National Park Service
US Department of the Interior

Chattahoochee River National Recreation Area
Georgia

Floodplain Statement of Findings

Paces Mill Unit Rehabilitation

May 2022

_____ Date: _____

Superintendent, Chattahoochee River
National Recreation Area
Recommended

_____ Date: _____

Chief
Water Resources Division
Certification of Technical Accuracy and
Service-wide Consistency

_____ Date: _____

Regional Director
Southeast Region
Approved

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INTRODUCTION

The National Park Service (NPS), Chattahoochee River National Recreation Area (National Recreation Area), has prepared a draft environmental assessment for proposed rehabilitation of the Paces Mill facility in the Palisades unit in Cobb County in the northern Atlanta metropolitan area, Georgia (figure 1).

Executive Order 11988, "Floodplain Management" and Executive Order 11990, "Protection of Wetlands" require the National Park Service and other federal agencies to evaluate the likely impacts of actions in floodplains and wetlands. NPS Director's Order 77-1: *Wetland Protection* and *NPS Procedural Manual #77-1: Wetland Protection* provide NPS policies and procedures for complying with Executive Order 11990, and NPS Special Directive 93-4: *Floodplain Management Guideline* provides NPS procedures for complying with Executive Order 11988. This statement of findings (SOF) documents compliance with these NPS wetland protection and floodplain management procedures. Paces Mill is nearly entirely within the 100-year floodplain of the Chattahoochee River.

PROPOSED ACTION

The National Recreation Area is proposing to rehabilitate and reconfigure Paces Mill (table 1, figures 1–4). This includes upgrading the physical design, appearance, and infrastructure to address current deficiencies; to create a sustainable unit with a strong NPS identity; and one that is safe, easy to access, and enjoyable to visit. Additional detail can be found in the environmental assessment (NPS 2022) for this project, including design documents in the appendixes. During construction, staging and work would be phased to keep river access open. The unit would be impacted by construction activity and not have available parking, but a boat ramp would remain open for emergency response. Construction is expected to last 8 to 11 months. Standard and customized best management practices would be implemented as described in the environmental assessment (NPS 2022).

Table 1. Proposed Action Elements

Elements	Proposed Action
Parking and Roads	To create a more desirable NPS experience, the current primary parking area would be removed and restored to a meadow consisting of native endemic prairie plant species as described below. A new parking area would be constructed farther north that would replace much of the area where the mowed grass field is currently located. The parking area would be sited to minimize the potential for vehicles to block traffic near the boat launch and would include a designated dropoff and pickup area, and trailer parking. Parking would consist of a two-way elongated "U" with approximately 176 perpendicular parking spaces. The total area encompassed by the parking lot would be similar to the current parking lot, but the paved area would be less than half due to the configuration and the impervious surfaces within the oval. Thirty parking spaces would be added to the site west of the entry road accessed from US 41 southbound. Twenty-four spaces would be added adjacent to the southern boat ramp. Fifteen parallel parking spaces would be added along the road connecting the west and east sides of the unit. The estimated total number of parking spaces at Paces Mill would remain the same at approximately 243. Speed tables (long, flat-topped speed bumps), crosswalks, and shade trees (only where outside of the 150-feet-wide Georgia Power easements) would be added to the road. All roads in Paces Mill would accommodate two-way traffic with the exception of the parking loop, which would be one-way. Road and parking lot surfaces would be asphalt with concrete curbs. Wood guardrails would be installed adjacent to roads to prevent parking outside designated parking spaces.

Elements	Proposed Action
Vendor Pickup Area / South Boat Ramp	The layout of this area would be changed to add an oval turnaround loop for boat trailers and 24 parking spaces. This existing ramp is steep, the water is deeper and swifter, which allows motorized access, although the steepness of the ramp is not ideal for trailers. The area would have pull-through trailer parking for loading/offloading. Note: the northern boat ramp does not currently provide motorized access because the water is too shallow and would remain so. Access to boat ramps would be demarcated during construction.
Visitor Contact Station	The current restroom would be removed and a new visitor contact station constructed in the middle of the open end of the parking lot, near the current location, at a raised elevation to reduce the potential for flooding. Materials and drainage systems that minimize damage if flooded would be included. The new contact station would consist of three structures and would be connected to the same water, sewer, and electric utilities currently on-site. The front (southwest) building would be a pavilion/shade structure. A fee station would be moved from its current location to the hard-surface trail connecting the parking lot with the visitor contact station and interpretive and regulation signage. The northern two structures would consist of single-user restrooms/changing rooms. The buildings would include wood and stone construction and be more typical of NPS visitor use buildings. Locally sourced wood and stone would be used for the buildings and walkways to the extent possible. The buildings would optimize energy performance by including a glass pane above the door to minimize the need for lighting. A single LED light fixture would be in each restroom. Except for the restrooms/changing rooms, the visitor contact station would be open and not include heating or air-conditioning. The facility would be Architectural Barriers Act (ABA) compliant and accessible to people with disabilities. Existing trees would be retained to the extent practicable.
Meadow with Native Endemic Prairie Plant Species	The current parking area would be demolished and restored to an approximately 1.5-acre piedmont meadow, planted with native, endemic, non-woody, prairie wildflowers, forbs, and grasses. The plantings would include species found in a prairie remnant along adjacent US 41, including Georgia aster (*Symphyotrichum georgianum*), a state threatened species. Plantings would include seeds, plugs, and plants. The minimum number of plantings, including Georgia aster, would exceed the number of existing native wildflowers in the parking lot islands. Vegetation would average approximately 3 feet high in late summer. A multiuse trail would flank three of its four sides. Existing trees would be retained to the extent practicable. The area would be fenced with wooden split rail fence to establish the meadow and create a designated and interpreted space at Paces Mill. The site would be maintained as an early successional piedmont prairie with scheduled mowing. Moveable trails would be mowed through the meadow. The prairie vegetation would take 1 to 3 years to become established, and it would be watered for 2 to 3 years. Details of the restoration process, including a plant species list, can be found in appendix H of the environmental assessment (NPS 2022).
New Natural Surface Trail	A new natural-surface, single-track pedestrian-only trail (type 1 in the Trails Management Plan [NPS 2022]) would be created in the wooded section, between the picnic area and the river amphitheater. It would be approximately 2 to 4 feet wide and 800 feet long. The trail would be set back from the river at least 50 feet, in compliance with the Metropolitan River Protection Act. Trail construction would limit vegetation clearing (maximum of approximately 0.3 acre). The trail would be aligned to avoid the need to remove larger trees to the extent practicable. This would likely include using existing social trails along the river as part of the alignment. Remaining social trails would be closed to the extent possible via signage and barriers. The trail would also include access to an elevated river overlook described below. The trail would be maintained minimally including clearing fallen trees, trimming branches and brush, and repairing soil erosion as needed.
Southern Elevated River Overlook	An elevated river overlook would be constructed and consist of a wood platform on the top of the bank, which would not overhang the river. The overlook would be located where people have already created social trails. The site would offer good views of the river while tree/vegetation clearing would be kept to a minimum. This area is densely populated with nonnative species so most vegetation removed would be exotics. The overlook would be accessed via the new natural surface trail described above.
Hard-Surface, Multiuse Trails	A 10-foot-wide, multiuse, universally accessible, hard-surface sidewalk would encircle the interior of the site, providing visitors an easy way to navigate the site and to recreate at Paces Mill (walk, jog, bike, etc.). Interior multiuse sidewalks would connect visitors to the Bob Callan Trail on the north, and US 41 sidewalks.

Elements	Proposed Action
River Amphitheater Seating Area and River Access	The existing riprap on the riverbank, underneath the bridge, would be converted to a river amphitheater seating area and river access point. This area would be reconfigured using large, wide concrete steps that descend into the river. The area would be accessed using the hard-surfaced sidewalk on the southeast side of the southbound US 41 access road. The park will coordinate this project component with the Georgia Department of Transportation (GDOT), which owns the land under the bridge.
Northern Elevated River Overlook	A wood platform river overlook would be developed near the large river take-out sign's current location (this sign would remain for safety reasons). The platform would be sited on top of the riverbank and would not overhang the river. The proposed site is in an open area and very little, if any, vegetation removal would be necessary to construct it. A hard-surface sidewalk would connect it to the sidewalk encircling the parking area.
Picnic Area	The picnic area would remain in its current location. Several picnic tables would be replaced. One additional table would be added for a total of nine.
Shade Structure / Gathering Area	The existing deck, between the picnic area and the limited river access area, would be demolished, rebuilt in its current location on the exiting piers, and expanded. A shade structure would be added.
North Boat Ramp	Existing boulders, blocking vehicle access to the river, would be removed and replaced with a combination of fixed and removable bollards (short posts used to block vehicle access).
Bike Share	The existing bike share would be retained, but moved a short distance to the southwest corner of the new parking lot.
Dumpster Pad	A dumpster pad and dumpster would be located at the intersection of the boat ramp and east parking lot entrance. The dumpster would be shielded from view with a low granite wall and landscaping.
Signage	Most existing signage would be removed and replaced with as few signs as possible while still meeting site needs. New signage would address vehicular flow, parking requirements, allowed uses, interpretation, etc. Most of the signage would be in the pavilion at the visitor contact station, and would include allowed uses and rules, including but not limited to those associated with vehicle parking, boating, dogs, hours, fees, and fires. Waysides (interpretive signs) interpreting the meadow would be added.
Utilities	Power, water, sanitary sewer, and telecommunication utilities are all currently within 75 to 100 feet of the proposed visitor contact station and would be connected to the new facilities.
Site Grading and Storm Drainage	Most site grading would be for the new parking lot and around the visitor contact station. The finished grade would be similar or slightly below the current grade. Five bioswales would be constructed, two along the entrance roads, two in the northern parking lot, and one in the southern parking lot. They would contain moderate slopes on both sides with a gently sloped bottom. The bioswales would be planted in three zones: dry, mesic (moderate moisture), and wet/moist from top to bottom. Several species with the corresponding moisture tolerances would be planted in each zone. A rocky bottom stream channel would be located at the lowest elevation. The parking lots would be pitched to drain into the bioswales. An outlet structure would be constructed in the bioswale areas and approximately 400 feet of 18-inch, reinforced concrete pipe would be installed between the bioswales and the river where water would enter the river through river rock riprap. Additionally, the existing storm drains in the bioswale area, adjacent and south of the northbound US 41 entrance, would be reworked to accommodate the new bioswale design. Another outlet and approximately 100 feet of 18-inch, reinforced concrete pipe would be installed here to drain into the river, also through river rock riprap at the river. See appendix H in the environmental assessment (NPS 2022) for details.

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SITE DESCRIPTION

Paces Mill (approximately 14 acres) is the last "take-out" point in the park for casual rafters and kayakers. The unit is at the southern boundary of Cobb County; it was developed in the 1970s (figures 1 and 2). The river flows along the eastern and southern border of the site. Paces Mill is bordered by residential development to the west and northwest. Land use to the east of the river's floodplain is zoned commercial. Cobb Parkway (US 41) crosses the site in the southwestern portion of the property, including a bridge over the river. Additional NPS lands in the Palisades unit border Paces Mill to the northeast along the river. Stillhouse Creek flows into the river at the downstream boundary of Paces Mill.

Paces Mill includes mixed hardwood/pine woodlands to the west of Cobb Parkway and approximately the southeastern half of the property east of the parkway along the river. The remainder of Paces Mill includes a paved parking lot, entry roads, hard-surfaced walkways, a restroom, two boat ramps, a wood deck, dumpsters, a bike share rack, signs, and utilities connected to the restroom. High tension powerlines run through Paces Mill. A mowed grassy area is located in the northeastern corner of the facility. Native prairie vegetation is planted in the parking islands and in a pollinator garden near the restrooms; erosion control grasses are planted alongside the parkway and entrance roads.

FLOODPLAINS

The surface water hydrology of the Chattahoochee River is largely determined by the geological setting and processes that have formed the watershed, as well as hydrologic flow regulation by Buford Dam and its reservoir, which has altered the Chattahoochee River both physically and chemically. The river within the park is located within the Piedmont Province, Southern Piedmont section, Upland Georgia subsection, flowing along the Brevard Fault in a northeast to southwest direction.

This geological setting produces a relatively long and narrow watershed, surrounded in the vicinity of the park by rapidly developing urban and suburban areas. These features channel a large amount of nonpoint runoff into the river in this narrow watershed during storm events, which affect park characteristics, especially water. The portion of the Chattahoochee River watershed encompassed by the park extends from river mile 348.3 at Buford Dam to river mile 300.5 at Peachtree Creek and drains 416 square miles below Buford Dam.

Water releases from Buford Dam provide electrical power during peak demand periods. These surges create rapid and large changes in water levels and velocities downstream of Buford Dam. The surges have resulted in significant erosion of the riverbanks for as far as 20 miles downstream, significant widening of the river, and increased numbers of trees falling into the river (NPS 2000).

Elevations at Paces Mill range from 750 feet at the river to approximately 775 feet across most of the site, which is generally level above the banks of the river. The site is bordered to the west by a palisade (steep uphill slope). Nearly the entire project site is in the 100-year floodplain and Federal Emergency Management Agency (FEMA) Zones AE and A (figure 5). A 100-year floodplain or 100-year flood describes an area or event subject to a 1% probability of a certain size flood occurring in any given year. Zones A and AE are defined by FEMA as the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood height. Detailed hydraulic analyses are not conducted for Zone A, but are for Zone AE where base flood elevations are determined and mapped. The base flood elevation (100-year flood) for this site is 778 feet. Impervious surfaces at Paces Mill total approximately 5 acres.

Peak annual streamflow is depicted below for three US Geological Survey (USGS) stream gauges: one upstream, one at Paces Mill, and one downstream (tables 2-4) (USGS 2022). Years of data availability vary by gauge.

Table 2. Peak Annual Streamflow, USGS 02335880, Chattahoochee River at Powers & I-285 near Atlanta, Georgia (upstream of Paces Mill).

Year	Peak Streamflow (cfs)
1920	63,000
1946	59,000
1972	16,400
1973	17,700
1974	13,500
1975	17,400
1976	15,500
1977	26,000
1979	23,000
1982	22,000
2019	19,700
2020	16,900

Table 3. Peak Annual Streamflow, USGS 02335990, Chattahoochee River, US 41, near Atlanta, Georgia (at Paces Mill).

Year	Peak Streamflow (cfs)
1972	17,500
1973	16,800
1974	14,100
1975	18,000
1976	19,200
1977	28,900
1978	15,200
1979	26,700
1980	15,000
1981	8,460
1982	24,100
1983	15,400
1984	18,100
1985	9,910
1986	6,870
1987	17,300
1988	9,920
1989	12,500
1990	25,100
1991	15,000

Table 4. Peak Annual Streamflow, USGS 02336490 Chattahoochee River, GA-280, near Atlanta, Georgia (downstream of Paces Mill).

Year	Peak Streamflow (cfs)
1990	33,000
1991	16,000
1992	15,900
1993	23,400
1994	17,200
1995	20,500
1996	28,500
1997	22,300
1998	27,700
1999	8,590
2000	19,800
2001	14,300
2002	19,100
2003	23,300
2004	31,000
2005	27,300
2006	14,200
2007	14,900
2008	9,810
2009	**42,300**
2010	27,200
2011	12,700
2012	12,900
2013	20,100
2014	21,100
2015	15,500
2016	19,700
2017	17,500
2018	13,300
2019	28,200
2020	24,900
2021	28,200

The National Park Service has determined that the applicable regulatory floodplain for the proposed project is Class I (DO 77-2, PM 77-2).

WETLANDS

A qualified wetland scientist conducted a wetlands delineation of Paces Mill on December 5, 2018, which confirmed that no wetlands are present other than the river channel itself (see below) (Aarcher 2019) (appendix A). The wetland delineation was conducted in accordance with the US Army Corps of Engineers (USACE) Wetland Delineation Manual (USACE 1987), Region Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont (USACE 2012), and the Cowardin et al. (1979) wetlands and deepwater habitats classification system. The scope of the project is not large enough to affect wetlands downstream.

The Chattahoochee River at Paces Mill is classified as a riverine wetland, lower perennial, unconsolidated bottom, and permanently flooded (R2UBH) (Cowardin et al. 1979). A portion of the riprap along the river shore, under the bridge, would be replaced with stone steps that would descend into the river. The steps would replace existing riprap. This action would have no impact on existing riverine wetland function, the total new wetland impacts (permanent and temporary) from construction would be less than 0.1 acre. The action is listed in section 4.2.1 of Procedural Manual #77-1 (NPS 2016) as an exempt action under, "**Maintenance, repair, or renovation** (but not full reconstruction[1] or expansion) of currently serviceable[2] facilities or structures:

- …This exception allows for **minor** (0.1 acre or less) deviations in the structure's configuration or fill footprint in wetlands due to changes in construction codes, methods, or safety standards (e.g., handicap accessibility), but does not apply to other types of reconstruction/expansion (e.g., road widening to increase capacity, road re-routing) or conversion to other uses that cause new adverse impacts on wetlands."

Therefore, this project is exempt from the NPS Wetland Statement of Finding and compensation requirements.

The National Park Service will coordinate with the US Army Corps of Engineers to ensure that the work is authorized under section 404 of the Clean Water Act.

[1] Full reconstruction of instream diversions, water intake or outfall structures, or similar, legal and permitted instream structures that are damaged or destroyed by storms, floods, or similar events may be allowed under this exception.

[2] "Currently serviceable" means usable as is or with maintenance or renovation, but not so degraded as to require full reconstruction.

JUSTIFICATION FOR USE OF THE FLOODPLAIN

The justification for relocating, upgrading, and augmenting existing structures in the 100- year floodplain is as follows:

- The purpose of the unit and its existing functions are river access. Therefore, functions of the unit cannot be moved to another location.
- As noted above, nearly the entire unit is within the 100-year floodplain.
- As noted above, the steep adjacent topography prevents moving the facilities farther upslope.
- The site is needed to provide park visitors with opportunities for land- and water-based recreation in the southern part of the park. Demand for recreational (land and water based) opportunities has been growing.
- This site is the last stop of the National Water Trail.
- This unit provides a gateway to the National Recreation Area as it is within the Atlanta metropolitan area and includes a trailhead for the popular Bob Callahan trail and is adjacent to a multiuse trail that will connect the National Recreation Area with the city of Atlanta and another popular trail.

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SITE-SPECIFIC FLOOD RISK

Flood risks associated with the proposed action include risk to capital investment resulting from damage to infrastructure and a slight risk to human health and life due to floodplain occupancy.

Paces Mill occupies approximately 14 acres, almost all of which is in the 100-year floodplain. The proposed project, which includes new infrastructure, would result in new impacts to property and to floodplain functions and values. New pavement and impervious surface would be installed in the form of new parking areas, multiuse trail, visitor contact station, and restrooms. However, the total area of impervious surface increase after project implementation would be small because the current primary parking lot would be removed and converted to permeable surface, much of the multiuse hard-surface trail would be sited where pavement already exists, and the existing restroom facility would be removed. The reconfigured pavement and structures are unlikely to negatively affect flood storage or groundwater recharge to a measurable degree, or degrade overall riparian services because the impervious surface footprint would remain approximately the same after construction (5 acres). The flood hazard to capital investment is moderated by the fact that the river system is regulated by Buford Dam. Local rainfall events typically do not produce flood conditions at the site. More regional rainfall is typically needed to produce flooding conditions at the site.

The 2009 flood left no evidence of scour on the terrace level, where the proposed infrastructure would be located. NPS staff witnessed low flow velocities during this flood. The primary risk on the terrace is sedimentation (being covered by mud) rather than removal by scouring.

Ample notice of severe weather is provided by the National Weather Service and other agencies, which makes warning and evacuating the site a practical option for protecting human life, minimizing the risk to human health and safety.

FLOOD MITIGATION PLAN

The proposed rehabilitation project does not include any changes that would reduce flood storage capacity. The risk of flooding would remain, similar to current conditions. Because proposed and existing structures are located within the floodplain, damage from flooding may occur. The park is willing to accept potential flood damage to structures as the price of providing recreational facilities at this unit.

The following measures are included in the proposed project as design features and would reduce hazards to human life and property in the regulatory floodplain while minimizing the impact on the natural resources of the floodplain:

- The parking lot and drainage system, including bioswales, would include design features to improve drainage patterns to facilitate water return to the river and temporary water pooling on permeable rather than impervious surfaces.
- The visitor contact station, including restrooms, would be consistent with the intent of the standards and criteria of the National Flood Insurance Program (44 CFR Part 60).
- The contact station would be open, which would allow water flow through during flooding.
- The proposed design would include an increased proportion of the total area of native vegetation versus nonnative, largely due to removal of the mowed field and creation of the native prairie meadow.
- All rehabilitated areas would use appropriate native plant materials approved by the National Park Service.
- All disturbed areas would be stabilized as soon as practical to limit erosion and the spread of noxious and nonnative plants.
- The most natural areas of the floodplain, including the wooded areas along the river and tributary, would remain with only minimal disturbance for natural soft surface trail construction.
- All native trees and vegetation would be left in place to the maximum extent possible.
- No overnight use of the unit would be allowed.
- The unit would be closed when flooded.

SUMMARY

The National Park Service has determined that there are no practicable, non-floodplain locations for the proposed action. Potential impacts to human life and health would be mitigated through use pattern (no overnight use) and flood closures. The potential impacts to the proposed capital investment would be mitigated through a combination of implementing design standards consistent with the National Flood Insurance Program's Floodplain Management Criteria for Flood-Prone Areas (44 CFR section 60.3) and selecting movable or sacrificial infrastructure such as picnic tables.

Despite the new parking spaces, trailer spaces, multiuse path, restrooms, visitor contact area, and other paved areas, the natural and beneficial floodplain values are not expected to be negatively impacted to any measurable extent because the cumulative amount of impervious surface at the site would remain approximately the same (5 acres). Aboveground structures would be designed to minimally impede floodwater flows. Therefore, the National Park Service finds that the proposed action would not have any material additional adverse impacts on floodplains and their associated values and that no additional mitigation is required.

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2006 National Water Information System: Web Interface, USGS Water Data for the Nation. Internet website: https://nwis.waterdata.usgs.gov/nwis.

Figure 1. Chattahoochee River National Recreation Area Vicinity Map

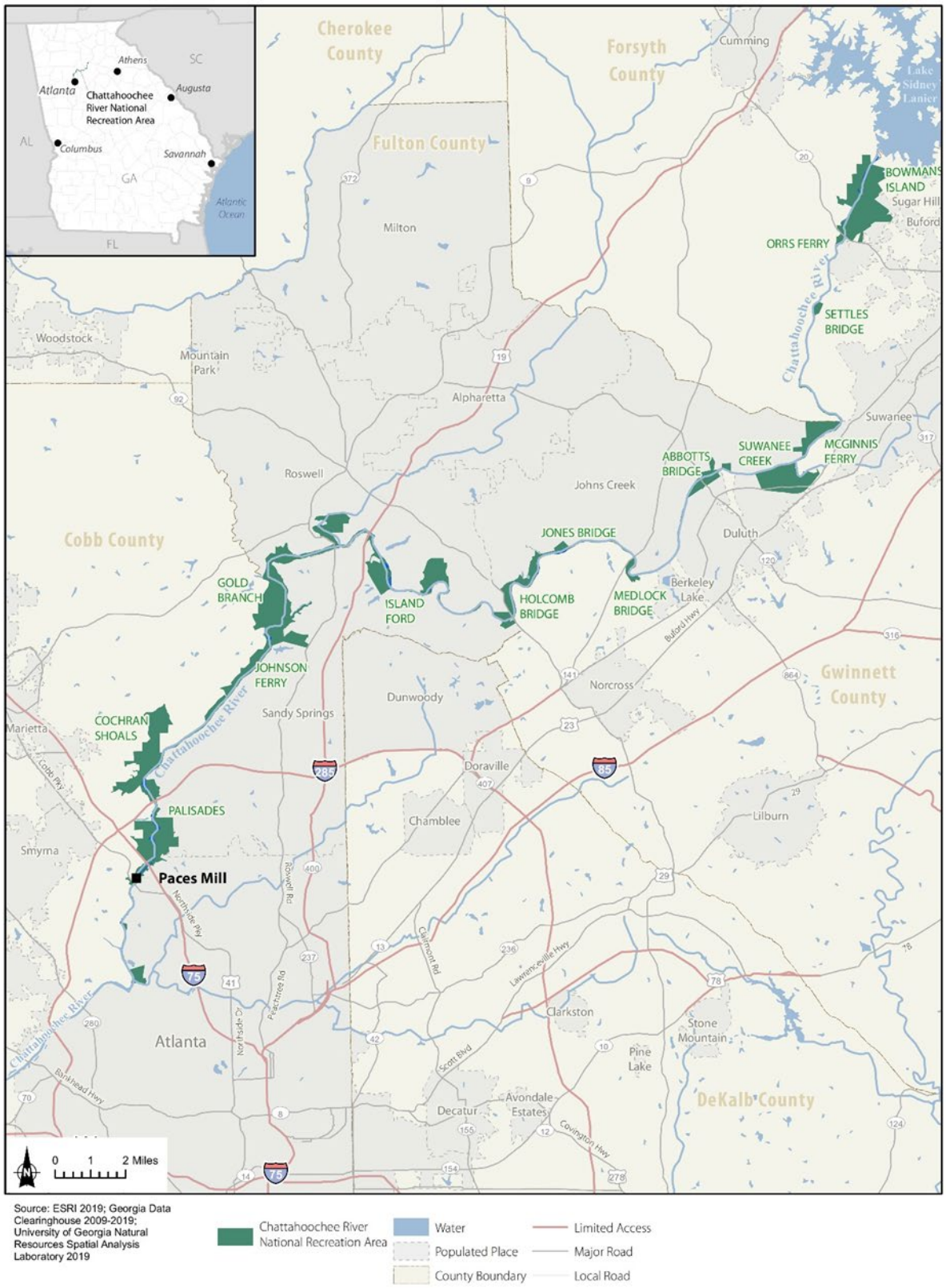


Figure 2. Paces Mill Aerial Photograph and Topography

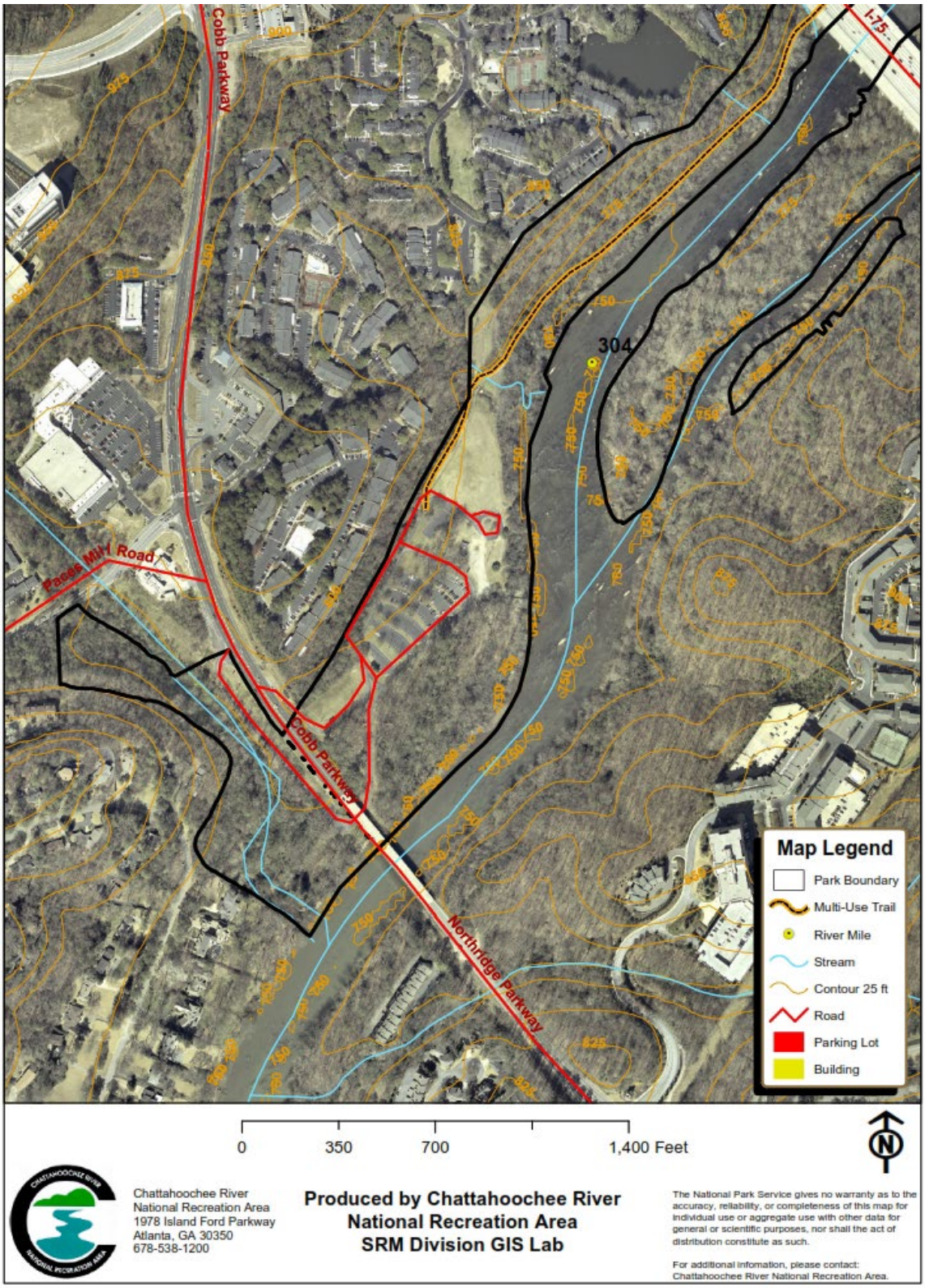


Figure 3. Proposed Action Schematic Design (1 of 2)

Figure 3. Proposed Action Schematic Design (2 of 2)

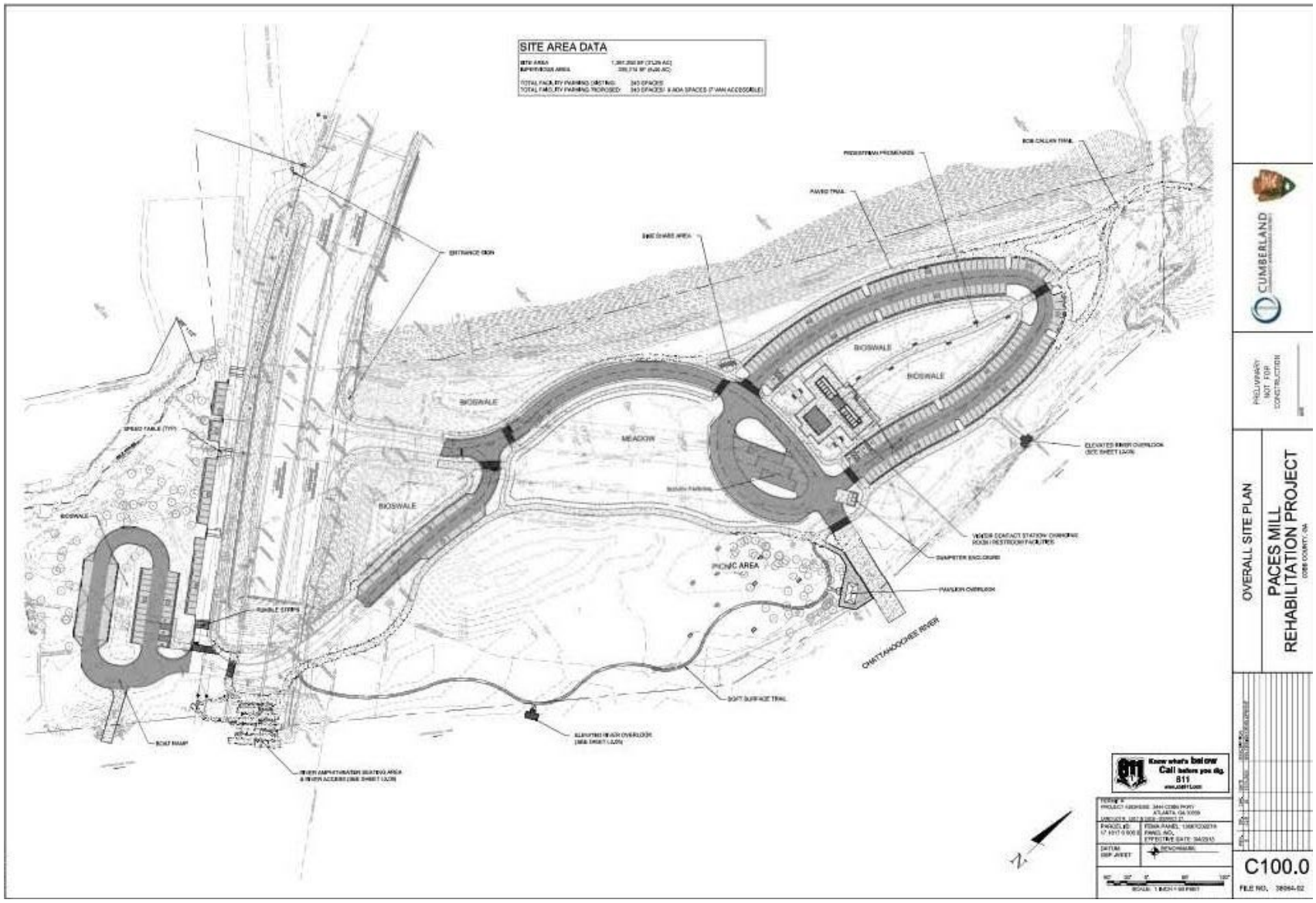


Figure 4. Visitor Contact Station Architecture (1 of 2)

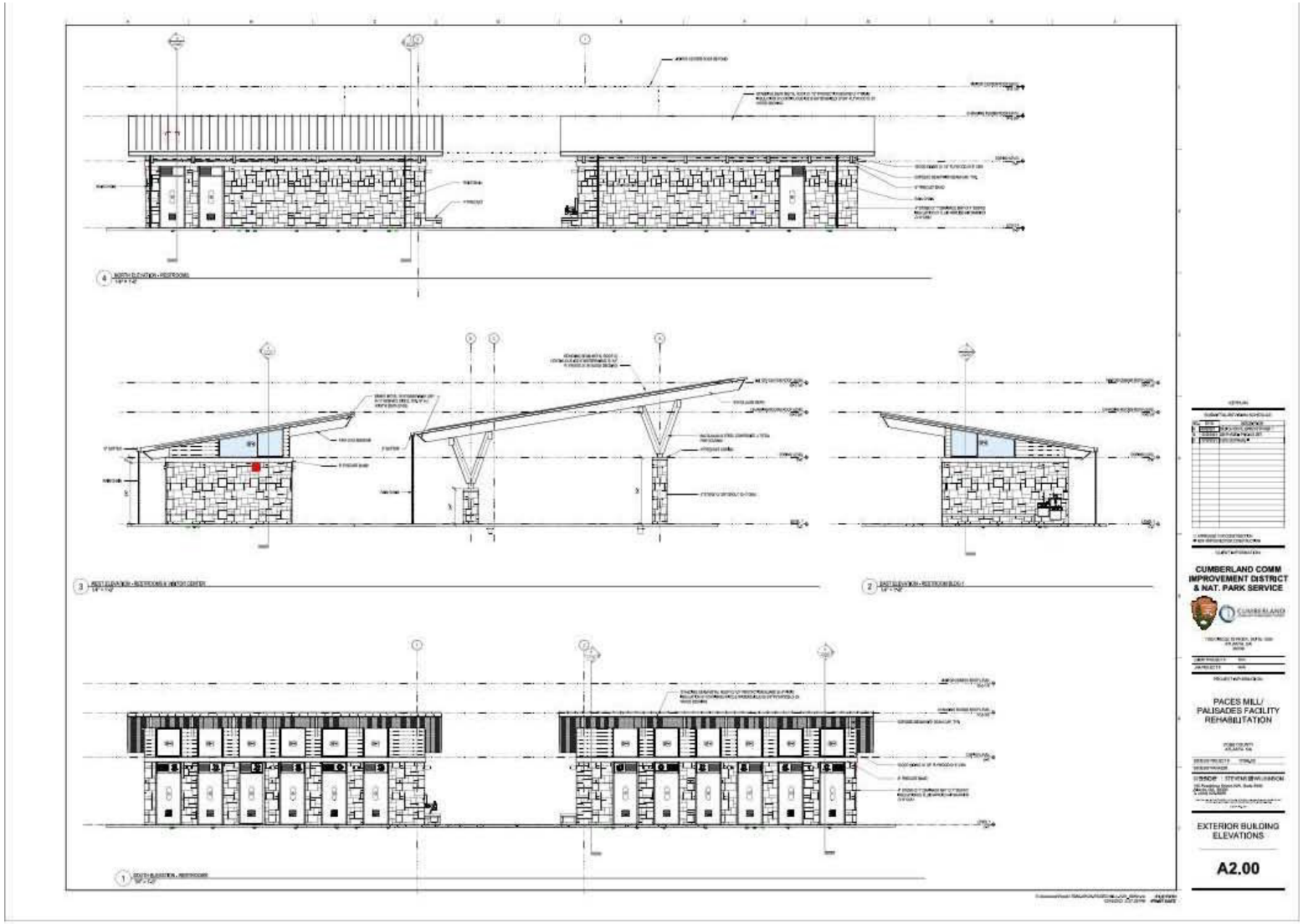


Figure 4. Visitor Contact Station Architecture (2 of 2)

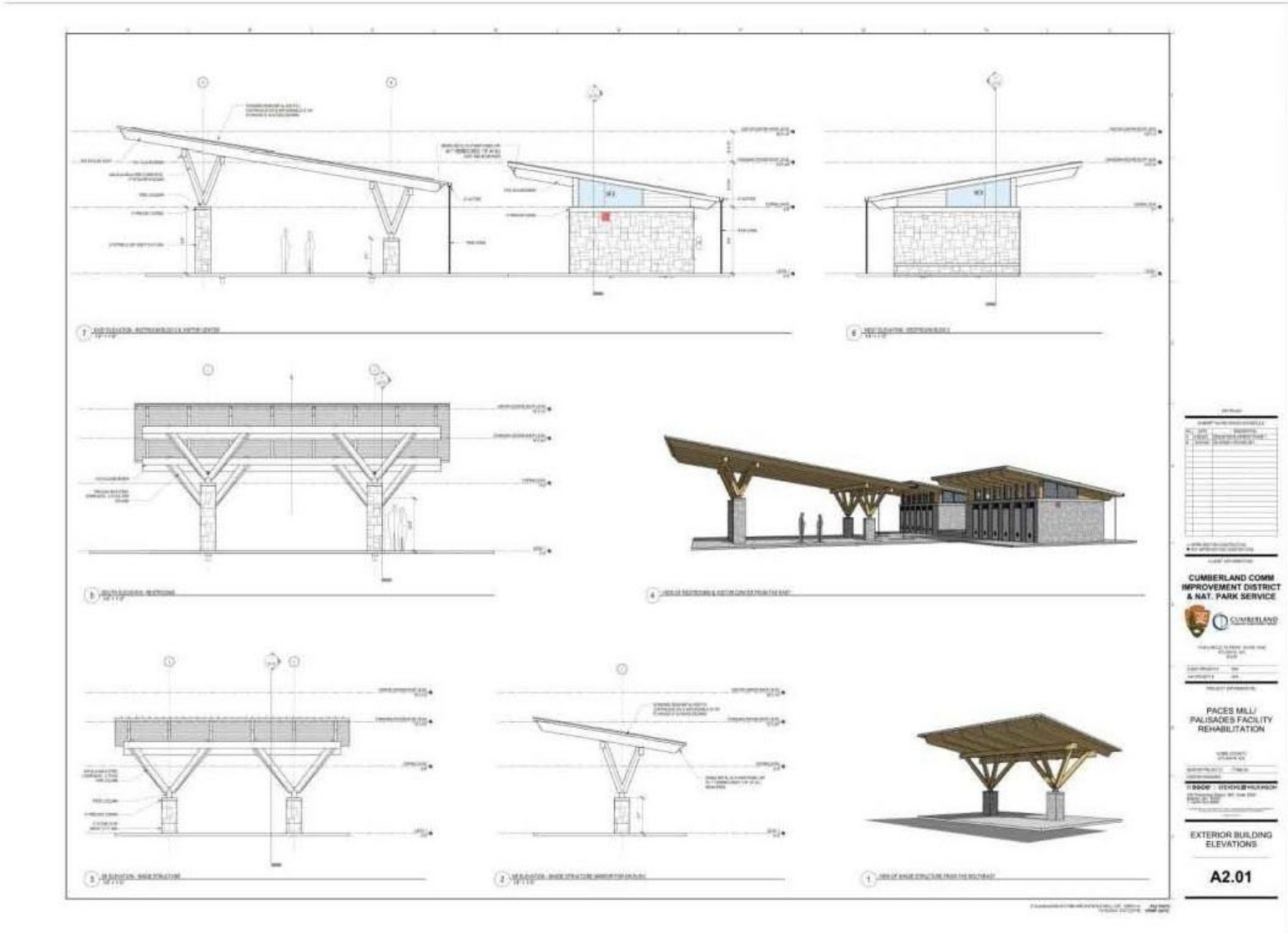
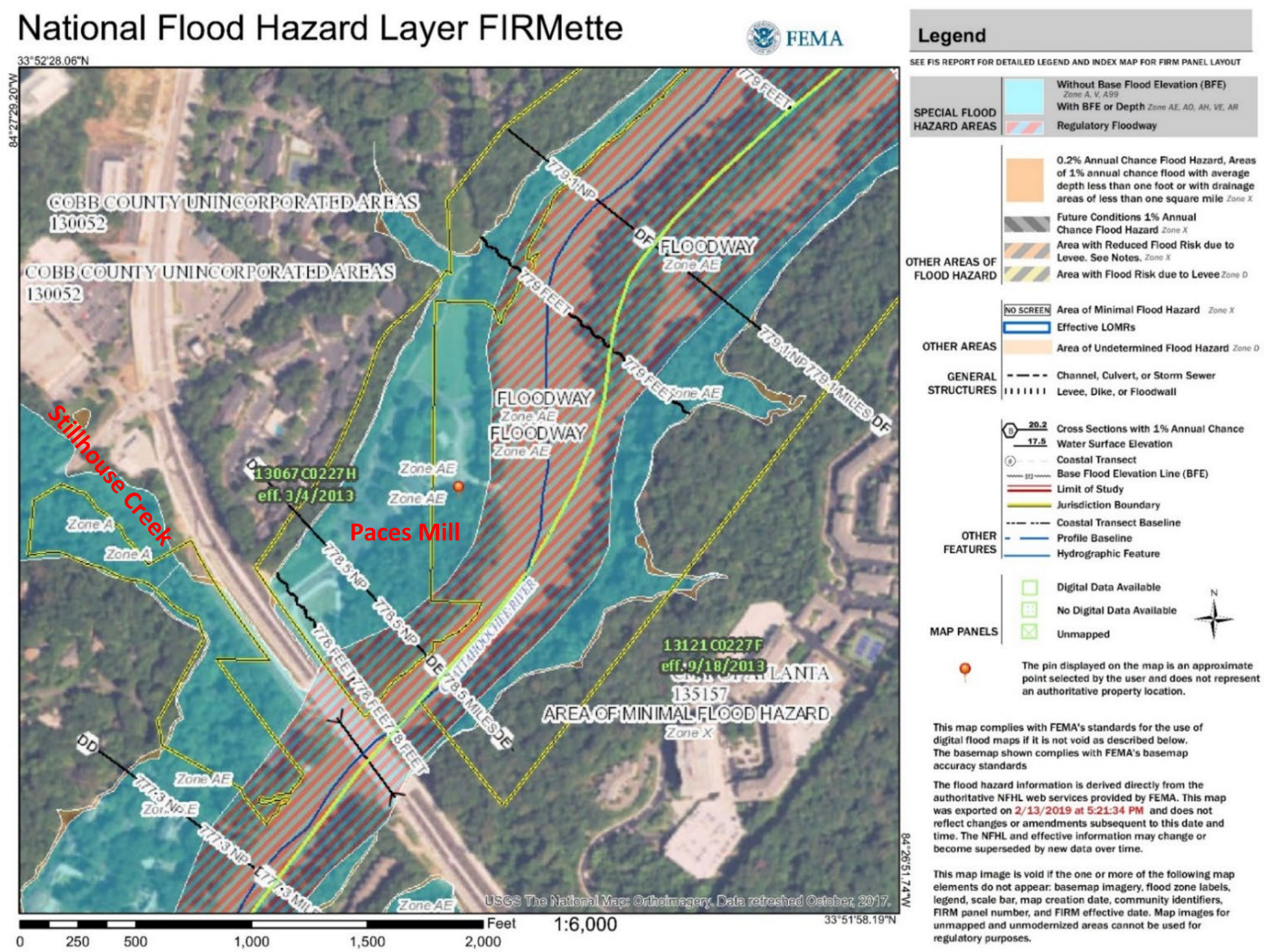


Figure 5. National Flood Hazard Layer FIRMette



Zone A - An area inundated by 1% annual chance flooding, for which no BFEs have been determined.
Zone AE - An area inundated by 1% annual chance flooding, for which (base flood elevations) have been determined.
Paces Mill is primarily in Zone AE with the exception of Stillhouse Creek, which is in Zone A.

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APPENDIX A: WETLAND DETERMINATION DATA SHEETS

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U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***Requirement Control Symbol EXEMPT (Authority: AR 335-15, paragraph 5-2a)***

Project/Site: Paces Mill Chattahoochee River National Recreation Area City/County: Atlanta/Cobb Sampling Date: 12/5/2018

Applicant/Owner: National Park Service State: GA Sampling Point: UPDP-01

Investigator(s): Pat Ferral Section, Township, Range:

Landform (hillside, terrace, etc.): Flood plain Local relief (concave, convex, none): none Slope (%): 0 - 2

Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 33.868745 Long: 84.455627 Datum: NAD 83

Soil Map Unit Name: Toccoa sandy loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UPDP-01

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liriodendron tulipifera*	30	Yes	FACU
2. *Pinus taeda*	20	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	50	=Total Cover	
50% of total cover: 25		20% of total cover:	10
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. *Ligustrum japonicum*	40	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8
Herb Stratum (Plot size: 5' radius)			
1. *Ligustrum japonicum*	40	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8
Woody Vine Stratum (Plot size: 30' radius)			
1. *Lonicera japonica*	10	Yes	FACU
2.			
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	100	x 3 =	300
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	140 (A)		460 (B)
Prevalence Index = B/A =			3.29

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: UPDP-01

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	=Total Cover		
50% of total cover:	20% of total cover:		
Sapling Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
	=Total Cover		
50% of total cover:	20% of total cover:		
Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
	=Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	=Total Cover		
50% of total cover:	20% of total cover:		
Woody Vine Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)
Prevalence Index = B/A =		

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody Plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody Vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPDP-01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	7.5YR 4/4	50					Loamy/Clayey	Mixed fill material
6 - 12	2.5YR 4/8	60					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

No hydric soil indicators.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***Requirement Control Symbol EXEMPT (Authority: AR 335-15, paragraph 5-2a)***

Project/Site: Paces Mill Chattahoochee River National Recreation Area City/County: Atlanta/Cobb Sampling Date: 12/5/2018

Applicant/Owner: National Park Service State: GA Sampling Point: UPDP-02

Investigator(s): Pat Ferral Section, Township, Range:

Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): flat Slope (%): 0 - 2

Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 33.868402 Long: 84.455609 Datum: NAD 83

Soil Map Unit Name: Toccoa sandy loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: UPDP-02

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer saccharum*	20	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. *Ligustrum japonicum*	80	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	80	=Total Cover	
50% of total cover: 40		20% of total cover:	16
Herb Stratum (Plot size: 5' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	20	x 4 =	80
UPL species	80	x 5 =	400
Column Totals:	100 (A)		480 (B)
Prevalence Index = B/A =			4.80

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: UPDP-02

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	=Total Cover		
50% of total cover:	20% of total cover:		
Sapling Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
	=Total Cover		
50% of total cover:	20% of total cover:		
Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
	=Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	=Total Cover		
50% of total cover:	20% of total cover:		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)
Prevalence Index = B/A =		

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody Plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody Vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPDP-02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 10	7.5YR 4/3	95	2.5YR 4/6	5			Loamy/Clayey	
10 - 15	5YR 5/6	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

No hydric indicators.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***Requirement Control Symbol EXEMPT (Authority: AR 335-15, paragraph 5-2a)***

Project/Site: Paces Mill Chattahoochee River National Recreation Area City/County: Atlanta/Cobb Sampling Date: 12/5/2018

Applicant/Owner: National Park Service State: GA Sampling Point: UPDP-03

Investigator(s): Pat Ferral Section, Township, Range:

Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): flat Slope (%): 0 - 2

Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 33.868170 Long: 84.455494 Datum: NAD 83

Soil Map Unit Name: Toccoa sandy loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: UPDP-03

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ligustrum japonicum*	20	Yes	UPL
2. *Acer saccharum*	5	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	25	=Total Cover	
50% of total cover: 13		20% of total cover:	5

Sapling/Shrub Stratum (Plot size: 15' radius)			
1. *Ligustrum japonicum*	20	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Herb Stratum (Plot size: 5' radius)			
1. *Ligustrum japonicum*	20	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Woody Vine Stratum (Plot size: 30' radius)			
1. *Smilax bona-nox*	10	Yes	FACU
2.			
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	15	x 4 =	60
UPL species	60	x 5 =	300
Column Totals:	75 (A)		360 (B)
Prevalence Index = B/A =			4.80

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: UPDP-03

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	=Total Cover		
50% of total cover:	20% of total cover:		
Sapling Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
	=Total Cover		
50% of total cover:	20% of total cover:		
Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
	=Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	=Total Cover		
50% of total cover:	20% of total cover:		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody Plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody Vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPDP-03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	5YR 4/3	100					Loamy/Clayey	
6 - 10	5YR 3/3	100					Loamy/Clayey	
10 - 12	7.5YR 4/6	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

No hydric indicators.

PAT FERRAL

Wetland / Wildlife Biologist

Mr. Farrel has 26 years of experience conducting natural and water resources studies including wetland delineation, protected species surveys, environmental assessments, stream assessments, and water quality sampling. His career includes service as a wildlife diversity biologist with the South Carolina Department of Natural Resources, a consulting forester, wildlife biologist for American Forest Management, Inc. and as an environmental consultant. He is an accomplished endangered species biologist, wetland delineator, botanist, ornithologist and forest land manager.

Selected Relevant Experience

- Conducted wetland delineations and stream assessments for Haile Gold Mine Mitigation Project. Lancaster County, SC.
- South Carolina Department of Transportation, Statewide project responsibility - On-Call Environmental Permitting, Multiple Locations, South Carolina, 2013-14. Assisted with jurisdictional waters of the US/wetlands and critical areas delineations and permitting along roadway improvement projects throughout South Carolina including protected species assessments, alternatives analysis and establishment/survey of critical area lines for coastal waters.
- US-17 Business Management Access Improvement, SCDOT, Surfside Beach, Horry County, SC. Assisted with wetland and vegetative characteristics for US Highway 17 Business at Surfside Beach intersection Improvement.
- Dorchester County Public Works Department, Summerville, Dorchester County, SC. Conducted wetland delineation and vegetative characteristics for roadway improvements.
- I-85 and I-385 Interchange Improvement Project, SCDOT, Mauldin, Greenville County, SC. Conducted wetland delineation, stream assessments and vegetative characteristics for intersection improvements at the junction of US Highway I-85 and I-385. Design - Build permitting services included protected species assessments and review of the alternatives proposed.
- Berkeley County Engineering Department, Holly Hill, Berkeley County, SC. Assisted with wetland delineation and vegetative characteristics for roadway improvements at the intersection of US Highway 176 and the proposed Nexton Parkway.
- Charleston County Transportation Department, McClellanville, Charleston County, SC. Conducted wetland delineation, stream assessment and vegetative characteristics for intersection improvements at the junction of US Highway 17 and SC 45 at South Pinckney Street. Permitting services include protected species assessments and establishment/survey of critical area lines for coastal waters.
- Town of Mount Pleasant Transportation Department, Mount Pleasant, Charleston County, SC. Assisted with wetland delineation and vegetative characteristics for roadway improvements at the intersection of Park West Boulevard and Bessemer Road.

Education

MS, Forest Resources, Clemson University, 1998

BS, Biology, Winthrop University, 1987

Areas of Expertise

Wetland Delineation

Wildlife Biology

Forestry

Natural Resources Management

Threatened and Endangered Species

Fire Ecology and Management

Registrations/Permits/ Certifications

Certified Wildlife Biologist, The Wildlife Society #112043

South Carolina Registered Forester #1554

South Carolina Certified Prescribed Fire Manager #720

Federal Bird Banding Permit and Auxiliary Color Marking Permit #22813 (Inactive)

North Carolina Stream Identification Method Version 4.11, 2017

Advanced Wildlife Hazard Management Training Course, 2016

Hazardous Waste Operations and Emergency Response 40 Hour Training, 2010,

Problem and Atypical Wetland Delineation – Piedmont, D&D WEST, Atlanta, Georgia, 2012

Basic Wetland Delineation, D&D West, Atlanta, Georgia, 2011

Publications

Ferral, Daniel Patrick. 1998. Habitat Quality and the Performance of Red-cockaded Woodpecker Groups in the South Carolina Sand Hills. M.S. Thesis, Clemson University. 74 p.

- Mead WestVaco, Summerville, Dorchester County, SC. Conducted wetland delineation and vegetative characteristics for roadway improvements at the intersection of US Highway 17A and Summers Drive.
- I-26 Corridor Study, Berkeley and Dorchester Counties, SC. Completed jurisdictional waters (streams and wetlands) delineation and Section 404 permitting.
- Georgetown County Department of Public Services, North Litchfield, Georgetown County, SC. Assisted with wetland delineation and vegetative characteristics for the construction of drainage improvements to the intake and outfall of Osprey Lake. Permitting services included protected species assessments and establishment and survey of critical area lines for coastal waters.
- South Carolina Electric and Gas transmission Line Right of Way Expansion, Multiple Counties and Locations, SC. Assisted with wetland delineations for South Carolina Electric and Gas transmission line right of way expansion for the V. C. Summer Nuclear Power Station.
- Independent Engineering Evaluation –Two 19 MW Biomass Plants, Allendale and Dorchester Counties, SC. Assisted with high level technical review and risk assessment of the environmental permits and regulatory issues that impact the projects. Coordinated the consolidation of all environmental responses including air, water, wastewater, T&E species, cultural resources, wetlands, transportation, noise, land use and zoning.
- River Park Tract, Mount Holly, Gaston County, NC. Assisted with wetland delineation, stream assessments and vegetative characteristics for a proposed housing development.
- NC-150 Road Widening Project for NCDOT, Catawba and Iredell Counties, NC. Conducted rare plant surveys for Schweinitz's sunflower (*Helianthus schweinitzii*) and Dwarf flowered heartleaf (*Hexastylis naniflora*), as well as wetland assessments, stream determinations and biological assessment along 13 miles of NC 150.
- TN SR-33 Roadway Widening - Environmental Boundaries Study for TNDOT, Knoxville, Knox and Union Counties, TN. Assisted with wetland delineation, vegetative characteristics and stream assessments along 2 miles of SR-33.
- Haile Gold Mine Stream and Wetland Mitigation, Kershaw, Lancaster County, SC. Conducted wetland delineations, stream assessments and vegetative characteristics. Conducted water quality sampling at various locations in streams associated with proposed compensatory mitigation.
- Verizon Cell Phone Tower Expansion Project, Various sites, NC and SC. Conducted site inspections and wetland delineations at various cell tower locations.
- Kinder/Morgan (TGP) Conversion Project, Multiple Counties and Locations, Ohio and KY. Conducted site characteristics and landscape assessments for workspace determinations within ROW's at selected TGP pipeline taps or main line valve facilities. Surveys were conducted for the presence or absence of endangered and invasive plant species, streams and wetlands.
- Conducted wetland delineation for Orangeburg County Industrial Park.
- Conducted wetland delineations for Haile Gold Mine Mitigation Planning. Lancaster County, South Carolina.
- Conducted site inspections and wetland determination for client, Verizon Cell Phone Tower expansions, in multiple counties in South Carolina.
- Conducted wetland delineation for South Carolina Electric and Gas right of way for natural gas line for Continental Tire Corp., Sumter, South Carolina.
- Conducted surveys of wading bird use of littoral wetland vegetation on cooling reservoirs at Savannah River Site, New Ellenton, South Carolina for NEPA requirements under the Clean Waters Act. Savannah River Ecology Laboratory.