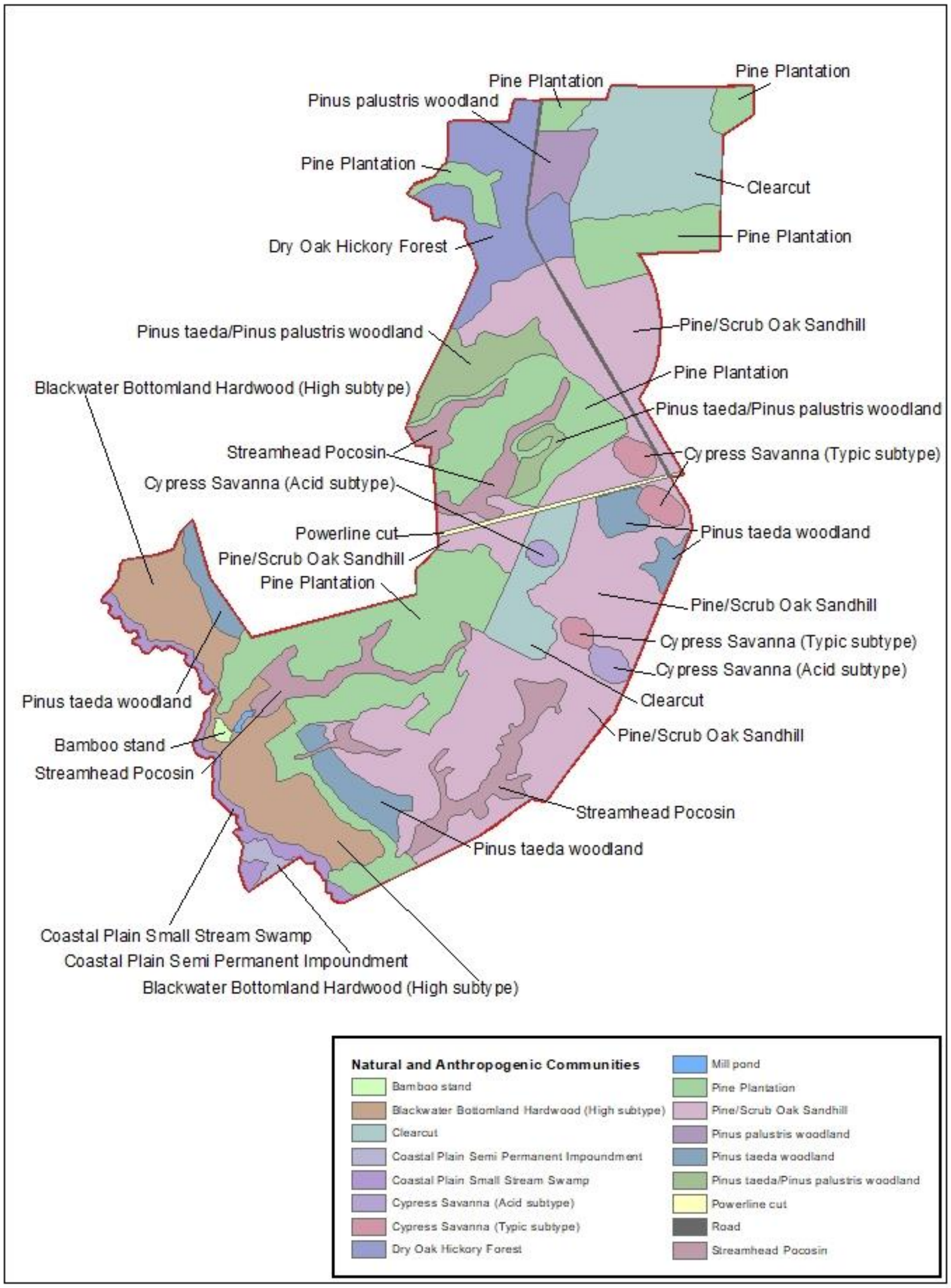

Figure 8. Vegetation communities of Pondberry Bay Preserve. Map produced by K. Callahan using ArcGIS.