National Park Service
U.S. Department of the Interior



Fort Pulaski National Monument
Development Concept Plan

September 2024







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Development Concept Plan

Georgia

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Chapter 1

Purpose and Need for the Development Concept Plan/Environmental Assessment





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CHAPTER 1: PURPOSE AND NEED FOR THE DEVELOPMENT CONCEPT PLAN/ENVIRONMENTAL ASSESSMENT

INTRODUCTION

This development concept plan (the plan/environmental assessment) provides management guidance for Fort Pulaski National Monument, a unit of the national park system. This plan/environmental assessment was prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 and implementing regulations, 40 CFR Parts 1500-1508 (Code of Federal Regulations) and National Park Service (NPS) Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-Making*, and the NPS NEPA Handbook (NPS 2015a). The plan/environmental assessment considers two alternatives—the no-action alternative and the action alternative—and analyzes the impacts that could result from these alternatives.

The National Park Service is proposing to construct a new facility that would house multiprogram areas and additional parking. These improvements would meet the operational needs of the park, enhance visitor circulation and safety, and improve accessibility. The National Park Service is proposing to undertake this action, recognizing the vulnerability of Cockspur Island to climate change over the next 20 years. Action is needed to reduce operational inefficiencies and relocate facilities that support fundamental resources to more sustainable locations. Acting would also upgrade facilities that no longer meet operational needs and improve accessibility. Lastly, the action alternative includes desired conditions for Cockspur Island, which outline the vision for resource conditions.

PURPOSE AND NEED

The purpose of the development concept plan is to provide comprehensive guidance for improving the park's facility and infrastructure deficiencies on Cockspur Island in the wake of major storm events and continued sea level rise in a manner that protects park resources, is feasible to maintain, is adaptive and resilient to climate change stressors, and enhances visitor experiences.

The fort structure, visitor center, headquarters (Quarantine Station Cottage), entrance station, picnic area, and maintenance building currently provide for most of the national monument's operational needs and visitor facilities. Numerous repairs, renovations, and upgrades to these structures, most of which are historic, have resulted in a patchwork of utility systems and an overall lack of accessible, sustainable, and appropriate spaces to adequately meet the national monument's visitor, staff, and operational needs. Industry standards for accessibility are also not being met.

Some facilities have outlived their life cycle and do not meet current codes and regulatory requirements or the evolving needs of the park.

PROJECT BACKGROUND

Fort Pulaski National Monument exists as one of the best preserved "Third System" US Coastal defense forts built in the early 1800s. The unit was designated in 1924 to include the entire area, comprising the site of the old fortifications that are clearly defined by ditches and embankments, which included approximately 20 acres. The national monument was later expanded to include approximately 5,600 acres, comprising the Cockspur Island Lighthouse, McQueens Island, and the western portion of Cockspur Island.

Today, Fort Pulaski National Monument is experiencing many of the effects of sea level rise, which is predicted to rise as much as 2 feet by 2060 (NOAA 2024). Climate change is already causing increases in temperature, frequency, and intensity of weather events. The predicted sea level rise would, among other things, lead to the loss of land, rising groundwater tables, and saltwater intrusion. Because of Cockspur Island's physical location and historic drainage system, which was designed to maintain the integrity of the island, the national monument and its resources are particularly vulnerable. Sea level rise has the potential to negatively affect gravity-induced drainage in these historic drainage (dike) systems that draw water away from the land on which the fort is constructed. Any increase in groundwater levels could also disrupt the island's drainage. Shifts in water levels have already contributed to flooding in the fort's substructure, as well as increases in mold, dampness, and standing water in many of the national monument's structures.

Recent storms and sea level rise have exacerbated concerns about the long-term sustainability of infrastructure and facilities at Fort Pulaski National Monument. In 2016–2017, the national monument experienced two major hurricanes, Hurricane Matthew in 2016 and Hurricane Irma in 2017, and a tornado in 2017. Even before recent storms, national monument facilities and infrastructure were repaired and patched numerous times to the point where repairs alone are no longer a viable option. In 2019, 27 buildings/structures and 20 transportation assets were assessed for their vulnerability to identified coastal hazards and climate change factors. The results revealed that 89% of the assets have high vulnerability (Tormey 2023). In addition, visitation has also increased, and the infrastructure can no longer keep pace with the growth in visitation and weather-related events. A 2018 accessibility study also identified numerous deficiencies.

The plan will provide direction to park managers on how to address the issues with the facilities so that they will be sustainable and can withstand the impacts of increasingly intense storms and sea level rise. The issues can no longer be solved with maintenance, but rather, a comprehensive look at how the facilities work together and options for making them sustainable are needed.

Project Area

The project area for the plan includes only Cockspur Island. Fort Pulaski is located on Cockspur Island, along with most visitor services and all park operations.

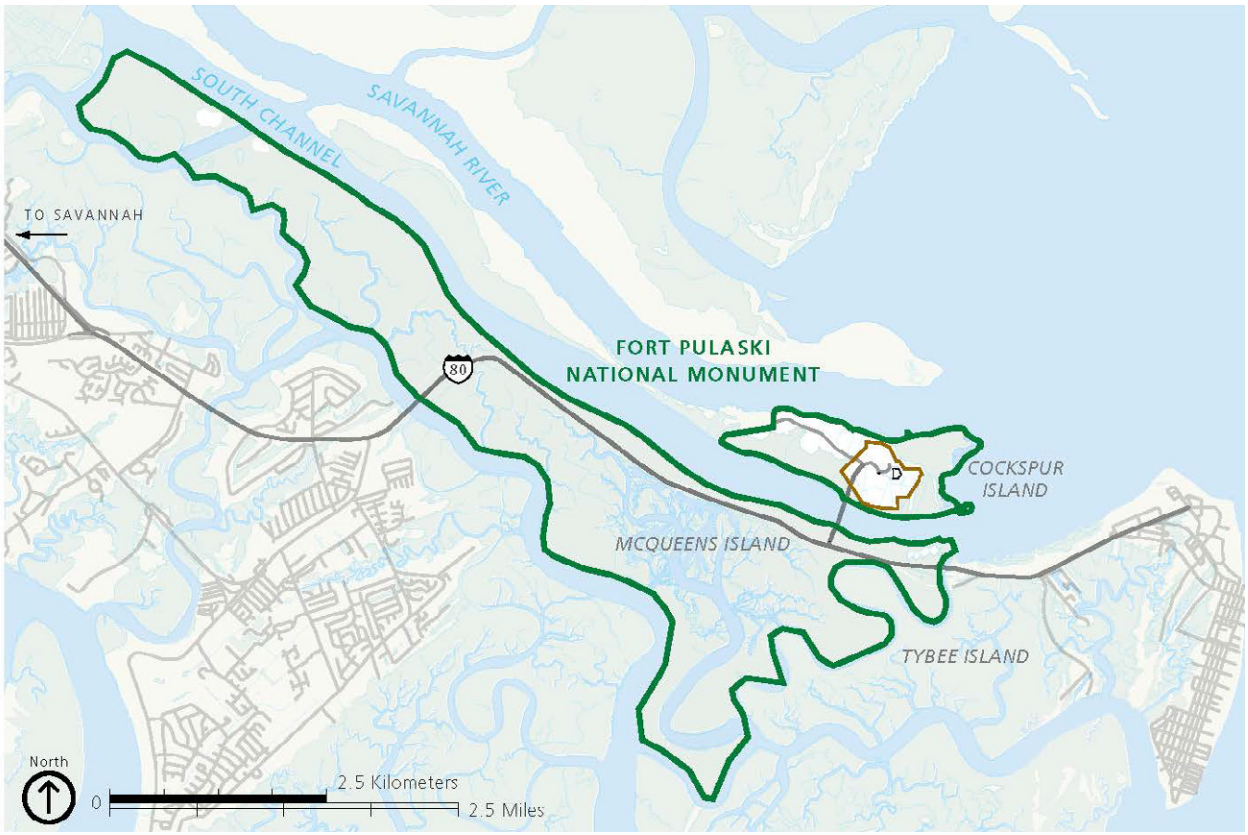


FIGURE 1. OVERVIEW MAP OF FORT PULASKI NATIONAL MONUMENT

PURPOSE, SIGNIFICANCE, AND SELECTED FUNDAMENTAL RESOURCES AND VALUES

The park's purpose, significance, fundamental resources and values, statutory mandates, and NPS *Management Policies 2006* (NPS 2006) are identified in the park foundation document (NPS 2016) and shape and guide what this plan proposes.

The purpose of Fort Pulaski National Monument is as follows:

> *Fort Pulaski National Monument preserves and interprets the 19th-century masonry fort and associated landscape that illustrates the evolution of civil engineering and military technology, a continuum of historic resources from colonial times to the present day, and approximately 5,000 acres of nearly pristine salt marsh on McQueens and Cockspur Islands in Savannah, Georgia.*

The following statements of significance describe the distinctive nature of Fort Pulaski and why it is important within a global, national, regional, and systemwide context. The statements focus on the most important resources and values to assist in park planning and management.

- The bombardment and subsequent breaching of the massive brick walls by federal artillery during the Battle of Fort Pulaski in April 1862 demonstrated for the first time the

tremendous battering power of rifled artillery, bringing to a close the era of impregnable masonry fortifications.

- Constructed between 1829 and 1847, Fort Pulaski is one of the best-preserved examples of Third System masonry coastal fortifications built to protect US harbors following the War of 1812.
- The complex network of dikes, ditches, and drainage systems that still function today made the construction of Fort Pulaski possible in 1829 and influenced the development that shaped Cockspur Island.
- Due to its strategic location where the Savannah River meets the Atlantic Ocean, Cockspur Island, its lighthouse, and its cultural landscape reflect the maritime history and evolution of coastal defense from colonial times to World War II (WWII).
- After the Battle of Fort Pulaski, the fort became a safe haven for freedom seekers from 1862 until the end of the American Civil War.
- Recognized as part of the National Oceanic and Atmospheric Administration's national system of Marine Protected Areas and eligible for federal wilderness designation, Fort Pulaski National Monument preserves approximately 5,000 acres on Cockspur and McQueens Islands of virtually undisturbed salt marshes. This rich and diverse habitat is critically important to the ecological health and economy of the Southeast Atlantic coastal region.

The project area includes two significant fundamental resources and values that are important to this planning process. Fundamental resources and values help focus planning and management efforts on what is truly significant about the park. One of the most important responsibilities of NPS managers is to ensure the conservation and public enjoyment of those essential (fundamental) qualities to achieving the park's purpose and maintaining its significance. If fundamental resources and values are allowed to deteriorate, the park's purpose and/or significance could be jeopardized.

- **Fort Pulaski.** Constructed between 1829 and 1847, Fort Pulaski was one of the series of massive Third System masonry coastal fortifications built to protect the Atlantic seaboard after the War of 1812. The hexagonal fort is situated on 70-foot-long pilings driven into the mud to support wood subflooring and the weight of the more than 25 million bricks used in the fort's construction. The fort's walls, an average of 7.5 feet thick, were considered impenetrable until Union rifled cannons managed to destroy the southeast wall during the 36-hour Battle of Fort Pulaski in April 1862. Following the battle, Union forces took control of the fort, mended the damaged parts of the masonry walls, and occupied Fort Pulaski until the end of the Civil War.
- **Cultural landscape of Fort Pulaski, including the dikes, ditches, and drainage system.** The cultural landscape of Fort Pulaski represents more than 200 years of development and military presence on Cockspur Island. The area is bordered by the 2-mile dike and ditch system developed in the 1830s to prepare the site for construction. Key elements of the cultural landscape of Fort Pulaski include archeological sites and

resources related to the 18th-century Forts George and Greene; the remains of the North Channel Pier; tide gates, channels, and dikes that comprise the historic drainage system; cisterns, foundations, and archeological resources associated with the Workers' Village that was created during the building of Fort Pulaski and its later use as a Contraband Camp for formerly enslaved individuals seeking freedom; the burial site of the Confederate prisoners of war now called "The Immortal 600" and others; Endicott-era Battery Hambright; historic and cultural sounds associated with the island; and the views and vistas along the historic firing lines of the fort. The cultural landscape, furthermore, includes improvements and developments associated with the early 20th-century work of the Civilian Conservation Corp (CCC) and Works Progress Administration (WPA) and the mid-20th-century work of the Mission 66 program.

RELATED PLANNING EFFORTS

- **Rehabilitate ditch and dike system.** The US Army Corps of Engineers (USACE) is leading this concurrent effort to rehabilitate the ditch and dike system to create better flood resilience and protect the heavy masonry fort. This effort would address issues related to protecting the park's fundamental resources and values. The project is being done in phases, with the first section of ditch and culvert rehabilitation completed in spring of 2024.
- **Rehabilitate wastewater system.** This planning effort would overhaul wastewater treatment for Fort Pulaski.
- **Resource stewardship strategy.** This planning effort is being used to set stewardship goals and track progress in achieving and maintaining desired natural and cultural resource conditions. Resource stewardship goals are based on science, law, NPS management policies, and the long-term public interest. This planning effort was recently completed in 2024 as this development concept plan was underway.

IMPACT TOPICS ANALYZED IN THIS PLAN/ENVIRONMENTAL ASSESSMENT

An important part of effective planning is understanding the consequences of making one decision over another. Environmental assessments, such as this document, identify the anticipated impacts of possible actions on resources and on park visitors and neighbors. Impacts are organized by topic, such as impacts on visitor experience, the cultural landscape, and vegetation. Impact topics help focus this environmental analysis. The following impact topics identified for the plan/environmental assessment are based on the issues identified in this document and are analyzed in chapter 3:

- Cultural landscape
- Historic structures
- Archeological resources
- Floodplains

- Wetlands
- Vegetation and soils
- Visitor use and experience

Chapter 2

Alternatives





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CHAPTER 2: ALTERNATIVES

INTRODUCTION

This chapter describes the actions that would take place under the alternatives for the development concept plan at Fort Pulaski National Monument. The environmental assessment includes a no-action alternative, which provides a baseline for comparing with the action alternative, and a preferred action. The elements in these alternatives are described in the sections below. Other alternatives that were considered but dismissed from detailed analysis are also described in this chapter.

ALTERNATIVE A (NO ACTION/CURRENT MANAGEMENT)

Under the alternative A, the no-action alternative, the National Park Service would not make changes to current operations or visitor experience. This alternative includes no planning, design, construction activities, or improvements to address the park's operational inefficiencies and deficient infrastructure—particularly due to climate change impacts on Cockspur Island, including major storm events and continued sea level rise. As physical conditions degrade on Cockspur Island, maintaining the status quo under current management would continue to negatively impact the park's fundamental resources and fail to meet evolving circulation, safety, and accessibility requirements for basic visitor and operational needs.

Visitor circulation. Visitor access would continue unaltered. Visitors would arrive at the entrance gate just off US Highway 80 and proceed into the park to the visitor center parking area or the other parking areas along Cockspur Island Road. At the visitor center parking area, visitors would have to continue to cross traffic to enter the visitor center. Large vehicles would not have designated parking, and a historically planned, surveyed, and delineated but never paved third tier of parking would remain unimproved, with no large vehicle turnaround. Parking at the picnic area would remain unimproved, which does currently not meet accessibility standards.

Administration/maintenance. Prior to storm events, park staff would continue to spend two to four days relocating equipment out of storm-vulnerable locations on-island to Hunter Army Airfield and back again post-storm. The cleanup and reopening of the park after storms and US Coast Guard (USCG) and park partners access to their facilities would continue to be negatively impacted, with equipment and supplies stored in makeshift locations around the park and offsite.

Current facilities would stay the same, with staff and equipment in undersized and makeshift locations. These facilities would be in storm- and flood-prone locations, resulting in the loss of staff hours during the hurricane season, as well as facility vulnerability. Restroom facilities would continue to be unavailable at some staffed park locations, and the existing septic fields would continue to be unable to support current building occupancy.

Park communication systems would stay the same, and some staff would continue to work in temporary trailer facilities. Bus/RV/oversized parking would stay the same.

ALTERNATIVE B (PROPOSED ACTION AND PREFERRED ALTERNATIVE)

The National Park Service is proposing a development concept plan to provide comprehensive guidance for addressing the park's facility and infrastructure deficiencies and identifying desired conditions for resource protection and visitor experiences in the wake of recent storms and continued sea level rise. In addition, some facilities have outlived their life cycle and do not meet current codes and regulatory requirements or the evolving needs of the park.

Desired Conditions

Desired conditions outline the vision for resource conditions, visitor experiences and opportunities, and facilities and services that an agency strives to achieve and maintain in a particular area with detail beyond what has been described in previous planning documents. Desired conditions help park managers answer the question, "What are we trying to achieve?"

Visitors will:

- be able to physically experience Fort Pulaski, regardless of ability, to the greatest extent possible; count the projectiles embedded in the exterior of the fort from the battle; smell the gunpowder from cannon demonstrations; and see the fingerprints of the enslaved workers in the brick with basic amenities
- be informed about changing conditions at Fort Pulaski, such as extreme heat
- be able to experience history come alive with demonstrations, such as cannon firing, that portray the sights and sounds of the period of significance at the fort
- have opportunities to see, hear, and feel predominantly natural environments, with the park serving as an oasis from surrounding urban life
- be able to explore and find unique places throughout the park for reflection and connection

Natural resources will:

- be monitored, protected, and preserved as much as possible from changing conditions and visitor impacts
- be restored for more functional natural systems and habitats, where opportunities allow

Cultural resources will:

- be proactively studied, protected, preserved, and rehabilitated, as needed, to the greatest extent, from changing conditions and visitor impacts
- be preserved in perpetuity with documentation focused on digital access when preservation or adaptation is not possible

Facilities and infrastructure will

- be sustainable, accessible, feasible to maintain, and meet visitor and operational needs in innovative and adaptive ways; and
- ensure that park managers can recruit and retain a diverse workforce with adequate and accessible workspaces.

Vehicular Circulation

The entrance station would be relocated closer to the visitor center and provide a queuing lane for entry. The entrance station would be built north of the current station, past the Cockspur Island bridge and near the fork in the park road, within the ditch and dike system. The park entrance road, which is currently about 24 feet wide, would be widened by approximately 12 feet to 20 feet between the bridge and the fork in the road to provide queuing and an emergency and USCG bypass lane leading up to the station.

A third tier of parking, historically planned, surveyed, and delineated, but never paved, and a large vehicle turnaround would be added at the visitor center parking area. The third tier of parking, currently covered by turf, would be paved with asphalt and striped to match the two other tiers and be most compatible with the landscape. With the original outline of the third tier still visible through the grass, it is unlikely that any major grading would need to take place, but this would be determined in the design phases. Paving the third tier of parking would add approximately 21,000 square feet of pavement, which would accommodate additional standard, bus, and RV parking and the turnaround. Bus and RV parking would be provided in the easternmost section of the parking lots, parallel to the current road alignment. Designated bus drop-off zones would be provided near the visitor center, improving visitor safety. See appendix B for conceptual site plans.

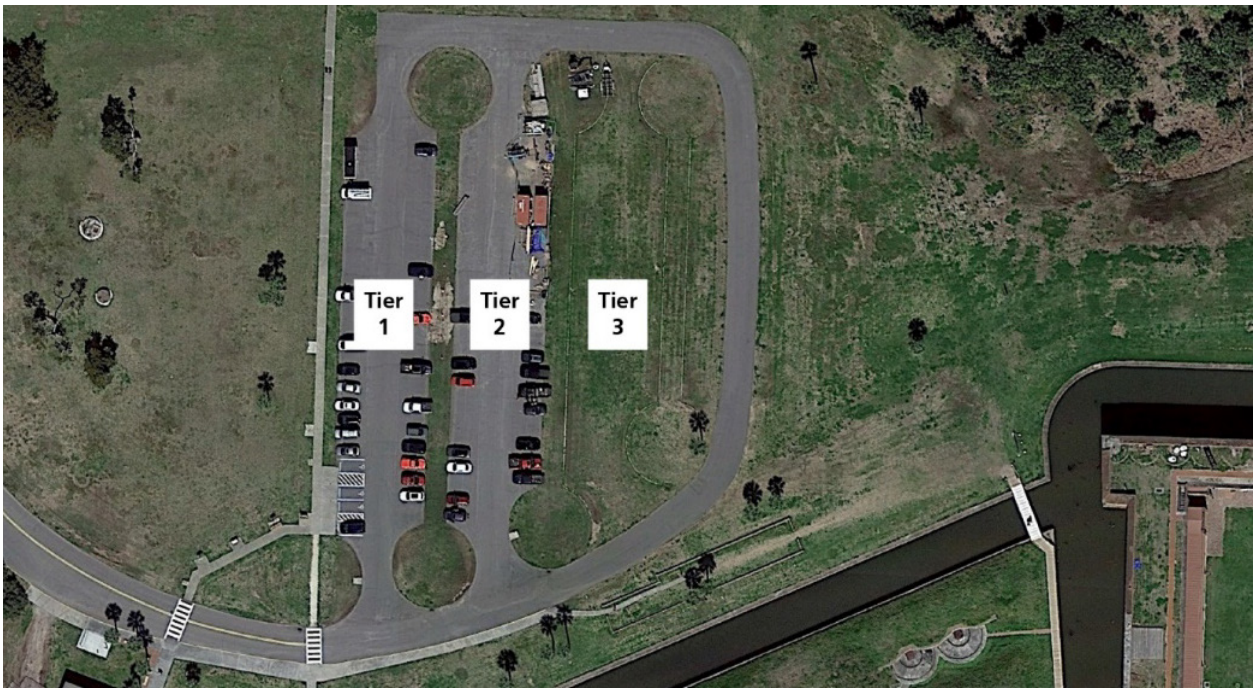


FIGURE 2. AERIAL PHOTOGRAPH SHOWING TWO EXISTING PAVED TIERS OF PARKING AND THE THIRD TIER COVERED IN GRASS BUT VISIBLE

Visitor Facilities

Accessibility standards, per the Architectural Barriers Act (ABA), would be met in the park by improving the picnic area by installing new accessible picnic tables, parking spaces, and a restroom. The new restroom would be sited to the southeast corner of the parking lot to provide enough distance that visitors in the picnic area would not experience fumes. The existing portable and prefabricated toilets are non-ABA compliant and would be removed. An accessible route would connect the accessible parking spaces to the covered and uncovered picnic tables and new restrooms. The improved parking area would also be used as a visitor center overflow and event parking. See appendix B for conceptual site plans.

The Volunteers-In-Parks (VIP) campsites would be relocated in a tree clearing to the west of the current facilities and resources building. The same amenities would be provided in the new VIP campsite location: RV parking spaces with electrical and sewer hookups, tables, and grills. See appendix B for conceptual site plans.

Administrative/Maintenance

A new building would be constructed to house park maintenance, cultural and natural resources, and law enforcement staff and equipment on the south side of Cockspur Island Road. The building would be constructed in the footprint of the area where the VIP campsites are currently located. The topographically higher elevation (i.e., the existing site elevation is approximately 8 feet, and the proposed site elevation is 11 feet) of the new site would provide additional protection from flooding. The current building and associated structures that serve these uses would be phased out as operations move into this new building. The pole barns, fuel

center, and small storage sheds would be retained until they are no longer viable and replaced at a future time. See appendix B for conceptual site plans.

ALTERNATIVES CONSIDERED BUT DISMISSED

During the preplanning and planning phases, many ideas or actions were discussed, but not all are feasible or desirable in this national park unit. Table 1 represents alternatives or actions that were dismissed if they did not support the legislative mandates of the park, the purpose and need, and/or the desired condition for Fort Pulaski.

Table 1. Alternatives or Actions Considered but Dismissed

Action	Reason for Dismissal
Renovating the current maintenance facility	The interdisciplinary team dismissed updating and renovating the current maintenance facility because it would not meet the purpose and need for taking action due to the economic infeasibility of the renovation, and current location is a less-sustainable location with forecasted climate change. The current maintenance facility footprint is not suitably sized for the current facility management and operations staffing. Adding the necessary square footage to bring the building up to required code, as well as increasing the size of the building to hold additional staff members for resources and law enforcement, is not feasible for this location.
Constructing a new maintenance facility in the same location as the existing maintenance facility	This action would have a greater impact on the historic landscape and less-sustainable areas. The action would not meet purpose and need of plan.
Removing the entrance station and collecting fees from the visitor center	This action would have low compliance when the booth is not staffed, and visitors would not comply with the requirement of going into the visitor center to pay the park entrance fee. This system would not capture visitor admissions, which would be against the fee guidelines both for monument and NPS policy.

RESOURCE PROTECTION MEASURES FOR THE PREFERRED ACTIONS

Natural Resources

- Flood risk protections include raising the new administrative and maintenance building above predicted base flood elevations and/or incorporating concrete channels that allow floodwaters to pass through during major storm events. Final designs would integrate base flood evaluation and projected sea level rise to meet National Flood Insurance Program standards and criteria.
- A wetland delineation by qualified NPS staff was performed to document jurisdictional wetlands in the project area for design efforts. If design or construction efforts are

initiated five years after the July 2024 delineation, a field verification must occur and potentially a new delineation for section 404 permitting purposes.

- Sensitive natural areas, such as wetlands, would be avoided during construction. Caution would be emphasized to protect these resources from damage caused by construction equipment, erosion, siltation, and other construction activities.
- A wetlands statement of findings and compensatory mitigation would be required to meet regulatory and procedural requirements before facility development in project sites that include wetlands (see appendix D).
- Any construction or maintenance would be coordinated and supervised per NPS standards. Park staff would be responsible for ensuring that crews perform the necessary work in accordance with NPS instructions and standards.
- Measures would be taken to keep construction and building materials from escaping work areas, especially near waterways.
- Erosion control devices would be used, as necessary, to protect water quality and reduce the potential for stormwater runoff into salt marsh or other wetland areas.
- Disturbed or bare soils at development sites would be revegetated with native seed mixes after large storms.
- Vegetation clearing, such as that proposed for the parking lot expansion work, would be done outside sensitive bird nesting seasons.
- Trash and food wastes would be removed daily from worksites to avoid attracting wildlife.
- If necessary, park managers would use temporary or seasonal visitor use restrictions or area closures to protect sensitive wildlife habitat and sensitive wildlife behavior or life stages from visitor use.
- Noise abatement measures would be implemented during major construction projects. Standard noise abatement measures would include the following:
    - A schedule that reduces impacts on adjacent noise-sensitive uses would be used, and the best available noise-control techniques would be used wherever feasible.
    - Equipment would not idle any longer than is necessary for safety or mechanical reasons.
    - Hydraulically or electrically powered impact tools would be used when feasible, and temporary noise sources would be located away from sensitive habitats.

Cultural Resources

- Archeological surveys would precede any ground disturbance. Archeological resources that are eligible for or listed in the National Register of Historic Places would be avoided

to the greatest extent possible during construction. If such resources could not be avoided, an appropriate mitigation strategy would be developed in consultation with the Georgia Historic Preservation Division and as necessary, Native American Tribal Nations traditionally associated with park lands. If, during construction, previously unknown archeological resources were discovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and, if the resources could not be preserved in situ, an appropriate mitigation strategy developed in consultation with the Georgia Historic Preservation Division and Tribal Nations. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony were discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (25 USC 3001 et seq) (United States Code) and its implementing regulations (43 CFR Part 10) would be followed. If non-Indian human remains were discovered, standard reporting procedures to the proper authorities would be followed, as would all applicable federal, state, and local laws.

- Archeological monitoring during ground disturbance activities would be conducted on a case-by-case basis.
- Park staff would continue to inform visitors and others of the importance of protecting and not disturbing archeological resources and historic resources. Visitors would be informed (through NPS educational and interpretive programs and/or interpretive media products and ranger contacts) of the penalties for illegally collecting artifacts or otherwise causing resource damage.
- Park managers would consult with associated Native American Tribal Nations to ensure that project actions are conducted in a way that respects the beliefs, traditions, and other cultural values of the Tribes who have ancestral ties to park lands. Sensitive, sacred, or traditional use areas would be protected to the greatest extent possible by avoiding or mitigating adverse impacts on ethnographic resources, retaining site confidentiality as appropriate, and continuing to provide Tribal access to resources and places of cultural importance.
- Known archeological sites would be routinely monitored to assess and document the effects of natural processes and human activities on the resources. Archeological resources would be left undisturbed and preserved in a stable condition to prevent the degradation and loss of research values unless intervention could be justified based on compelling research, interpretation, site protection, or park development needs. Recovered archeological materials and associated records would be treated in accordance with NPS *Management Policies 2006*, the *NPS Museum Handbook*, and 36 CFR Part 79.
- To appropriately preserve and protect national register-listed or -eligible historic buildings, structures, and landscapes, all stabilization, preservation, and rehabilitation efforts would be undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995).

- Before taking actions that may impact cultural resources in this plan, an update to the national register documentation for Fort Pulaski National Monument, should be completed (in progress, 2024). This documentation would include a determination of eligibility for resources from the New Deal era, including the entrance road and parking area; the Mission 66 period, including the picnic area, cultural landscapes, and historic structures in the maintenance area; and cultural landscapes in the western portion of Cockspur Island since 1952.
- While no ethnographic resources are anticipated to be impacted by actions in this plan, an ethnographic overview and assessment should be prepared to provide baseline documentation for future planning efforts and management actions.

Visitor Use Management

Alternative B incorporates aspects of the visitor use management framework to develop long-term tools and strategies for monitoring and managing visitor use and experience at the site (IVUMC 2016). These tools and strategies include the identification of indicators, thresholds, and visitor capacities, summarized in appendix C.

Monitoring to ensure that desired conditions for resources and visitor experiences are tracked, achieved, and maintained over time is essential for the success of the plan. Monitoring described in this plan is accomplished by establishing "indicators" and "thresholds" (see appendix C). Because the park is not experiencing high levels of resource damage or impacts on visitor experience related to visitor use, the planning team developed an indicator related to visitor safety using climate change scenario planning. Additional indicators could be developed if impacts on resources or the visitor experience become an issue.

As part of the plan, visitor capacities were identified based on the best available data, including visitation data, professional knowledge about the resources, and key management issues affecting the achievement of desired conditions (see appendix C for detailed visitor capacity analysis). The primary limiting attributes that constrain the Cockspur Island's ability to accommodate use is the visitor experience and sensitivity of the natural and cultural resources. The visitor capacity analysis determined that Cockspur Island can accommodate 700 people at one time while achieving and maintaining the desired conditions. A list of management strategies to ensure that use levels stay within identified capacities is available in appendix C.

Chapter 3

Affected Environment and Environmental Consequences





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CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter describes the affected environment and analyzes the environmental impacts of implementing alternative A (current management) and alternative B (the preferred alternative) on the cultural landscape, historic structures, archeological resources, vegetation and soils, and visitor use and experience. This analysis is the basis for comparing the beneficial and adverse impacts of implementing the alternatives.

METHODOLOGY

The National Park Service based the following impact analyses and conclusions on the review of existing literature and studies on Cockspur Island, information provided by experts in the National Park Service, professional judgments, park staff insights, and public input.

CULTURAL LANDSCAPE

Affected Environment

Fort Pulaski is located on Cockspur Island between the North and South Channels of the Savannah River (NPS 2012). While little is known about Native American use of Cockspur Island, the historic condition of Fort Pulaski is a low-lying island containing a masonry fort and associated buildings, structures, and features. From the time the island was used as a military site, the land was cleared of vegetation, providing views of the ocean, river, and marshes. The landscape partially retains its open character and historic integrity, though much of the western portion of the island, as well as spoil deposits to the east, are covered in a succession of maritime forests. The land is still low lying today, no higher than 10 feet above sea level, with much of the acreage being flooded by seasonal tides. Fort Pulaski provides visitors with dramatic and unique views of the Atlantic Ocean, Savannah River, and surrounding marshland (NPS 2012).

Fort Pulaski National Monument was listed in the National Register of Historic Places in 1975 under criterion A (associated with events that have made a significant contribution to the broad patterns of our history) and criterion C (embodies distinctive characteristics of a type, period, or method of construction, represents the work of a master, or possesses high artistic values). The contributing resources listed in the nomination include archeological, structural, and landscape features dating to several periods and themes (NPS 2011, 2012; Trout 1974). In 2011, a cultural landscape report was completed for the Cockspur Island Historic District, which encompasses all of Cockspur Island (NPS 2011). In 2012, a cultural landscape inventory was completed for the Cockspur Island Historic District, also called the Fort Pulaski Historic Landscape, and listed as the Fort Pulaski National Monument Landscape, which encompasses all of Cockspur Island and Islet (figure 3), in the Cultural Resources Inventory System.

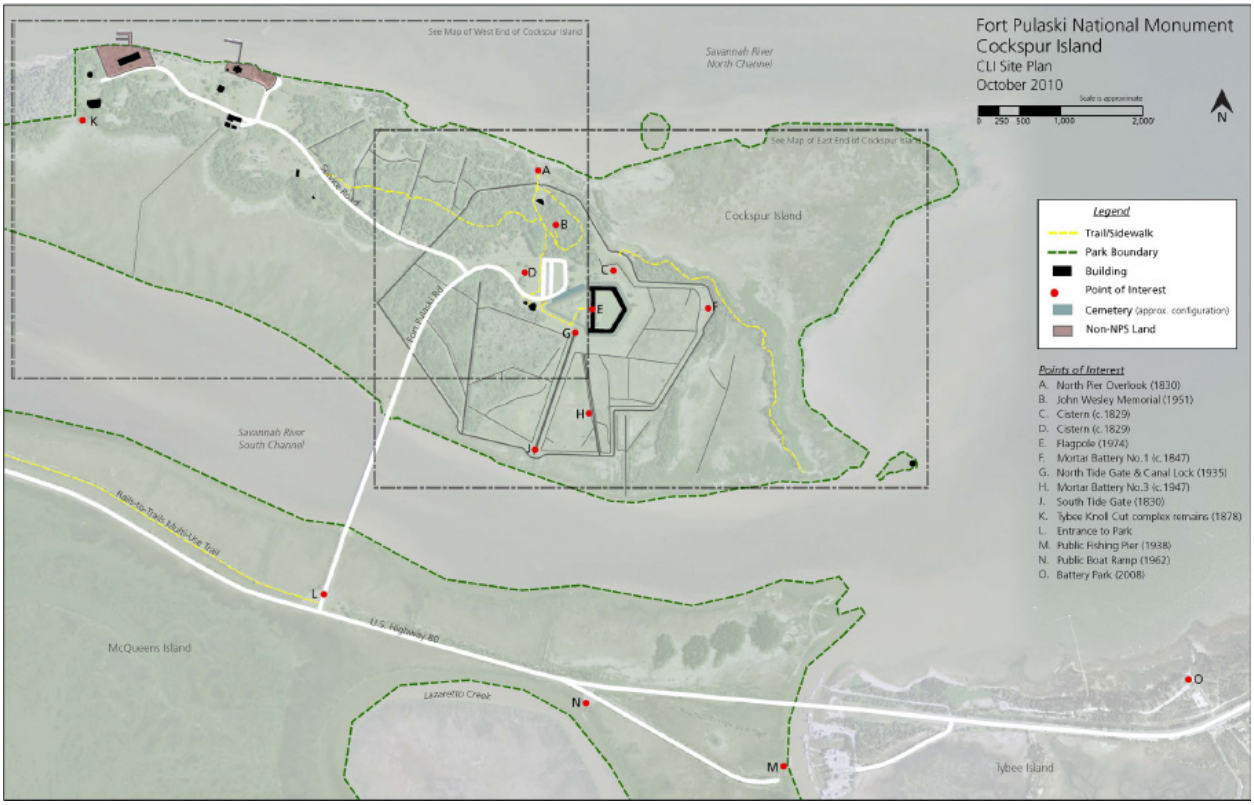


FIGURE 3. FORT PULASKI NATIONAL MONUMENT COCKSPUR ISLAND CULTURAL LANDSCAPE INVENTORY SITE PLAN, OCTOBER 2010 (NPS 2012)

Historic features of the historic district include the fort, the dike and drainage system; the Workers' Village, cisterns; Cockspur Island Lighthouse; Battery Horace Hambright; North Pier; South Channel Bridge (the 1930s bridge is no longer present); World War II Bunkers I and II; the Charles Howard Sellmer Grave; the Lieutenant Robert Rowan Gravestone; the residence; Oil House, and other remnants from the Tybee Knoll Cut Range Lighthouse complex; the garage and John Wesley Memorial; and remnant landscape features at the Quarantine Station site. The cultural landscape inventory recommended that the John Wesley Memorial should be deleted as a contributing feature, as it post-dates the present and proposed period of significance (NPS 2012). The Contraband Camp, possibly located at the site of the Workers' Village, south of the North Channel Pier and northwest of the fort's demilune, was not included in the cultural landscape inventory. Little remains today of the village and camp (NPS 2022b, 2020, 2012a; Seifert, Matera, and Long 2023), and park staff have undertaken recent research to learn more about the village and camp, which housed the people who built the fort and later hospital patients, the self-emancipated "contrabands," officers' families, and more before the village was demolished by the 1881 hurricane. A 2022–2023 archeological project identified some specific structures, activity zones, and artifacts to inform about the lives of the people who built Fort Pulaski and increase the park's interpretation and management decisions regarding land use (Seifert, Matera, and Long 2023).

The 2012 cultural landscape inventory identified an updated significance statement for the national register listing of Fort Pulaski National Monument, as follows: "Cockspur Island is

dominated by the massive Fort Pulaski and surrounding dike and ditch system, with the associated construction village site and North Pier nearby. These features gain historical significance for being home to the first military assignment of Robert E. Lee (Criterion B); as an impressive engineering and architectural marvel that was seemingly impregnable at the time (Criterion C); and as the site of a Civil War siege by Union troops that ultimately proved that impregnability to be false, with the use of the newly patented rifled cannon (Criterion A). The island holds archeological potential (Criterion D) for related features – including earlier forts, the construction village, and South Pier – whose above-ground presence has not survived. Other extant significant features at the property include the Quarantine Attendant's Quarters, Battery Horace Hambright, two World War II bunkers, and numerous trails and roadways. Cockspur Islet is home to Cockspur Island Lighthouse, which survived the Battle of Fort Pulaski intact and is a notable example of 19th-century architecture (Criteria A & C)" (NPS 2012). Updates to this statement during this planning process include acknowledging that cisterns are still present and have an above-ground presence.

Finally, the 2012 cultural landscape inventory recommended two periods of significance for the Fort Pulaski Historic Landscape. The primary period of significance is 1829–1900, which includes the building of the fort, its use during the Civil War, the construction and use of Cockspur Island Lighthouse, and the later use of the island as a quarantine station and Spanish-American War fortification. A secondary period of significance of 1933–1942 accounts for the New Deal (Civilian Conservation Corps and Works Progress Administration) improvements on the island, as well as its WWII features (NPS 2012). In 2015, a multiple property nomination for Mission 66-era resources across the National Park Service listed Fort Pulaski as having Mission 66-era resources. The multiple property nominations included the historical contexts of the pre-Mission 66 era, 1945–1955; the Mission 66 program, 1956-1966; and the Parkscape USA program 1967–1972 (Carr et al. 2015). The park has Mission 66 planning documents documenting the work completed during this period (NPS 1957), and staff are currently working on an updated national register nomination that would extend the period of significance of the Fort Pulaski National Monument landscape from the period of the earliest forts (1761) through the Mission 66 era.

The New Deal improvements of the site included removing vegetation from the fort's walls and parade ground, partially excavating the main drainage ditch, improving drainage and mosquito control, building 5 miles of trails on the island, and rebuilding the dike systems. In 1937, CCC and WPA workers constructed a bridge across the South Channel and built roadways connecting it to the fort. On the west side of the island, they also built a maintenance area (1935 and 1940). The maintenance area is a cluster of three buildings consisting of the frame maintenance building (1935), masonry gas house (1960), and frame pole shed. The maintenance facilities were expanded in the 1970s, and other additions and repairs have occurred since 1993. Most of these improvements and circulation features from the New Deal era remain in place today and together comprise a significant example of New Deal development (NPS 2011, 2012, 2013).

Separate from the New Deal work, park staff completed necessary NPS planning in the 1930s and 1940s. A major focus of the 1939 master plan was the further development of the entrance road to the park; the completion of a parking area north of the fort's demilune, which comprised

parking tiers and an overflow parking area; the completion of pedestrian circulation paths; and the paving of the secondary road leading to the former quarantine station (1889–1937) on the west end of the island. The main parking area, consisting of two of the parking tiers, had been completed by 1940, as shown on the general development plan map (1940) (figure 4). A small parking area, which was to be used temporarily while the main parking area was completed, was located immediately south of the drawbridge. The small parking area was retained until the 1970s, when the roadway leading to it was removed. With the closing of the CCC camp in 1941, park staff began to revise the 1939 master plan. By 1942, the main parking area had been paved, and a new master plan proposed the construction of new buildings on Cockspur Island's west end to accommodate park staff, a utility group, and firefighting needs (NPS 2003b, 2012). The main visitor center parking area is contributing to the Cockspur Island cultural landscape (NPS 2012). While not explicitly mentioned as constructed during the CCC era of the park, a walkway connecting the main parking area to the drawbridge was noted but not restored as part of the 1948 park and trail improvements that occurred immediately following World War II. The superintendent documented the park's trail system as being designed in 1934 and, "by 1937, all trails that now exist had been laid out with a base course of oyster shell" (NPS 2012).

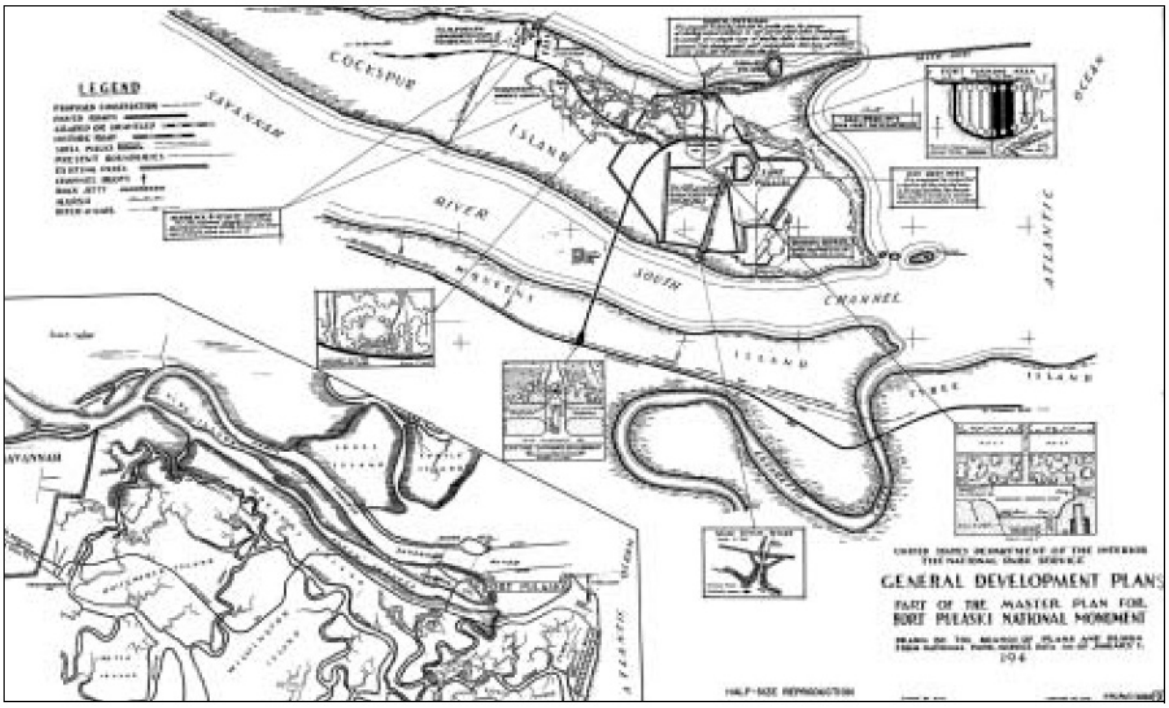


FIGURE 22. General Development Plans drawing illustrates proposed development, c. 1940

FIGURE 4. GENERAL DEVELOPMENT PLANS DRAWING ILLUSTRATING PROPOSED DEVELOPMENT OF FORT PULASKI, CA. 1940 (NPS 2003B, 50, FIGURE 22).

The New Deal's work ended in 1941 with the United States' entrance into World War II. The US Navy established a base on Cockspur Island, using some of the structures from the quarantine station and the CCC camp (Camp 460, 1934–1942, east of the quarantine station). The US Navy also built a large complex to support their operations (US Section base in figure 5). By 1943, the US Navy built bunkers in response to World War II. These bunkers remain today, two of which are located on NPS property, and are significant for their military association. The US Navy and

the Coast Guard continued to use the complex until 1946, when the park was returned to NPS management, though it was not until 1954 when the west end of Cockspur Island was returned to the National Park Service. The National Park Service had, though, begun demolishing and selling 36 of the structures associated with the quarantine complex, CCC camp, and Navy complex, and by 1952, the National Park Service only retained 8 structures for park purposes in this western area of Cockspur Island (NPS 2010, 2011, 2012, 2013, 2022).

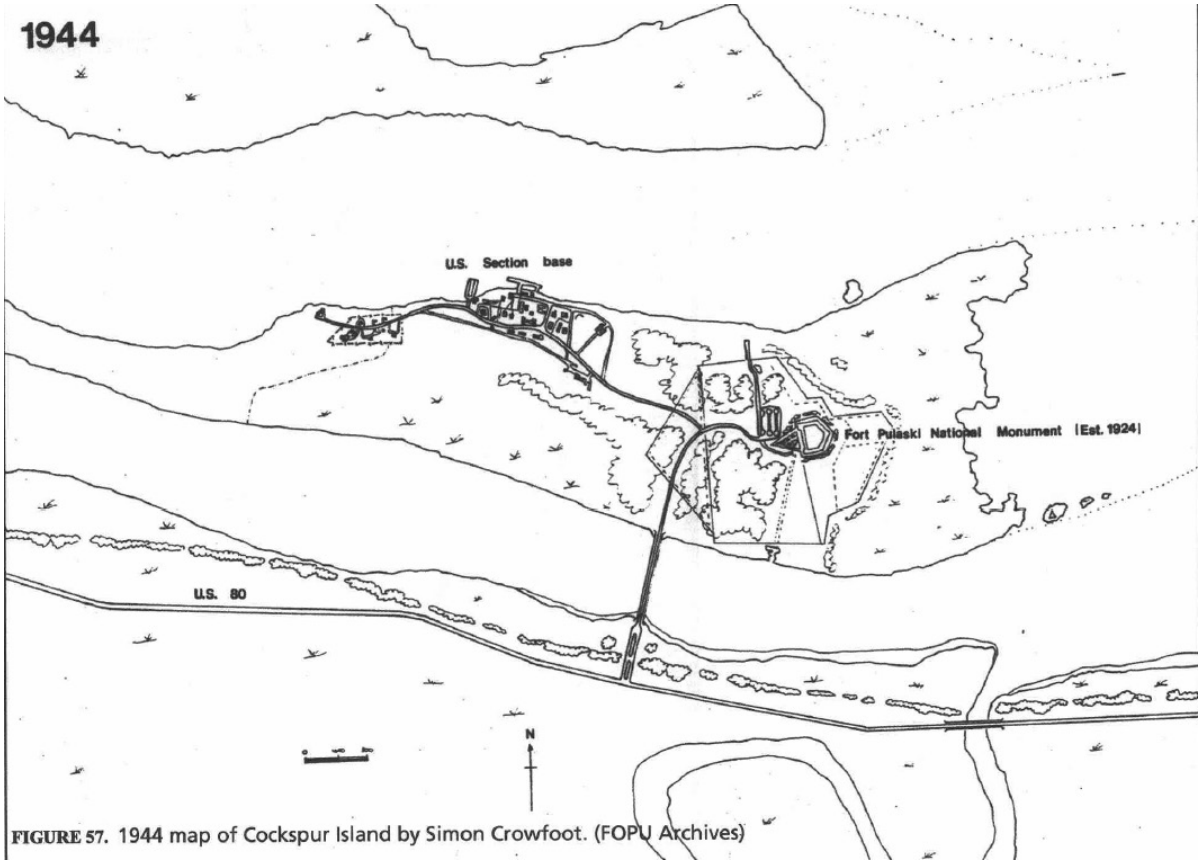


FIGURE 5. 1944 MAP OF COCKSPUR ISLAND BY SIMON CROWFOOT (NPS 2011, 42, FIGURE 57)

Remnants of the spatial organization that once connected the quarantine station (begun in 1889) buildings in the complex remain on the west end of Cockspur Island but with only the Quarantine Attendant's Quarters surviving (built in 1900, remodeled in 1942, and now serving as park headquarters).The integrity of the setting has been lost. The two WWII bunkers built in 1943 by the US Navy are not mentioned in the national register nomination but are located in the Shadow List of Classified Structures "Shadow" database. With the proposed secondary period of significance from the 2012 cultural landscape inventory, the bunkers should be considered contributing resources to the cultural landscape (NPS 2012).

In addition to the quarantine station, CCC Camp 460, and WWII use, there have been other historic uses on the western end of Cockspur Island. The Savannah Bar Pilots moved their operations to the west end of Cockspur Island in 1940, and in 1973, they demolished their historic buildings and built a new dormitory and dock at the same location. The Coast Guard also used the area in the 1940s, and they established a search-and-rescue station in 1983 (NPS

2003b, 2011, 2012). The USCG facilities (interagency agreement) and the Savannah Bar Pilots headquarters (lease) are located on NPS land within the park boundary. The contributing status of the USCG facilities and the Savannah Bar Pilots headquarters have not been determined (NPS 2012). The Savannah Bar Pilots anticipate moving their operations to an area outside of the NPS boundary in the next 5 to 10 years.

Following the wartime closure and subsequent neglect, the park received Mission 66 support through the construction of a new visitor center (though not part of the park's original Mission 66 prospectus), which opened to the public on October 25, 1964. Other Mission 66 improvements focused on fort and demilune repairs, other grounds repairs, improvements to the drainage and dike system, repairs to Battery Hambright and the South Channel Bridge, road and parking area improvements, and improvements to the water, power, and telephone systems. Although a new road alignment was indicated on a 1944 map (figure 5 above), and the alignment was also indicated on the 1960 general management plan map (figure 4, eTIC 348-2010c), the parking area road was realigned in 1962 to pass by the visitor center. Three of the seven parking tiers were also delineated as indicated on the 1960s map (figure 6 below) (NPS 1957, 1960, 1961, 1964, 2011, 2012, 2019b).

Mission 66 philosophy placed an emphasis on interpretation and visitor orientation, and the new road alignment allowed visitors to be dropped off in front of the visitor center before entering the parking area. From the visitor center, concrete walkways provided an all-weather surface to the fort. Asphalt walkways existing before Mission 66 efforts, which connected the fort with the parking area and cemetery, were retained. In 1963, roads and trails were resurfaced, and in 1972, asphalt walkways were replaced with a pebble aggregate mixture to achieve a more historic appearance. In 1975, the walkway at the visitor center was realigned to direct people into the main entrance. In 1977, an accessible ramp was constructed at the west entrance, and a section of walkway was added to connect the walkway to the parking area, with the walkway leading from the west entrance to the fort. In 1984, park roads and trails were resurfaced. In 1993, the asphalt walkway leading to the cemetery was resurfaced in concrete with a broom finish to match the existing walk to the main visitor center entry. The North Pier Trail (also known as the Nature Trail), which was established in the 1930s, was resurfaced with a chip seal treatment beginning north of the visitor center parking area in 1995. The North Pier Trail (Nature Trail) is a contributing feature to the cultural landscape. A section of the trail north of the cemetery was removed and the area scarified and reseeded in grass in the 1990s (NPS 2012).

As documented in the 2012 cultural landscape inventory, the park has a variety of pedestrian-oriented routes. From the visitor center and parking lot, an exposed aggregate walkway leads east to the entry of the demilune and fort. This walkway is noncontributing but compatible with the cultural landscape. In 2007, park staff changed the layout of the walkway from the parking lot to funnel visitors more directly to the visitor center. The compatibility of this sidewalk and signs was not discussed in the 2012 cultural landscape inventory. A portion of the walk was removed and the surface changed to oyster shell as a reflection of the Civil War-era roadway to the South Channel. The oyster shell walkway to the visitor center is noncontributing but compatible to the cultural landscape. In 2012, a concrete walkway was added, connecting the existing concrete walkway around to the visitor center to the exposed aggregate walkway to the

fort. The walkways around the visitor center and heading east to the cemetery are concrete, and the walkway to the cemetery is noncontributing but compatible with the cultural landscape (NPS 2012).

The development of the picnic area in a small, planted slash pine grove to the west end of Cockspur Island took place in 1965 as part of the approved master site plan (NPS 1957, 1960, 1961, 1964, 2011). A fee collection station was proposed at the entrance to the park to help with congestion caused by visitors going to the visitor center to pay the entrance fee (figure 6) (NPS 2011, 2012).

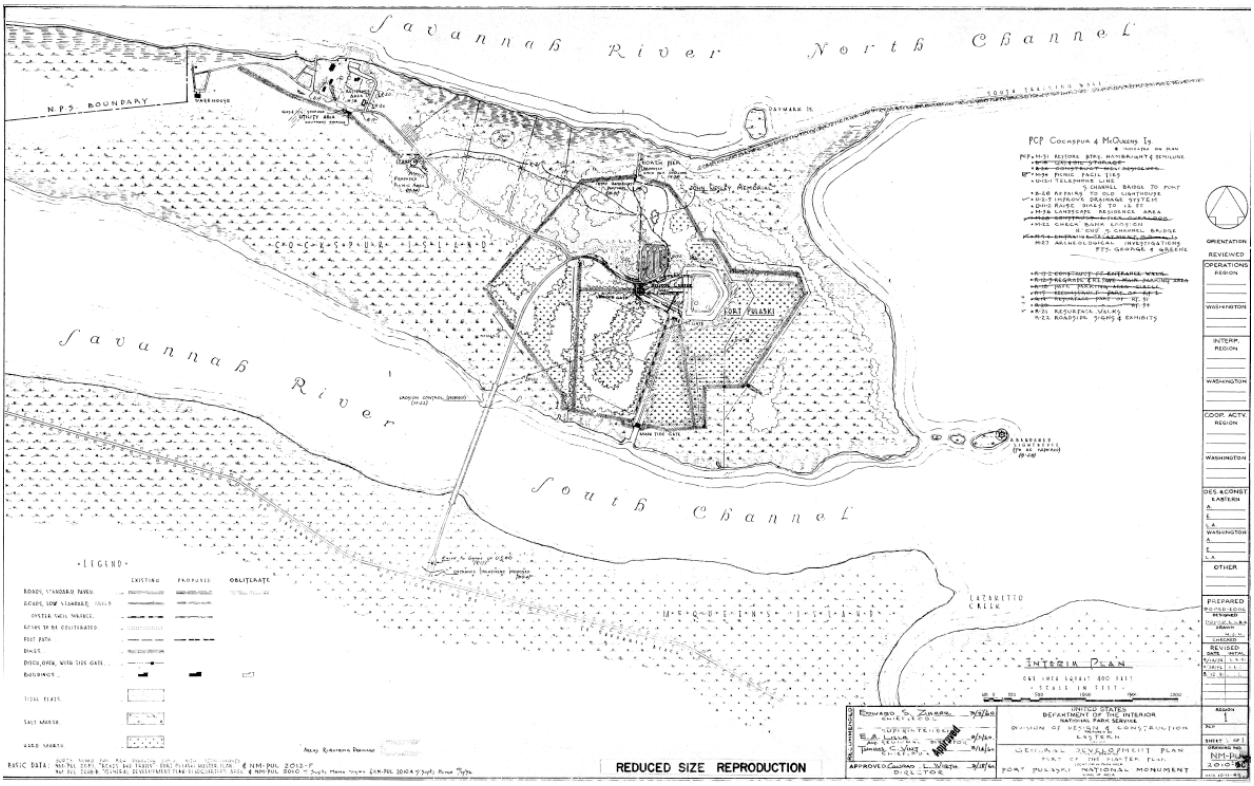


FIGURE 6. GENERAL DEVELOPMENT PLAN, 1960 (DENVER SERVICE CENTER ETIC 348/2020C) (NPS 2011, 38, FIGURE 49)

A variety of basic maintenance improvements have been made to the historic resources in the historic district since the 1970s, including trail resurfacing, new structures, repair of the historic ditch and dike system, repairs to historic structures, and more. At the visitor center, modifications were made to enhance the historic character of the landscape and fort, though park archives do not document specific projects or ongoing maintenance. The visitor center underwent major renovations in the 1990s and 2000s, including the replacement of concrete sidewalks around the building with exposed aggregate concrete and the addition of an exterior restroom facility (NPS 2011, 2012, 2013, 2019b).

At the western picnic area, a non-ABA-compliant prefabricated restroom was added to the picnic area in 1985. This restroom was closed temporarily in 2016 due to flooding and damage from Hurricane Matthew. Following the storm, park managers noticed septic failure as a result of rising groundwater levels due to climate change, and the restrooms were permanently closed.

In 2004, a picnic shelter was added to the picnic area, and a metal roof added to the restroom building (NPS 2011, 2012, 2013). In 2021, the picnic shelter was enclosed with white siding. As part of the general management plan, this picnic area was established as a recreation zone. Decorative wooden enclosures screen dumpsters at the picnic area (NPS 2011, 2012, 2013). The parking lot consists of a turf surface that has been eroded. This surface treatment is inefficient and requires significant routine maintenance. The Coast Guard added new gravel to the parking lot during the construction of the pump house in 2024. Two portable toilets are located in the parking area, and a variety of styles of picnic tables with concrete bases are located in the planted slash pine area.



FIGURE 7. VIEW OF PICNIC AREA PARKING AREA AND PORTABLE TOILETS (LEFT), PLANTED SLASH PINE WITH A VARIETY OF PICNIC TABLE STYLES AND CONCRETE PADS, AND PREFABRICATED RESTROOM STRUCTURE (RIGHT) (NPS 2023)



FIGURE 8. VIEW OF PICNIC AREA PLANTED SLASH PINE SHOWING PICNIC TABLE STYLE VARIETY, CONCRETE PADS, AND PREFABRICATED RESTROOM STRUCTURE (NPS 2023)

Located in the former quarantine station and US Navy complex and established as an administrative services zone in the general management plan (NPS 2013), the quarantine station attendant's cottage was converted into the monument's administrative headquarters (1999–2002). As part of this conversion, park managers requested funding to relocate two VIP trailer pads and associated utilities away from the park's headquarters building across the service road, still within the administrative services zone, to restore the vista from the park's headquarters building. The funding request also called for the construction of an additional pad, a septic system, utility lines, and landscaping. In 2006, the project was funded, and four VIP concrete pads, utilities, and a septic system were added west of park headquarters across the service road (NPS 2011, 2012, 2013). Finally, the Coast Guard recently completed the construction of a new operations facility (2024) in the area immediately north of the 2006 VIP location (figure 9).

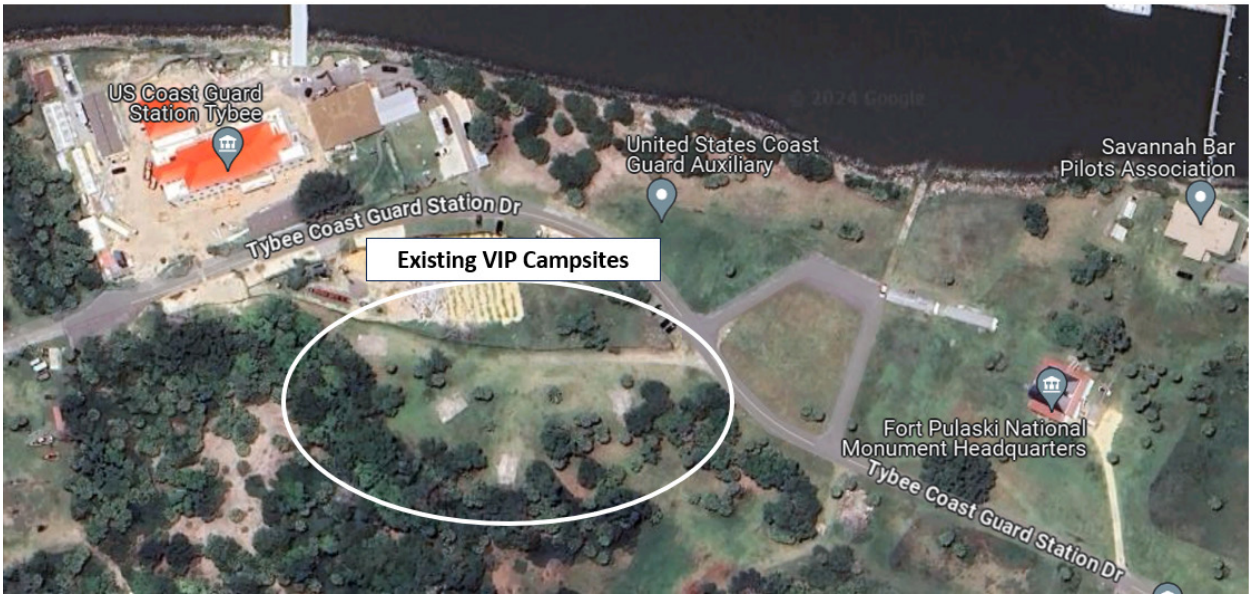


FIGURE 9. WEST END OF COCKSPUR ISLAND WITH EXISTING INFRASTRUCTURE

As of the 2012 cultural landscape inventory, the condition of the Fort Pulaski Historic Landscape was documented as "fair," and its management category was documented as "must be preserved." A 2022 reassessment of the cultural landscape also found the condition of the cultural landscape to be "fair," and its management category was documented as "must be preserved and maintained." Adjacent lands contribute to the cultural landscape and enhance the overall setting of this historic property. Physical intrusions, however, such as US Highway 80 and the South Channel Bridge, have spoiled views of the island and water. The Savannah River, which surrounds Cockspur Island, has evolved as a transportation route. River traffic operates off the north shore, where the river has been dredged by the Corps of Engineers. These dredging efforts have nearly doubled the island's size since when Fort Pulaski was built, and essentially, Cockspur Island is an anthropogenic landform, transformed from the original hammock (figure 10). The river continues to operate as a natural transportation route, and modern ships pass within view of Fort Pulaski National Monument daily (NPS 2012; Seifert, Matera, and Long 2023).



FIGURE 10. FORT PULASKI NATIONAL MONUMENT COCKSPUR ISLAND'S HISTORIC SHORELINES FROM 1852 TO PRESENT

The overall integrity of the Fort Pulaski National Monument landscape remains high for location, design, materials, workmanship, and association. Vegetation succession has compromised the integrity of the setting and feeling, and the loss of most features from the Workers' Village and Contraband Camp compromises the integrity of the association. The integrity of historic circulation patterns is somewhat intact, though changes have lowered the integrity of feeling. The historic alignment of the roadway from the North Channel Pier to the demilune has been preserved as a part of the Loop Trail, constructed in the 1930s. The integrity of the original roadway from the South Channel Pier to the demilune has been compromised, but its trace can still be detected in the dike system (NPS 2020, 2012) (compare figure 11 and figure 12 below).

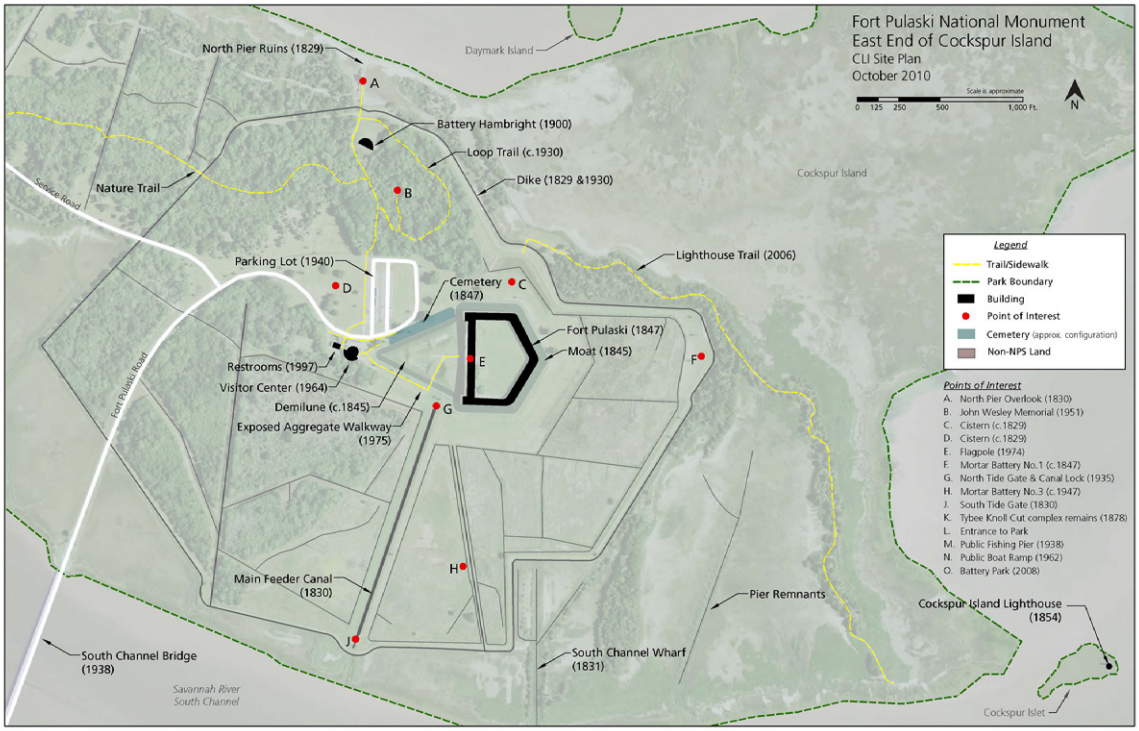


FIGURE 11. FORT PULASKI, EAST END (NPS 2012, 4)

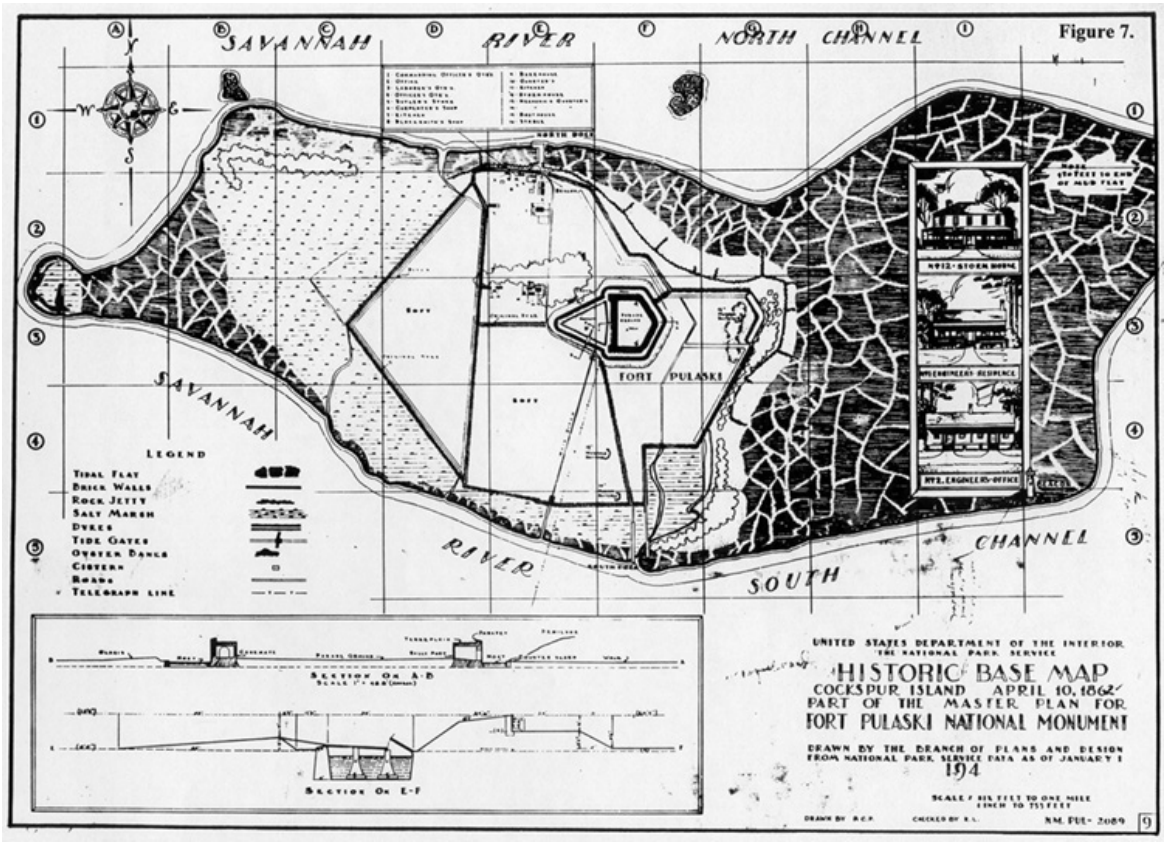


FIGURE 12. HISTORIC BASE MAP DEPICTING CONDITIONS, APRIL 1862 (NPS 2012, 74)

While the overall integrity of the Fort Pulaski National Monument landscape is high, climate change has been impacting the cultural landscape. The increased frequency of extreme weather events has resulted in damage to infrastructure, and sea level rise, rising groundwater tables, flooding, and saltwater intrusion into the site have impaired the historic drainage system and put the integrity of the cultural landscape at risk.

Trends, Ongoing Actions, and Planned Actions

The Georgia Department of Transportation is currently working on a replacement of the Bull River and Lazaretto Creek bridges on US Highway 80. One end of these bridges is within the NPS boundary. These bridge replacement efforts would temporarily adversely affect the cultural landscape for the duration of the replacement project due to construction being temporarily visible and audible within the viewshed and soundscape and construction temporarily causing worsened congestion within the viewshed and soundscape. Once completed, however, the new bridges will reduce congestion on US Highway 80 and accommodate nonmotorized travel and access to Fort Pulaski. Thus, overall, the bridge replacement would improve the cultural viewshed and soundscape.

Outside of this plan, other projects are underway that may impact the cultural landscape of Cockspur Island. The Corps of Engineers is rehabilitating the historic Fort Pulaski ditch and dike drainage system to create better flood resilience and protect the heavy masonry fort and cultural landscape. This project is part of a larger multiphase rehabilitation, which is being completed in sections, pending annual funding. Increased flooding events as a result of climate change have been occurring and are anticipated to continue. The rehabilitation project is anticipated to have a beneficial impact on the cultural landscape by creating resiliency to protect the fort and the landscape from flooding events, including flooding events attributed to climate change.

The Coast Guard recently completed an upgrade to the septic system on the west end of Cockspur Island (figure 9) for better operations. A wastewater treatment project for Fort Pulaski is currently on hold, as park staff will be able to use the new USCG septic system to make the administrative restrooms operational again. Park managers have communicated the need for and anticipate seeking funding for a parkwide comprehensive wastewater plan that includes new assets.

The Savannah River continues to be used as a transportation route, and modern ships pass within view of Fort Pulaski National Monument daily. These modern ships visually intrude into the cultural landscape's viewshed. External development to support modern shipping is anticipated to continue, likely resulting in more ships passing Cockspur Island and intruding into the viewshed of the cultural landscape and, therefore, adversely impacting the cultural landscape and viewshed.

Environmental Consequences of the Alternatives

Alternative A: No Action

Direct and Indirect Impacts

Under the no-action alternative, the current management of the cultural landscape would continue to be guided by the cultural landscape report (2011), the general management plan (2013), historic structure reports for the fort (2014) and the visitor center (2019), and the resource stewardship strategy (2024b). The cultural landscape report's overarching treatment recommendation with the historic landscape is preservation of all resources identified in the document. Restoration was applied to a select number of features, primarily for the open character of the landscape to more accurately reflect conditions at the time of the April 1862 battle and to provide the visitor with a greater understanding of the siege and reduction of the fort (NPS 2011). The general management plan largely formalized the 2011 cultural landscape report and described appropriate treatment for cultural landscapes in each management zone. Under the preferred alternative in the general management plan, the visitor parking area by the fort would be relocated outside of the viewshed from the top of the fort. The parking area would be returned to the approximate landscape condition that existed during the primary period of significance (April 1862). These actions to relocate the parking area and return the parking area to an approximately landscape condition is no longer viable due to the present impacts of climate change. There is no other guiding management direction for the parking lot and the parking lot area that considers these climate change impacts.

The fort's historic structure report recommended rehabilitation for the landscape features of the demilune, parade ground, and terreplein since preserving the landscape was not feasible. Rehabilitation furthermore supports the landscape's historic significance with the fort itself and the NPS mission to provide interpretation and visitor access (NPS 2014). The historic structure report for the Mission 66 visitor center recommended the treatment of rehabilitation for the surrounding landscape, given its association with the visitor center and the Mission 66 design and planning (NPS 2019). Under the no-action alternative, these treatments would guide the management of the landscapes associated with these historic structures. Cultural landscapes modified during the Mission 66 period, such as the entrance road to the parking area, would be maintained, supporting the treatment recommendation of the historic structure report.

Maintaining these Mission 66 landscapes, however, may come at the expense of the New Deal-era cultural landscapes, as indicated by the 1930s and 1940s park master planning. The New Deal era is a secondary period of significance for the site and contributes to the cultural landscape of the site. The general management plan discussed the beneficial and adverse impacts on the primary period of significance and the Mission 66-era landscape as a result of removing the parking area from the landscape (NPS 2013). As noted above, however, removing the parking area from the cultural landscape is no longer a viable action due to the present impacts of climate change on the site. Once the park completes an update to the national register nomination, additional guidance for the management of the site's cultural landscape would be needed. Under the no-action alternative, cultural landscapes that contribute to the integrity of the New Deal era of significance would be maintained, as there is no other guidance recommending their treatment. No new actions to address climate change, which is currently

adversely impacting the cultural landscape and limiting park management actions through damage to cultural and natural resources due to increased numbers of intense weather events, rising groundwater tables, and saltwater intrusion, would lead to long-term adverse impacts on the cultural landscape.

The western sidewalk and road crossing, installed in 2007 (NPS 2012) at the visitor center, would not be removed, and the park signs, also installed in 2007 (NPS 2012), would not be relocated to the eastern sidewalk and road crossing at the visitor center. The compatibility of this 2007 sidewalk and signs was not discussed in the 2012 cultural landscape inventory; however, 2006 National Historic Preservation Act (NHPA) compliance documentation for the installation of the western walkway and park signs documented "no adverse effect" to historic properties. The eastern sidewalk was resurfaced with oyster shell in 2007 and is a noncontributing but compatible feature with the cultural landscape (NPS 2012). Since the installation of the sidewalk and park signs resulted in no adverse effect on history properties, retaining the western sidewalk and park signs would similarly result in no adverse effect on historic properties and the cultural landscape. However, the historic structure report for the fort (NPS 2014) and the visitor center (NPS 2019) recommended rehabilitating the landscape to support interpretation and visitor access. Retaining the western sidewalk and signs may not be compatible with this recommended treatment. Furthermore, a raised crossing/speed table would not be installed at the eastern road crossing, having no adverse effect on the cultural landscape.

Under the no-action alternative, the visitor parking area would remain unimproved with no third parking tier. A new concrete sidewalk would not be installed along the eastern boundary of the expanded parking area to connect the noncontributing but compatible concrete sidewalk from the cemetery to the visitor center. Similarly, not formalizing a portion of the North Pier Trail (Nature Trail), a contributing feature to the cultural landscape, from the visitor center parking lot would have a continued adverse effect on the cultural landscape since the trail was removed in the 1990s and the area scarified and reseeded with grass (NPS 2012).

On the western end of Cockspur Island, no improvements to the Mission 66 picnic area would occur, resulting in no adverse effects on historic properties. Gravel parking, new ABA-compliant parking, picnic tables, and restrooms, and ABA-compliant sidewalks would not be installed. The 1985 prefabricated restroom facility would remain, with no adverse effect on the cultural landscape. Once documentation for a determination of eligibility is complete for the picnic area, this assessment may need to be revisited; however, no adverse effects are anticipated under the no-action alternative at this time.

Cumulative Impacts

Although there would be no change to the cultural landscape as part of this plan, other projects are being undertaken, regardless of the no action or preferred actions in this plan, that may impact the cultural landscape. The USACE project to rehabilitate the ditch and dike system, the first phase of which is complete, has had a short-term adverse impact on the cultural landscape due to workers, heavy equipment, and construction material being in the landscape during rehabilitation work. To access the project area, transport equipment, and create a stable surface for the work, contractors undertaking the work established an access path through the marsh.

As this project concludes, however, and construction material and heavy equipment are removed from the cultural landscape, the project will have a long-term beneficial impact on the cultural landscape by improving the site's resiliency to flooding and protecting the fort. Given the additional work that needs to be done, park managers are unsure of the long-term plan for the access path through the marsh. Additional ditch and dike rehabilitation projects will compete for funding and, if funded, will have similar temporary, time-limited adverse impacts on the cultural landscape while rehabilitation activities are underway. Once completed, the projects are anticipated to have a long-term beneficial impact on the cultural landscape because of improved resiliency to flooding and sea level rise. Finally, regardless of the no action or preferred actions in this plan, the continuation of shipping along the Savannah River will continue to have temporary, though long-term, adverse impacts on the cultural landscape and viewshed, as ships will be seen and heard from Cockspur Island. The shipping vessels will continue to contribute to the long-term adverse impacts on the cultural landscape due to shoreline erosion caused by shipping wake.

Without additional actions to address climate change, climate change will continue to have adverse impacts on the cultural landscape, as extreme weather events are becoming more frequent and causing infrastructure damage. Sea level rise, rising groundwater tables, and saltwater intrusion into the site are impairing the historic drainage system, and although there are projects outside of this plan to improve the historic drainage system, park managers would be unable to identify and take action to address new climate change impacts on the cultural landscape under the no-action alternative.

The trend of increasing visitation would result in cumulative adverse impacts on the cultural landscape. Since no improvements would be made to accommodate this increase, the park may experience visitors parking vehicles in undesignated areas, which may cause erosion or rutting visible in the cultural landscape. The severity and duration of erosion or rutting would depend on the location of the unauthorized parking and groundwater level.

Conclusions

Under the no-action alternative, continuing current management would primarily result in beneficial impacts on the cultural landscape. Cultural landscapes from the primary period of significance (1829–1900) and the secondary period of significance (1933–1942, New Deal era) would be managed following treatment recommendations in park management documents. Cultural landscapes from the Mission 66 era would be documented in a national register update and retained in their current configuration. Under the no-action alternative, however, climate change damage, caused by increased intense weather events, rising groundwater tables, and saltwater intrusion to the natural and cultural resources contributing to the cultural landscape would continue. Without management action, an especially intense climate event, as well as climate change cumulative damage, would have long-term adverse impacts on the cultural landscape.

Alternative B: Proposed Action and Preferred Alternative

Direct and Indirect Impacts

The preferred actions to relocate the entrance booth closer to the visitor center and widen the park entrance road to install a queuing lane and an emergency/USCG bypass lane would have an adverse effect on New Deal-era circulation features. These circulation features remain in place and comprise a significant example of New Deal development.

Modifying the visitor center parking lot by paving the third tier of parking and designating a large vehicle turnaround would be a departure from the management action described in the general management plan's preferred alternative. The general management plan's preferred alternative stated, also mentioned above, that the visitor parking area by the fort would be relocated outside of the viewshed from the top of the fort and the parking area returned to the approximate landscape condition that existed during the principal period of significance (April 1862). This action from the general management plan is, however, no longer viable due to the present impacts of climate change on the site. Paving the third tier of parking and designating a large vehicle turnaround would have an adverse effect on the primary cultural landscape (period of significance: 1829–1900). In contrast, the action would be a beneficial effect on the secondary cultural landscape (period of significance: 1933–1942) and the potentially eligible Mission 66-era cultural landscape since the parking lot configuration was delineated as part of the park's New Deal-era improvements and largely retained during the Mission 66 era. The 2012 cultural landscape inventory suggested that both the entrance road and the parking area be added to an updated national register nomination. An ongoing effort is underway to update the national register nomination to include Mission 66 resources. If this parking lot action is funded, future compliance efforts would need to consider the updated national register nomination.

An increase in the number of vehicles, including large vehicles, in the expanded parking area may adversely affect the viewshed and soundscape of Fort Pulaski's cultural landscape. The historic viewshed and cultural landscape of Fort Pulaski, as it appeared during the primary period of significance (1829–1900), would not be adversely impacted because the viewshed and cultural landscape have degraded integrity of setting due to the parking lot's installation and other additions to the area from the New Deal and Mission 66 eras. The viewshed and soundscape of this area since the New Deal and Mission 66-era improvements, however, have primarily remained the same since the periods of improvements, and an increase in vehicles, including large vehicles, may adversely impact these later periods of significance.

Removing the western sidewalk and road crossing and relocating the signs to the eastern sidewalk and crossing at the visitor center parking would have a beneficial effect on the cultural landscape since the western sidewalk, road crossing, and signs were installed in 2007. Furthermore, the historic structure report for the fort (NPS 2014) and the visitor center (NPS 2019) recommended rehabilitating the landscape to support interpretation and visitor access. These changes, as well as installing a raised crossing/speed table at the eastern road crossing, a noncontributing but compatible feature to the cultural landscape, would have no adverse effect on the cultural landscape. Overall, these actions would have a beneficial impact on the cultural landscape by removing nonhistoric features and improving visitor circulation in the cultural landscape.

As the new facility for park maintenance is constructed and becomes operational, operations will begin to move to this new structure, and the current maintenance building and associated structures would be "phased out" of use. At present, there are no more details available regarding the time line for the new building construction and movement of operations. While demolition of the current maintenance building and associated structures are not part of this development concept plan, their eventual demolition, once they are no longer viable, may have an adverse effect on the New Deal-era cultural landscape. The 2011 cultural landscape report recommended the preservation of the CCC-era maintenance buildings (NPS 2011), and the 2012 cultural landscape inventory noted that further documentation was needed to determine the eligibility of the resources in the maintenance area (NPS 2012). The need for further documentation is particularly true of the Mission 66-era resources and modifications following the 2015 multiple property nomination.

The construction of a new building on the west end of Cockspur Island near the USCG station to house park maintenance, cultural and natural resources, and law enforcement staff and equipment is not anticipated to have an adverse impact on the cultural landscape of this area since the wider cultural landscape has historically been modified with the construction and demolition of the quarantine station complex, CCC camp, US Navy complex, and the historic Savannah Bar Pilots buildings. Additionally, the Savannah Bar Pilots and Coast Guard constructed new complexes in 1973 and 1983, respectively, in this area. The specific location for new structure was modified in 2006 with the addition of four VIP pads, a septic system, and utility lines (PMIS 91824). Finally, the Coast Guard recently completed the construction of a new operations facility (2024) in the area immediately north of the proposed new building site.

While modification has regularly occurred on the western end of Cockspur Island, this area of the island had largely been maintained as a post-1952 cultural landscape, following the demolition of the historic structures and complexes mentioned earlier. Furthermore, since 50 years have passed since the construction of the 1973 Savannah Bar Pilots structures, they and their related cultural landscape are potentially eligible for the national register. Additional compliance may be necessary to document potential site-specific impacts of this new park building on the post-1952 cultural landscape once design details are developed. However, the addition of the building in this area is anticipated to have no adverse effect on the landscape, which has historically been modified and is undergoing modification with the construction of the Coast Guard facility. The design of the replacement NPS building would be compatible with the history of modifications of the west end of Cockspur Island for NPS administrative and maintenance use, Coast Guard administrative use and operations, and use by the Savannah Bar Pilots. The new park building would not affect the integrity of any listed or eligible properties, as the post-1952 landscape would be maintained around the Savannah Bar Pilots property and park headquarters.

The relocation of VIP campsites from their present location (established in 2006) to the southeast is also not anticipated to adversely impact the wider cultural landscape of the western portion of Cockspur Island since the cultural landscape has been historically altered, as mentioned above. Although the design details of the relocation have yet to be developed, the relocation may, in fact, be a beneficial impact on the cultural landscape since the relocation

would remove RVs from cultural landscape to an area screened by vegetation. Once design details are known, additional compliance will be needed.

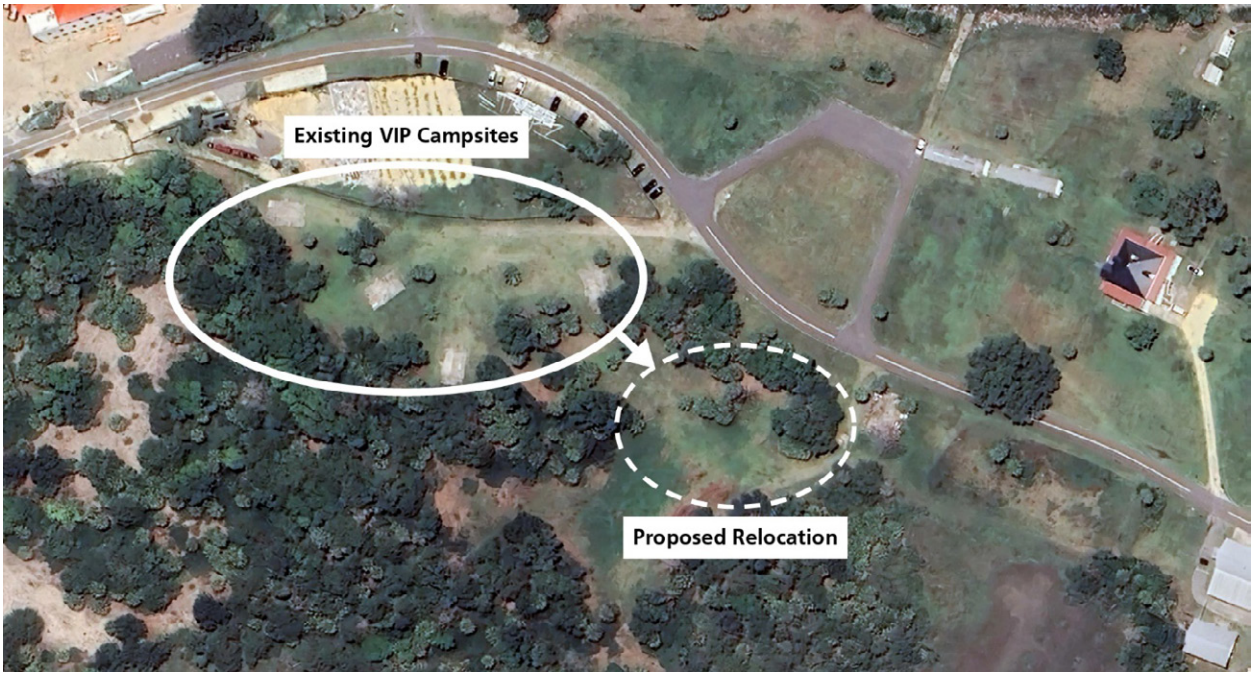


FIGURE 13. CURRENT VIEW OF EXISTING VIP CAMPSITES AND THE PROPOSED RELOCATION AREA

Finally, improvements to the picnic area with the addition of a formalized parking area; ABA-compliant parking spaces, picnic tables, restrooms; and pathways would have a temporary adverse impact on the cultural landscape as the improvements occurred. However, once the improvements were complete, they would have a long-term beneficial impact on the cultural landscape, as follows. Improving the surface treatment of the parking lot, currently consisting of turf and an eroded turf sand surface, with approximately 12,000 square feet of gravel, would improve the cultural landscape by clearly delineating the parking area and preventing further turf and sand erosion from vehicles parking outside the parking areas. The parking area footprint would not increase. Installing ABA-compliant parking spaces would not adversely impact the cultural landscape, as these parking areas would be installed in the footprint of the turf/sand parking area. The installation of two ABA-compliant picnic tables and concrete pads would also not adversely impact the cultural landscape because they would be located in the currently delineated parking area, and there are other picnic tables and picnic tables with concrete pads currently present in the small, planted slash pine grove. Therefore, these new tables are compatible with the historic and current use of the cultural landscape. The installation of an ABA-compliant restroom would have a beneficial impact on the cultural landscape since it would allow for the removal of noncompatible portable toilets in the parking area. The ABA-compliant restroom would be compatibly designed to the cultural landscape. Finally, the installation of ABA-compliant pathways to the picnic tables, covered picnic area, and ABA-compliant restrooms would also not be an adverse impact on the cultural landscape since these pathways would be located in the current parking area and would support the function of the picnic area. The total estimated square footage of concrete path connecting the accessible parking, picnic tables, and restroom and to the existing covered picnic structure is

approximately 1,600 square feet. As design details are developed, this estimate may change. The demolition of the 1985 prefabricated restrooms would improve the cultural landscape of the area by removing the restrooms from the view in the planted slash pine grove.

Cumulative Impacts

Regarding the USACE project to rehabilitate the ditch and dike system, the continuation of shipping along the Savannah River, and climate change threats to the cultural landscape, the cumulative impacts are the same as no-action alternative. The trend of increasing visitation would result in a mixture of cumulative adverse impacts and beneficial impacts on the cultural landscape. Adverse impacts may be associated with an increase of vehicles queuing at the new entrance station and an increase in vehicles, including large vehicles, in the landscape at the expanded visitor parking lot and picnic area. Expanding and formalizing the parking area at the visitor center and the picnic area may be a beneficial impact on the cultural landscape, as well, since vehicles would not park in unauthorized areas, decreasing erosion and rutting. Finally, if funded in the future, demolition plans for historic structures in the maintenance area would have a long-term adverse impact on the cultural landscape due to the loss of the structures. As discussed in the historic structures section below, however, the maintenance area has been the site of modifications and additions, and the cultural landscape inventory recommended further documentation to determine the eligibility of the resources for the national register (NPS 2012). The completion of this documentation would be a cumulative beneficial impact on the cultural landscape and help guide management decisions on the maintenance area.

Comparative Conclusion across Alternatives

Under alternative A, current management would continue, and, therefore, there would be no new direct, indirect, or cumulative impacts on the cultural landscape. Alternative B would have direct adverse and beneficial effects on the cultural landscape. The changes to the entrance booth and park entrance road, the increase of vehicles in the cultural landscape, and the construction of a new maintenance facility and eventual demolition of the maintenance facility structures would result in long-term adverse impacts on the cultural landscape. The expanded paved surface of the New Deal-era parking area would also have a long-term adverse impact on the primary cultural landscape (1829–1900) but a beneficial impact on the secondary cultural landscape (1933–1942) by completing the historic design for the New Deal-era parking area and possibly on the Mission 66-era landscape, which largely retained the New Deal-era modifications. The modifications to the pedestrian crossing near the visitor center would also have a long-term beneficial impact on the cultural landscape by removing modern and redundant landscape features and improving visitor circulation and safety in the cultural landscape.

HISTORIC STRUCTURES

Affected Environment

Historic structures served and may continue to serve some form of human activity and are generally immovable. They include buildings and monuments, canals, bridges, roads, defensive works, and ruins of all structural types. Fort Pulaski comprises 23 historic structures, which

include the fort, the fort moat, dikes, cisterns, various ruins, Battery Horace Hambright, and the Cockspur Island Lighthouse (NPS 2013). Information about historic structures not described in this plan and additional contextual background are available the park's general management plan (2013), cultural landscape report (2011), cultural landscape inventory (2012), administrative history (2003), resource assessment (2007), and historic structure reports for Fort Pulaski (2014) and the visitor center (2019).

The Fort Pulaski dike and ditch system was designed by Robert E. Lee and excavated and constructed by enslaved African Americans and free White workers. The system was completed in the early 1830s under Joseph K. F. Mansfield. The dike and ditch system extends from the fort in all directions over an area of roughly 200 acres. The dike and ditch system are only briefly mentioned in the overall Fort Pulaski structure entry in the 1974 national register nomination, but the 2012 cultural landscape inventory notes their significance related to criterion B, in association with Robert E. Lee, and criterion C, as part of the engineering and architecture of Fort Pulaski. Furthermore, the repair and reconstruction of the dike and ditch system was one of the primary accomplishments of the Civilian Conservation Corp in the 1930s. The design of the dike and ditch system retains a high level of integrity. The repair and reconstruction of the eroded historic dike system in 1997 restored its historic elevation. The restored elevation is a character-defining feature, and the original dike system contributes to the cultural landscape of the Cockspur Island Historic District (NPS 2011, 2012a, 2013, 2020; Trout 1974).

Although the Workers' Village was destroyed in 1881 by a hurricane, scattered remnants of brick and stone foundations remain. Seven circular brick cisterns are the only above-ground resources remaining from the village, and the bakehouse cistern is covered in dredge spoil. An eighth cistern is buried beneath the northern outer dike that was reconstructed by the Civilian Conservation Corp in the 1930s. The cisterns have been filled in due to safety issues. The 2012 cultural landscape inventory notes that the loss of the village compromised the integrity of the setting, feeling, and association with the cultural landscape; however, the integrity of the cisterns varies from good to severely compromised (NPS 2012).

With the addition of the 1933–1942 period of significance from the 2012 cultural landscape inventory, the park entrance road and parking lot could be added to an updated national register nomination, which is in progress. The road to the quarantine station and the park entrance road and parking area were completed in 1938. Cutback asphalt, sand, cinders, and ground oyster shells were used to surface the new road, which was 20 feet wide and 4–5 inches thick, with an elevation of 12 inches. The main parking area was completed in 1940 and paved by 1942. By 1946, park maps show the road extended to the western park boundary. The park entrance road was realigned in the 1960s as part of the Mission 66 program to support visitor circulation with the new visitor center (opened in 1964). While the alignment of the entrance road was altered when the visitor center was constructed, the spatial footprint was not compromised. The entrance road and parking area retain a high level of design integrity and contribute to the cultural landscape (NPS 2012). Pedestrian walkways and trails from the parking area to the visitor center and Fort Pulaski, including those that are historic, as discussed above in the cultural landscapes section, are noncontributing but compatible with the landscape. The North Pier Trail (Nature Trail) is a contributing feature of the cultural landscape (NPS 2012), as noted above.

While planned for during the Mission 66 period, the fee collection station located at the park entrance was acquired in the 1980s and expanded in 2001. The entrance station is not considered a contributing resource (NPS 2012).

The park's picnic area was a Mission 66 project (1965) and included 20 picnic tables placed in a planted slash pine grove southwest of the service road on the west end of the island. A prefabricated restroom facility was added in 1985. In 1988, the park modified the picnic area for handicap accessibility by constructing two elongated tables with oversized concrete slabs and adding an accessible drinking fountain, designated parking area, and unobstructed pathways to the restroom. A picnic shelter was added in 2004 and is compatible with the cultural landscape (NPS 2012). The picnic shelter was enclosed in white siding in 2021. Since the 1980s, park staff have regularly replaced and upgraded benches and picnic tables in the picnic area. The picnic area has no historic structures.

Within the park's maintenance area, a metal building (truck shed, repair, tool storage) was constructed in 1935, and the oil house and gas pump from the South Channel boat landing were moved here at this time. By 1940, a one-story frame building was added to this area. In 1960, a cinder block gas and oil storage house were constructed, replacing the 1935 oil house and gas pump. The utility building was rehabilitated and expanded in 1973. Other additions and repairs to buildings in the maintenance area have occurred since 1993. The garage and the oil houses are listed as noncontributing but compatible with the cultural landscape of this area. The cultural landscape inventory recommended further documentation to determine the eligibility of resources in the maintenance area for the national register (NPS 2012). The update to the monument's national register nomination (in progress) will document the remaining historic fabric and integrity of these structures. Park staff understand the historic fabric and integrity to be limited due to the subsequent renovations and structural damage caused by hurricanes.

In 2006, four VIP pads were added west of park headquarters across the service road from their present location. Since these pads were installed in 2006, they are not considered historic (NPS 2012).

Trends, Ongoing Actions, and Planned Actions

The historic structures on Cockspur Island continue to be preserved and maintained, and management strategies to support long-term preservation and understanding of the historic structures are part of the park's resource stewardship strategy. Climate change, changing hydrology, and more severe storm events will continue to threaten the long-term preservation of the historic structures on Cockspur Island. The USACE rehabilitation of the historic ditch and dike system will provide a beneficial impact on the historic system itself and create better flood resilience for the fort, associated historic structures, and cultural landscape.

Environmental Consequences of the Alternatives

Alternative A: No Action

Direct and Indirect Impacts

Under the no-action alternative, current management of the historic structures would continue to be guided by the cultural landscape report (2011), general management plan (2013), historic

structure reports for the fort (2014) and the visitor center (2019), and the resource stewardship strategy (2024b). The cultural landscape report's overarching treatment recommendation was the preservation of all identified resources. The treatment of restoration was applied to a select number of features, primarily to more accurately reflect the landscape conditions at the time of the April 1862 battle and to provide the visitor with a greater understanding of the siege and reduction of the fort (NPS 2011). Under the preferred alternative in the general management plan, the New Deal-era visitor parking area by the fort would be removed to support the restoration the cultural landscape to the time of the battle (1862) (NPS 2013). This action is, however, no longer viable due to the present impacts of climate change on the site, and there is no other guiding management direction for the parking lot that considers these climate change impacts. No other actions in the general management plan addressed historic structures.

The fort's historic structure report recommended the overarching treatment of the structure itself as preservation to support the continued protection of historic character-defining features, as well as allowing nonintrusive features related to visitor support and park operations to remain. Rehabilitation was the recommended treatment approach for the landscape features of the demilune, parade ground, and terreplein since preservation of the landscape was not feasible (NPS 2014). The historic structure report for the visitor center recommended the overarching treatment of rehabilitation to support the continued protection of character-defining features while incorporating modifications as needed to support continued use. The recommended treatment for the surrounding landscape was also identified as rehabilitation (NPS 2019).

Cumulative Impacts

Although there would be no change to the historic structures as part of the no-action alternative, other projects are being undertaken that have impacted historic structures. The Corps of Engineers' project to rehabilitate the ditch and dike system has had a short-term adverse impact on the system, as the heavy equipment used partially damaged the top of a historic dike. The dike, however, has been repaired. The first phase of this project, recently completed in 2024, will have a long-term beneficial impact on the historic structure itself by clearing out the accumulated soil and vegetation that have been limiting the effectiveness of the system. The project will also have a beneficial impact on other historic structures in the park by improving the site's resiliency to flooding. Pending funding, future ditch and dike rehabilitation projects would also have temporary adverse impacts on historic structures during the rehabilitation activities. The projects are anticipated to have long-term beneficial impacts on historic structures after completion by improving the site's resiliency to flooding. Climate change will continue to have adverse impacts on the historic structures through sea level rise, rising groundwater levels, and saltwater intrusion, which could overwhelm the historic ditch and dike system.

Conclusions

Under the no-action alternative, there would be no new adverse impacts on historic structures since the general management plan's recommendation to remove the historic visitor parking area by the fort is no longer a viable management option due to climate change. Concurrent projects, such as the USACE ditch and dike system rehabilitation, would have a long-term

beneficial impact on the historic system and other historic structures. Climate change impacts will continue to have adverse impacts on the historic structures.

Alternative B: Proposed Action and Preferred Alternative

Direct and Indirect Impacts

Under the preferred alternative, adverse impacts on historic structures would occur due to widening the park's entrance road, installed during the New Deal era. The current width of the entrance road is that of its historic width (20 feet), and widening the road would adversely affect the historic road prism and alignment. The paving of a historically delineated third tier parking area would complete the original, planned design of the New Deal-era parking area and be a beneficial impact on the historic structure. Formalizing this third tier parking would be a departure from the preferred alternative in the general management plan, which called for the removal of the visitor parking area by the fort. As noted above, however, implementing the general management plan's action for the parking is no longer viable due to current climate change impacts on the site. The "phasing out" of all maintenance-area building use as the new facility becomes operational and their eventual demolition once operations have moved into the new facility would have an adverse effect on the historic structures since the 2011 cultural landscape report recommended the treatment to preserve the CCC-era maintenance buildings. Additional research and documentation on these historic structures and their eligibility for the national register or their eligibility in contributing to a national register district, such as the updated nomination currently underway, is needed before any final future decision about the demolition of these structures.

Reestablishing the New Deal-era circulation of the entrance road to the parking area would have a beneficial effect on this segment of the historic road prism, which was abandoned in place. Additional improvements to this historic segment may be needed to support modern traffic load. More information is needed to determine the condition of this road segment and its ability to support current and future anticipated park traffic.

Cumulative Impacts

Similar to the no-action alternative, other projects are being undertaken that have impacted historic structures. The Corps of Engineers' project to rehabilitate the ditch and dike system has had a short-term adverse impact on the system, as the heavy equipment used partially damaged the top of a historic dike. The dike, however, has been repaired. The project will have a long-term beneficial impact on the historic structure itself by clearing out the accumulated soil and vegetation that have been limiting the effectiveness of the system. The project will also have a beneficial impact on other historic structures in the park by improving the site's resiliency to flooding. Pending funding, future ditch and dike rehabilitation projects would also have temporary adverse impacts on historic structures during the rehabilitation activities. The projects are anticipated to have long-term beneficial impacts on historic structures after completion by improving the site's resiliency to flooding. Climate change will continue to have adverse impacts on the historic structures through sea level rise, rising groundwater levels, and saltwater intrusion, which could overwhelm the historic ditch and dike system.

Cumulative impacts under the preferred alternative include potential future demolition plans for all of the historic structures in the maintenance area once the new facility is operational. This potential future demolition would have an adverse impact on these historic structures. Severe storm events and climate change, however, have the potential to damage the structures beyond feasible repair or demolish these structures entirely, so additional research and documentation for national register eligibility is needed.

Comparative Conclusion across Alternatives

Under alternative A, current management would continue, and, therefore, there would be no new direct, indirect, or cumulative impacts on historic structures. Alternative B would have direct adverse effects on the entrance road by modifying the New Deal-era road prism and configuration. Alternative B would have a direct beneficial impact on the parking area by finishing the New Deal-era design and delineating the historic parking area. The "phasing out" of maintenance area buildings would have an adverse effect on the historic structures since the park would cease operations here as the new building becomes operational and would eventually demolish these buildings. The 2011 cultural landscape report recommended the treatment to preserve the CCC-era maintenance buildings.

ARCHEOLOGICAL RESOURCES

Affected Environment

Archeological resources are the remains of past human activity and records documenting the scientific analysis of these remains (NPS Director's Order 28: *Cultural Resource Management*). The 2012 cultural landscape inventory noted that Cockspur Island holds archeological potential (criterion D) for the Civil War and related features and earlier forts, the Workers' Village, and the South Pier. Woodland Period and Mississippian Period sites are likely to be in the park, but no archeological testing has yet been performed (NPS 2012).

The Southeast Archeological Center (SEAC) conducted noninvasive remote sensing using an EM-38 Electro Conductivity meter for the graves of the Confederate prisoners of war interred at Fort Pulaski in 1994. The survey took place north of the demilune and moat near the visitor parking area and in a portion of the parking area that is part of this development concept plan. No anomalies were identified in the portion of the parking area that was surveyed. In 1999, subsequent investigations completely delineated the cemetery's boundaries (NPS 2010, 2012; Seifert, Matera, and Long 2023). No additional archeological surveys have occurred in this plan's area of effect for the visitor parking area, and additional research is needed for the portions of the parking area, walkways, and trails that were not previously surveyed.

Archeological investigation has also occurred in some areas covered in this plan on the western portion of Cockspur Island. In 2022, the Southeast Archeological Center conducted an NHPA section 110 archeological survey of the western portion of Cockspur Island to identify the remains of historic structures associated with the quarantine station, the CCC camp, the WWII naval base, and any other unknown archeological resources. The results of the survey revealed archeological features and artifacts in areas not included in this development concept plan. Only one site, the South Shore Artifact Scatter (FOPU-15), was identified south of the proposed area

for the relocated VIP campsite location. Shovel Test 2 marked the northern edge of this site. The report recommended that it is eligible for listing on an updated national register nomination for Fort Pulaski National Monument. Shovel Test 3, 4, and 14 were also placed in the general areas of the proposed relocated VIP campsite. These tests encountered dredged soil of varying depths and consistency and resulted in small amounts of undiagnostic historic to modern material. These tests were determined to not be associated with intact archeological resources (NPS 2022a). A dike appears in Mission 66 documentation in this area as well (NPS 1960), although the 2022 archeological report did not investigate this area (NPS 2022a). A 2021 Terracon Consultants Inc. survey of the Mission 66 picnic area did not discover presence of a suspected historic ditch buried in the area. Additional research is needed to determine the presence and integrity of this feature.

The 2022 report also summarized a 2015 SEAC excavation (SEAC Acc. 2730) which was undertaken as part of proposed improvements to facilities at the Coast Guard station (NPS 2022a). The investigation included 19 tests in an open lawn southeast of the station, currently used as a campsite for recreational vehicles used by Volunteers-in-Parks (NPS 2022a), which is the proposed location of the new maintenance facility described in this plan. The testing in the VIP campsites and RV parking area identified brick, glass, terracotta fragments, historic ceramics, gun flints, asbestos tile, and modern plastic and glass. The intermingled context of the material and waterworn condition of historic ceramics was interpreted as coming from dredged soil, modern deposition, and storm debris rather than intact archeological deposits. Shovel testing as part of the 2022 survey, Shovel Test 30 and 31 identified coal slag, unidentified iron, rock fragments, unidentified metal fragments, and asbestos tile fragments, which were discarded in the field. These tests were determined to not be associated with intact archeological resources (NPS 2022a). The dike that appears in Mission 66 documentation, as mentioned above, may pass through this area as well (NPS 2010, 1960), and no archeological reports appear to have investigated this ditch. Additional research is needed to determine the presence and integrity of this feature.

In 2021, Terracon Consultants, Inc. conducted a ground-penetrating radar and magnetometry survey of the Mission 66 picnic area. According to preliminary findings, there was no sign of subterranean soil disturbances that indicated the presence of a suspected historic ditch buried in the area, as noted above. Buried storage tanks and utility lines were detected, as well as possible debris that could be buried building material and a possible buried foundation. No cultural materials were encountered as a result of the surveys, and no ground disturbance activities took place. Since possible buried building material and the possible foundation are in the area of effect for this development concept plan, additional research is needed to confirm the presence of building materials and building foundation. As design plans are developed for this area, archeological features will be avoided to the extent possible.

Some archeological surveys have been conducted for the maintenance area. This area was designed and established during the New Deal era and was subsequently modified through the 1990s. Additional research is needed to determine the presence of archeological deposits before the New Deal-era construction, during the New Deal era, and through the subsequent phases of historic modifications.

Some limited and project-based archeological surveys have been conducted for the area of the expanded park entrance road and relocated entrance booth. The entrance road was constructed during the New Deal era, and additional research is needed to determine the presence of archeological deposits before the New Deal-era construction and during the New Deal era.

Trends, Ongoing Actions, and Planned Actions

As documented during the 2023 archeological investigation of the Workers' Village, the impacts of climate change are worsening, and archeological sites are impacted by rising sea levels and saltwater inundation. Artifacts will need to undergo conservation or different cleaning techniques due to their exposure to salts and salt water, and iron artifacts exposed to salt and salt water have severely corroded, most beyond identification. Higher groundwater levels have led to the flooding of archeological units, the erosion of the units and features within them, and the subsequent stoppage of excavation (Seifert, Matera, and Long 2023). The effects of climate change may result in tree falls, which can damage archeological resources and become more common as tree health declines due to increasing salination, oversaturated and unstable soils, and more frequent severe storm and wind events.

ARCHEOLOGICAL RESOURCES

Environmental Consequences of the Alternatives

Alternative A: No Action

Direct and Indirect Impacts

Under the no-action alternative, the current management of archeological resources would continue to be guided by the general management plan (2013), recommendations in recent archeological surveys, and the resource stewardship strategy (2024b). No ground disturbance would occur related to an expanded entrance road, relocated entrance booth, paved parking area and pedestrian improvements, new maintenance facilities, relocated VIP camping area, picnic area improvements, or ground disturbance related to the installation of utility and sewer lines to support these projects.

Cumulative Impacts

Ground disturbance associated with the USACE ditch and dike rehabilitation may have a long-term adverse impact on archeological resources with the construction of an access path through the marsh and heavy equipment potentially causing soil compaction or gouging and rutting or other ground disturbance during the course of the project. Climate change impacts will continue to have adverse impacts on in-situ archeological resources due to rising sea levels, groundwater levels, and saltwater intrusion, making in-situ archeological resources more vulnerable to damage, decay, or degradation.

Conclusions

Under the no-action alternative, there would be no change in beneficial or adverse impacts on archeological resources. Ongoing projects, such as the USACE ditch and dike system rehabilitation, may have an adverse effect on archeological resources associated with the ditch

and dike system or subsequent historic improvements. Climate change impacts will continue to have adverse impacts on in-situ archeological resources.

Alternative B: Proposed Action and Preferred Alternative

Direct and Indirect Impacts

Under the preferred alternative ground disturbance associated with the installation of the new entrance station and associated utility lines, the widening of the historic New Deal-era entrance road and road prism, and the paving of the third tier of the parking area and pedestrian improvements are not anticipated to adversely affect archeological resources since these areas were disturbed as part of the road and parking lot construction. Some previous, limited archeological survey has been conducted along the New Deal era entrance road and in parts of the visitor parking area. The areas which have not been surveyed, need to be surveyed prior to the beginning of these projects.

Ground disturbance at the Mission 66 picnic area may include scraping and leveling for the installation of the gravel parking lot, new ABA-compliant pathways, picnic tables, and parking spaces. These ground disturbance actions may adversely impact archeological resources. Adverse effects on archeological resources in the picnic area may also be associated with ground disturbance for the installation of new ABA-compliant restrooms and their sewer and utility lines. Since remote sensing in the picnic area detected archeological resources in the area of effect, additional research is needed to confirm the results of the remote sensing. As appropriate, archeological surveys would precede any ground disturbing activity. Known archeological resources would be avoided to the greatest extent possible. If National Register eligible or listed archeological resources could not be avoided, an appropriate mitigation strategy would be developed in consultation with the State Historic Preservation Officer and, as necessary, American Indian tribes traditionally associated with park lands.

No effects on archeological resources are anticipated in the construction of a new maintenance facility since a previous archeological investigation in 2015 determined that the archeological material recovered there came from dredged soil, modern deposition, and storm debris rather than from intact archeological deposits and context. As details of this project are developed, consideration will need to be given to the location of archeological resources and utility and power lines to support this new facility and additional compliance may be necessary. Archeological resources would be avoided to the greatest extent possible

No effects on archeological resources are anticipated with the relocation of the VIP campsites and the installation of sewer and utility lines to support these campsites due to the 2022 archeological shovel testing that indicated dredged soil and mixed archeological context in this area. Because the depth of the dredged soil varies and there is the potential for intact site deposits beneath zones of modern disturbance, additional archeological surveys may be needed as the depth and alignment of the sewer and utility lines are determined through design. Additional compliance may also be necessary as this project develops. Archeological resources would be avoided to the greatest extent possible.

Cumulative Impacts

Same as a no-action alternative regarding the USACE ditch and dike rehabilitation and climate change impacts. Without archeological survey preceding the preferred actions for the entrance road and entrance station, visitor parking area improvements, and picnic area improvements in order to avoid impacts on archeological resources, long-term potential adverse impacts may occur as a result of these projects.

Comparative Conclusion across Alternatives

Under alternative A, current management would continue, and, therefore, there would be no additional direct, indirect, or cumulative impacts on archeological resources. Ground disturbance activity for the new entrance station and utility lines, the New Deal-era entrance road and road prism, installing the third tier to the parking area, improving pedestrian crossing, and improving the Mission 66 picnic area under alternative B are not anticipated to have adverse effects on archeological resources since these areas have been previously disturbed. While there is some limited archeological survey associated with these areas, archeological survey is necessary before these actions to ensure that they do not adversely impact archeological resources. No adverse effects are currently anticipated for the construction of a new maintenance facility nor the relocation of the VIP campsites and sewer and utility lines to support these campsites since the soil is dredged fill and the archeological context is disturbed.

FLOODPLAINS

Affected Environment

Fort Pulaski and all of the structures in the system of dikes and drainage ditches that were constructed between 1830 and 1847 exist mainly in an area that was formerly salt marsh or wetlands. Before being drained and reclaimed with spoil, these areas were subject to regular inundation from tidal action and storm events. Other parts of Cockspur Island have likewise been reclaimed with dredge spoil over the years (NPS 2013). These reclaimed areas host structures that serve the National Park Service, the Coast Guard, and the Savannah Bar Pilots Association. When flooding occurs on the island, it is typically driven by rising waters in the adjacent Savannah River and in on-site drainage features. Long periods of heavy precipitation, as well as storm surge from the Atlantic Ocean associated with hurricanes and tropical storms, can cause rising water to overtop the banks of the Savannah River and enter drainage features on the site. During periods of heavy precipitation, some ponding also occurs in low-lying areas and swales around the site due to the flat terrain and drainage constraints of the site.

Under the no-action alternative, the current management of floodplains would continue to follow guidance in the general management plan (2013) and the park's resource stewardship strategy (2024b). Executive Order 11988, "Floodplain Management," and Executive Order 13690, "Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input," require the National Park Service and other federal agencies to identify the likely impacts of preferred actions in floodplains and to improve the nation's resilience to flood risk. The objective of Executive Order 11988 is to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and

modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Executive Order 13690 was issued to establish a Federal Flood Risk Management Standard for federally funded projects to improve the nation's resilience to floods and to ensure that new federal infrastructure will last as long as intended. Park Service procedures for complying with the floodplain executive orders are outlined in NPS Director's Order 77-2: *Floodplain Management* and *Procedural Manual #77-2: Floodplain Management*.

Although the entire preferred action would be located in the 100-year floodplain (and includes all of Cockspur Island), the project area is on the highest and most flood-resilient NPS land on the island (approximately 11 feet above sea level). Note that according to the Federal Flood Risk Management Standard (NOAA 2024), this elevation is approximately 14–15 feet across the project area (see figure 14).

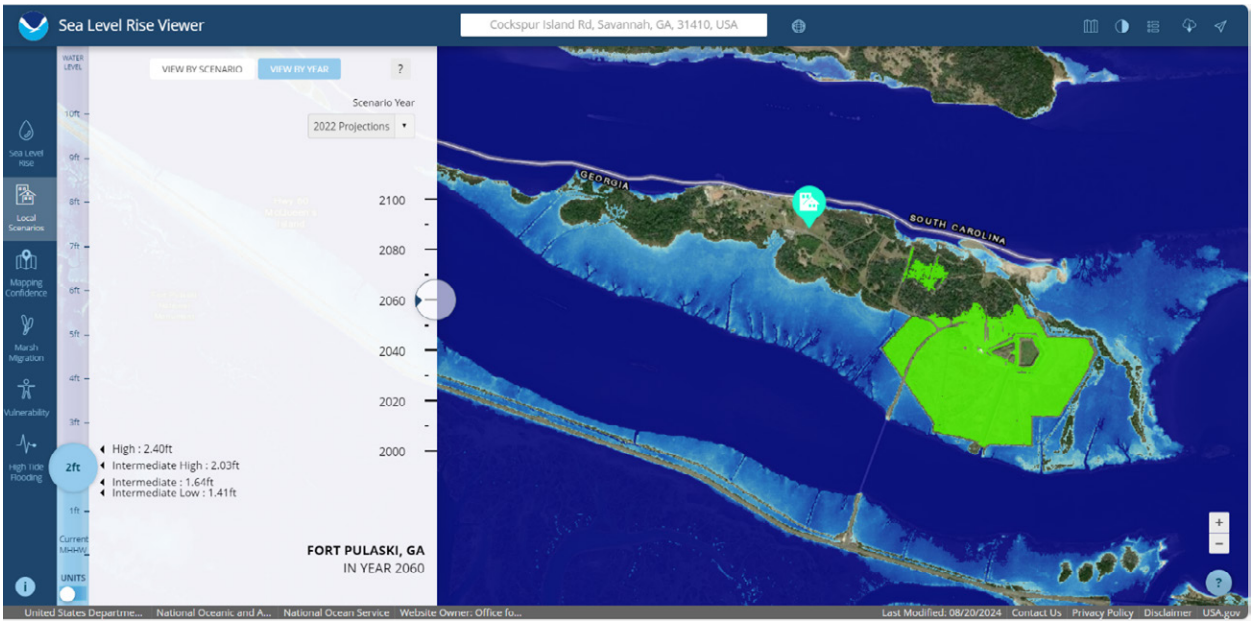


FIGURE 14. PROJECTED SEA LEVEL RISE IN 2060

Currently, there is no practicable alternative outside the floodplain to maintain the historic and administrative structures currently in use at Fort Pulaski National Monument. The primary justification for the use of the floodplain is because the park was established to preserve the fort and interpret that period of history. Therefore, the park needs to retain maintenance and administrative structures on Cockspur Island to fulfill essential functions. In addition, notable costs and land disturbing impacts would be incurred by moving or constructing these facilities in new locations outside the floodplain. Park managers would continue to implement its Severe Weather Action Plan (SWEAP) for all park staff and facilities on Cockspur Island (NPS 2024c). Although the project sites are in areas subject to flooding, there would be ample time to warn staff and visitors using the facilities to evacuate the area. If a flood occurred, visitors and staff could evacuate to higher ground via US Highway 80.

Trends, Ongoing Actions, and Planned Actions

The Corps of Engineers' separate but concurrent project to rehabilitate the ditch and dike system is expected to enhance flood resilience and protect the heavy masonry fort. This effort would involve trenching and earth-moving activities and would remove some vegetation in the floodplain during construction. Long-term benefits to the island's hydrological stability and floodplain functions are anticipated to improve the monument's salt marsh and habitat values near the project area. Similarly, dredging activities by the Corps of Engineers to maintain the shipping channel can cause shoreline erosion, alter the Savannah River flow, and have unpredictable impacts on Cockspur Island's floodplain functions.

Changes in climate may considerably affect vegetation phenology across the floodplain (e.g., periodic plant and animal life cycle events and how these are influenced by seasonal and interannual variations in climate). Most observed changes are linked with temperature change or altered moisture availability (NPS 2013). Climate change and the unpredictability of large storm events may substantially alter the park's shorelines and hydrology (e.g., historic drainage patterns). Sea level rise at the fort location in the floodplain, for example, could range from 1.42 feet in an intermediate scenario to 2 feet or more of rise in a high scenario by 2060 (NOAA 2024). While impact projections vary in magnitude, large storm events can inundate ponds and surface waters with harmful saltwater intrusions and sedimentation that can create toxic, stagnant soil conditions, which stress native vegetation communities. Saltwater intrusion is the leading edge of sea level rise, preceding tidal inundation. With climate change, saltwater is shifting landward into regions that previously have not experienced or adapted to salinity, leading to novel transitions in biogeochemistry, ecology, and human land uses (Tully et al. 2019).

Just outside the project area, the north shore of Cockspur Island and the adjacent salt marsh is particularly vulnerable to storm and erosion events. A 2,500-foot gap between revetments in the area creates eddies and scouring along the unprotected shoreline. Severe storms can exacerbate shoreline erosion, depending on the storm's direction.

Environmental Consequences of the Alternatives

Alternative A: No Action

Direct and Indirect Impacts

As noted, all of Cockspur Island is located in the 100-year floodplain. The existing maintenance facility and VIP campsites are located upland from salt marsh and shallow coastal areas more prone to flooding (figure 14). By comparison, the existing entrance station and visitor parking area are a few feet lower in elevation and are more prone to flooding. Beyond flood impacts, storm events would contribute incremental damage to park facilities, possibly shuddering utilities services indefinitely. Visitor amenities, such as restrooms, would continue to be compromised by storm and flood impacts and may become permanently damaged and inoperable.

However, the facilities themselves have little impact on floodplain values, as they're constructed on reclaimed dredge spoils and located inland from the dynamic, tidally influenced salt marsh. Compliance with applicable standards, regulations, and policies to minimize impacts on

floodplain resources and the loss of property or human life would continue under the no-action alternative. With these measures, the no-action alternative would not alter flood flows and would continue to have relatively insignificant effects on floodplain functions and values.



FIGURE 15. SHALLOW COASTAL FLOODING AREAS

Cumulative Impacts

Ground disturbance associated with the USACE ditch and dike rehabilitation would have several long-term impacts on floodplains. While the rehabilitation project would provide valuable flood protection for park resources and the dike itself from harmful wave action and encroaching sediment buildup, natural floodplain functionality would continue to decrease across the highly engineered Savannah River system. On Cockspur Island, the development of a new road through salt marsh and heavy equipment would compact wet soils and gouge, rut, and disturb the floodplain during construction activities.

Conclusions

Under the no-action alternative, climate change and the unpredictability of large storms that could alter the park's shorelines would continue. Extended sea level rise and physical damage from storm surge may also decrease protective vegetation cover over time and reduce floodplain functionality and dynamism. Therefore, the no-action alternative would allow and accept large-scale changes and long-term, adverse impacts on floodplains and the island's hydrology in the Savannah River system.

Alternative B: Proposed Action and Preferred Alternative

Direct and Indirect Impacts

Due to the nature of flood risks on Cockspur Island, proposed activities would slightly increase the nonpermeable surface area on the island and would have an incremental adverse impact on floodplain values that support ecosystem quality (e.g., dissipation of floodwater and sedimentation processes). Accordingly, this preliminary flood risk assessment is provided for public review before construction and the implementation of plan/environmental assessment

actions. To a small degree, relative to regional stressors impacting floodplain functions and coastal hydrology, proposed project actions would contribute to a decrease in natural floodplain functionality and resiliency across the highly engineered Savannah River system. Given that the majority of proposed facility and infrastructure development in the plan/environmental assessment would be constructed on previously disturbed sites, elevated upon dredge spoils, natural resource floodplain value loss would be minimal at these locations.

Coupled with climate change, however, the unpredictability of large storm events may substantially alter the park's shorelines, hydrology, and floodplain functions. Extended sea level rise and physical damage from storm surge may also decrease protective vegetation cover over time and substantially reduce floodplain functionality and dynamism. Similarly, large storm events can inundate ponds and surface waters with harmful saltwater intrusions and sedimentation that can create toxic, stagnant soil conditions, which stress native vegetation communities and degrade floodplain functionality (Tully et al. 2019). Therefore, the proposed plan/environmental assessment actions would allow and accept large-scale changes and long-term, potentially substantial adverse impacts on floodplains and the island's hydrology in the Savannah River system. Risks and impacts on property include damage to park buildings and infrastructure, including the undermining of roads. The timing and duration of potential flooding on Cockspur Island and the level of damage to property would vary depending on storm intensity and the ensuing sea level rise.

Based on the proposed action's conceptual level of design, a floodplain statement of findings, per NPS Director's Order 77-2: *Floodplain Management* for adverse impacts on floodplain functions and values, cannot be adequately completed. Final site plans to construct and fully implement development activities in this plan would, however, require the preparation of a floodplain statement of findings and include appropriate mitigation measures. Including base elevations for proposed structures is an essential design detail, for example, that would be used to quantify impacts and inform detailed mitigation measures related to flood insurance regulations and building codes.

Although the entire preferred action would be located in the 100-year floodplain, the project area is on the highest and most flood-resilient NPS land on the island. The use of mitigation techniques, such as installing flood-resistant infrastructure in the floodplain, would minimize flood threats to facilities. Similarly, parkwide mitigation efforts to revegetate disturbed or bare soils with native seed mixes after large storms and install stormwater management features such as silt-fences and matting during construction projects would help minimize sedimentation impacts and support natural floodplain functions. Compliance with applicable standards, regulations, and policies to minimize impacts on floodplain resources and the loss of property or human life would be strictly adhered to during and after the construction. With these measures, the preferred action would not alter flood flows and would have negligible effects on floodplain functions or values. The proposed maintenance and administrative facility would be located on the highest part of the island and include building features that make the structure resilient to future flood events.

Cumulative Impacts

Similar to the no-action alternative, ground disturbance associated with the USACE ditch and dike rehabilitation would have several long-term impacts on floodplains. The rehabilitation project's long-term benefits to bolster protection for park resources from flood impacts would far outweigh adverse impacts from heavy trenching through the island landscape and related construction activities to upgrade dike facilities. However, long-term, natural floodplain functionality and resiliency would continue to decrease across the highly engineered Savannah River system.

Conclusions

Due to Cockspur Island's existence in the 100-year floodplain, proposed development in the plan would incorporate mitigation techniques that include flood-resistant infrastructure and development activities that do not increase the flood threat. Proposed development would comply with applicable standards, regulations, and policies to minimize impacts on floodplain resources and loss of property or human life. With these measures, the preferred action would not appreciably alter flood flows and would contribute only slight, incremental adverse effects on floodplain functions.

Comparative Conclusion across Alternatives

Across the no-action and preferred alternatives, the unpredictability of large storm events and related climate change impacts that could substantially alter the park's shorelines, hydrology, and natural floodplain functions and values would continue indefinitely. Extended sea level rise and physical damage from storm surge would occur under each alternative and would reduce floodplain functionality and dynamism over time, depending on the severity and frequency of storm events. Both the no-action and preferred alternative would allow and accept large-scale changes and long-term, adverse impacts on floodplains and the island's hydrology in the Savannah River system. However, the preferred alternative would have greater benefits on floodplain values than the no-action alternative due to facility upgrades designed to increase resiliency of public assets to storm-related impacts and preserve resources from changing conditions.

WETLANDS

Affected Environment

Fort Pulaski and Cockspur Island's long history of strategic military importance has been substantially altered through decades of dredge spoil placement to build up the island's terrain and defensive structures. Although most of the island is composed of human-piled sediment, the landscape and vegetation are well established and comparable to adjacent natural islands (NPS 2024e). Soils are predominantly sandy and well drained, typical of coastal barrier islands on the Georgia coast. Naturally occurring coastal ecosystems include estuarine tidal marsh and maritime forests. Managed landscapes on the island include mowed turf lawns and impounded marsh wetlands that form the historic ditch and dike system surrounding the fort, which are distinct from the coastal estuary marshes outside of the dike impoundment.

The monument's wetlands are dynamic ecosystems that provide a beneficial interface between land and water and are afforded regulatory protection to preserve these important functions. They provide atmospheric stabilization, erosion and flood control, and groundwater recharge and remove pollutants and toxins from surface water. Wetlands can serve as breeding, nesting, and spawning grounds for fish and birds, for example, and provide a buffer from storms.

Trends, Ongoing Actions, and Planned Actions

The Corps of Engineers' separate but concurrent project to rehabilitate the ditch and dike system is expected to enhance flood resilience and protect the heavy masonry fort. This effort would involve trenching and earth-moving activities and would remove some vegetation in the floodplain during construction, which would adversely impact wetland areas. However, long-term benefits to the island's hydrological stability are anticipated to improve the monument's salt marsh functionality and habitat values near the project area. Similarly, dredging activities by the Corps of Engineers to maintain the shipping channel can cause shoreline erosion, alter the Savannah River flow, and have unpredictable impacts on Cockspur Island's wetland functions.

Changes in climate may considerably affect vegetation phenology—and the interplay among wetland functions—across Cockspur Island as well. Climate change and the unpredictability of large storm events may substantially alter the park's shorelines and hydrology (e.g., historic drainage patterns), of which wetland areas are core components. While impact projections vary in magnitude, large storm events, driven by the changing climate, can inundate ponds and surface waters with harmful saltwater intrusions and sedimentation. These conditions can create toxic, stagnant wetland soils, which stress native vegetation communities. In addition, saltwater is encroaching landward into regions that have not previously experienced or adapted to salinity, leading to novel transitions in biogeochemistry, wetland ecology, and human land uses (Tully et al. 2019).

Just outside the project area, the north shore of Cockspur Island and the adjacent salt marsh wetlands are particularly vulnerable to storm and erosion events. Severe storms can exacerbate shoreline erosion, which may increase the level of damage to wetlands depending on the storm's direction.

Environmental Consequences of the Alternatives

Alternative A: No Action

Direct and Indirect Impacts

Under current management, wetlands management would continue to follow guidance in the general management plan (2013) and the park's resource stewardship strategy (2024b). In addition, the park would adhere to regulations in Executive Order 11990, "Protection of Wetlands," issued by President Carter in 1977 "to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative. . . ." The executive order directs the National Park Service to (1) provide leadership and take action to minimize the destruction, loss, or degradation of wetlands, (2) preserve and enhance the natural and beneficial values of wetlands, and (3) avoid direct or indirect support of

new construction in wetlands unless there are no practicable alternatives to such construction and the preferred action includes all practicable measures to minimize harm to wetlands. Any proposed facilities or actions that would adversely impact jurisdictional "waters of the United States" are subject to regulations and mitigation requirements in section 404 of the Clean Water Act; methods for delineation of waters of the United States, as defined in the USACE *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the USACE *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0)* (USACE 2010); and NPS Director's Order 77-1: *Wetland Protection*. Accordingly, a wetland statement of findings per NPS Director's Order 77-1 would be required to further analyze and mitigate potential impacts on wetlands in this plan.

Cumulative Impacts

As sea level rise and storm surges continue to threaten resources near the project area, ongoing monitoring of island erosion and saltwater intrusion impacts adjacent to Cockspur Island would continue to occur to anticipate and mitigate further impacts on parklands.

Conclusions

Similar to floodplains, climate change and the unpredictability of large storms that could alter the park's wetlands and hydrological systems would continue under the no-action alternative. Extended sea level rise and physical damage from storm surge may also decrease protective vegetation cover over time and reduce wetland functionality and dynamism. Therefore, the no-action alternative would allow and accept large-scale changes and long-term, adverse impacts on wetlands and the island's hydrology in the Savannah River system.

Alternative B: Proposed Action and Preferred Alternative

Direct and Indirect Impacts

In anticipation of compliance documentation for construction projects proposed in the five study sites in this plan/environmental assessment, NPS wetland ecologist and professional wetland scientist, Byron Tsang, conducted a jurisdictional wetland delineation in July 2024 (see appendix E).

In general, there would be no impacts on wetlands at four of the five project sites in the plan/environmental assessment. These sites include the proposed administrative and maintenance building, picnic area and campsite improvements, and visitor center area and parking additions.

However, proposed projects included in relocating the entrance station and providing a queuing lane for entry would impact wetlands and require mitigation to construct these facilities (NPS 2024e). If not avoidable, wetland impacts associated with new construction for these proposed improvements would require a wetland statement of findings per NPS Director's Order 77-1 and compensatory mitigation to meet regulatory and procedural requirements before facility development.

Related to proposed activities in the plan/environmental assessment, note that the maintenance of existing facilities in wetlands is an excepted action under PM 77-1 § 4.2.1.7: Maintenance,

Repair, or Renovation (but not full reconstruction or expansion) of currently serviceable facilities or structures (see appendix E). Under this exception, minor adverse wetland impacts are allowed, not to exceed 0.1 acre (4,356 square feet). This minor impact limit allows for design changes and construction access as required for a new or rehabilitated facility. This exception applies to alterations on existing trails and sidewalks but would *not* apply to the proposed widening of the road at the park entrance.

Regardless of the applicability of an excepted action, potential wetland impacts must still be avoided or minimized to the greatest practicable extent. Note that mitigation under NPS wetland protection policy is separate from and in addition to any compensatory mitigation required by other regulatory authorities, such as section 404 permitting.

Cumulative Impacts

Similar to the no-action alternative, ground disturbance associated with the USACE ditch and dike rehabilitation would have several long-term impacts on wetlands and island hydrology. The rehabilitation project's long-term benefits to bolster protection for wetlands and other park resources from flood impacts would far outweigh adverse impacts from heavy trenching through the island landscape and related construction activities to upgrade dike facilities.

Comparative Conclusion across Alternatives

Like floodplains, the unpredictability of large storm events and related climate change impacts across the no-action and preferred alternatives that could substantially alter the park's shorelines, hydrology, and natural floodplain functions and values would continue indefinitely. Extended sea level rise and physical damage from storm surge would occur under each alternative and would reduce wetland functionality and dynamism over time, depending on the severity and frequency of storm events. Both the no-action and preferred alternative would allow and accept large-scale changes and long-term, adverse impacts on wetlands and the island's hydrology in the Savannah River system. However, the preferred alternative would have greater benefits on wetland values than the no-action alternative due to facility upgrades designed to increase resiliency of public assets to storm-related impacts. When construction level design plans and future compliance measures are conducted for proposed facilities in the preferred alternative – and assuming impacts on wetlands would not be avoidable - this alternative could lead to compensatory mitigation actions that would provide a net to benefit wetland functions and values on Cockspur Island (NPS 2024e).

VEGETATION AND SOILS

Affected Environment

Soils that underlie the project area on Cockspur Island are composed of coastal sands and alluvial sediments deposited by the Savannah River approximately 4,500 years ago to the present (NPS 2022a). These soils occur in very poorly drained tidal marshes that have a clay-rich underlying layer and are flooded when tides are higher than normal. Another soil type—dredged sediment—covers most of Cockspur Island as a result of dredge and fill activities in the shipping channel of the Savannah River since the late 19th century. Salt marsh deposits comprise about half of the surface area on the island's southern side. Areas identified as "fringe

deposits" form a muddy, sandy intersection between the dredged soils and the non-buried areas of the salt marsh. Some of the dredged materials are confined by dikes (NPS 2013). The monument's complex network of earthworks from its protective periods of significance is woven into the island's earthen makeup as well. Dredged material can be up to 10 feet thick and may be contaminated with industrial waste from several facilities, including a nuclear weapons production plant, and discharge from wastewater treatment plants further upstream on the Savannah River. By comparison, salt marsh deposits can be up to 30 feet deep and composed of loamy to silty clay and clay loam (NPS 2022a).

Vegetative communities in low areas on Cockspur Island include salt marsh and spartina grass that transition into areas of dense shrub along the fringes of the marsh and forested uplands of pine, sabal palm, oak, and red cedar. Other areas of Cockspur Island—including the slightly higher, upland portions of the project area (approximately 11 feet above sea level)—are maintained as open lawns or fields around standing historic structures and park administrative buildings. In addition to grasses, these areas support a variety of other plant species, including eastern prickly pear (*Opuntia humifusa*) and buffalobur nightshade (*Solanum rostratum*), which can grow in large spreads on the island. A number of red cedars, palmettos, and sugarberry trees remain in the diked area surrounding the fort. Junipers and palmettos have been planted in mulched beds near the visitor center. Much of the area surrounding the fort, large areas to the east and south of the fort, and the central portion of Cockspur Island is managed as maintained grass. Efforts to reduce mowing activities in the west end of Cockspur Island are being implemented based on recommendations from the park's natural resource condition assessment. This habitat occupies more than 140 acres on Cockspur Island. A number of red cedars, palmettos, and sugarberry trees remain in the diked area surrounding the fort. Junipers and palmettos have been planted in mulched beds near the visitor center (NPS 2013).

As discussed in the floodplains section, all of Cockspur Island rests upon dynamic floodplains that hold sediment and floodwater. The floodplain system recharges groundwater, provides channel stability, and supports aquatic and terrestrial habitats for plants and animals. Flooding is critical to maintaining vegetation because the flood waters and high tidal surges transport sediment and nutrients from the river and ocean to the connecting floodplain (NPS 2015). Severe storms adversely impact soils, vegetation, and water quality as well, such as the recent flood events that destroyed park septic and restroom facilities in the picnic area.

Invasive plants are problematic in the project area. Invasive plant species compete with native biota, threaten or eliminate rare species, disrupt ecosystem processes such as nutrient cycling and disturbance regimes, and reduce food sources for native wildlife (NPS in prep).

Trends, Ongoing Actions, and Planned Actions

As discussed in the floodplains impact topic, the separate but concurrent USACE project to rehabilitate the ditch and dike system is expected to enhance flood resilience and protect the heavy masonry fort. This effort would involve trenching and earth-moving activities and would remove some vegetation in the fringe deposit areas during construction. Long-term benefits to the island's hydrological stability and floodplain functions are anticipated to improve the monument's salt marsh and habitat values near the project area as well. Similarly, dredging activities with the Corps of Engineers to maintain the shipping channel can cause shoreline

erosion and have unpredictable impacts on vegetation and soils on Cockspur Island by altering the Savannah River flow.

Changes in climate may significantly affect vegetation phenology (periodic plant and animal life cycle events and how these are influenced by seasonal and interannual variations in climate), morphology, distribution, growth, and reproduction. Most observed changes are linked with temperature change either directly or indirectly (e.g., altered moisture availability) (NPS 2013). Many plant species have experienced a shift in the timing of phenological events, such as blooming, in response to seasonal changes linked to climate change. Climate change and the unpredictability of large storm events that may substantially alter the park's shorelines and hydrology (e.g., historic drainage patterns), can also impact vulnerable vegetation. Sea level rise at the fort location, for example, could range from 1.42 feet in an intermediate scenario to 2 feet or more of rise in a high scenario by 2060 (NOAA 2024). While impact projections vary in magnitude, large storm events can inundate ponds and surface waters with harmful saltwater intrusions and sedimentation that can create toxic, stagnant soil conditions, which stress native vegetation communities.

Just outside the project area, the north shore of Cockspur Island and the adjacent salt marsh is particularly vulnerable to storm and erosion events. A 2,500-foot gap between revetments in the area creates eddies and scouring along the unprotected shoreline. Severe storms can exacerbate shoreline erosion, depending on the storm's direction. Potential increases in sedimentation may reduce light availability to benthic biota and disturb legacy contaminants trapped in the benthos. However, monument staff can use dredged material to create buffers against erosion and restore shorelines.

Runoff from park and local roads can also degrade water quality and negatively impact soils and vegetation in the project area. The park uses stormwater management features such as silt fences, sediment logs, and erosion matting to minimize sedimentation from heavy runoff events. Managers employ mitigation measures such as planting native seed mixes to revegetate disturbed or bare soils and to maintain Clean Water Act water quality standards as well. When runoff occurs after a large storm, the relatively small levels of chemicals released in the park combine with a variety of contaminants that flow into the Savannah River from numerous industrial sources in the Savannah vicinity. These sources include wastewater treatment plants, a paper mill, natural gas processing facility, and a nuclear weapons production facility further upstream (NPS 2015). Contaminants include microfibers and polycyclic aromatic hydrocarbons, a class of chemicals released from burning coal, oil, and gasoline. It is anticipated that best management practices to reduce shoreline erosion and control sediment and contaminants from leaving these sites are being implemented due to permitting requirements. However, park managers cannot be certain these actions are rigorously applied. Some areas would be also revegetated after large storm events using native species or, more proactively, through current restoration efforts in the Savannah vicinity.

Excess nutrient loading from local land uses also causes excessive plant and algae growth and eutrophication and depletes oxygen available to aquatic organisms. Failing septic tanks can also leak improperly treated sewage into the environment, contaminating nearby water bodies and harming native plant and animal populations. In response, park managers are seeking funding

for a separate and concurrent effort to rehabilitate its wastewater systems to reduce vulnerability and potential impacts from groundwater intrusion and flooding.

Broader actions in the park vicinity include a Port of Savannah proposal to deepen the Savannah River channel to provide passage for larger ships, which would produce larger wake and increase erosion along shorelines. The deeper channel would also allow saltwater to migrate further up the Savannah River. Increased salinity could cause a transition to more salt-tolerant species in freshwater and brackish wetlands in the monument, decreasing levels of dissolved oxygen and harming or killing marine organisms. In addition, saltier waters could reduce the dike's vegetative cover, which assists in erosion control (NPS in prep). In addition, ballast water dumping from ships can introduce disease, aquatic invasive species, and water contaminants. Container ships may also carry insect pests.

Environmental Consequences of the Alternatives

Alternative A: No Action

Direct and Indirect Impacts

Under the no-action alternative, current management would continue as described in the affected environment section, which has little adverse impact on soils and vegetation. Under the no-action alternative, the current management of vegetation and soils would continue to follow guidance in the general management plan (2013) and the park's resource stewardship strategy (2024b). Fort Pulaski facilities, including the entrance station, fort parking, picnic area, and maintenance facility would remain in the same locations and current visitor access would continue. Parking at the picnic area would remain unimproved and insufficient to meet the needs of buses and oversized vehicles, leading to unauthorized parking, trampling vegetation, and bare ground near visitor facilities.

Major storm events would continue to inundate some of these sites—damaging cultural and historic resources, as well as park infrastructure in the process—but would have little impact on the natural functionality of the island's soils and vegetation in the project area in the short term. Extended sea level rise and physical damage from storm surge may degrade vegetation in the long term, however. Therefore, no action would allow and accept large-scale changes and adverse impacts on vegetative communities. While these actions would continue to compact soils in these areas, they would not have an appreciable impact on vegetation communities or function because these sites have been used previously for administrative functions, and ground disturbance is limited to only a few existing parking spaces at the current maintenance facility).

In addition, current visitor use activities would continue at the visitor contact station and at the entrance station, fort parking lots, and maintenance facility, which would have no added impacts on soils and vegetation.

Cumulative Impacts

When the incremental impacts of the no-action alternative are combined with the past, present, and reasonably foreseeable actions described in the affected environment section, overall cumulative impacts on vegetation and soils would continue to be long term and adverse. While past, present, and future actions, such as the USACE ditch and dike rehabilitation, would reduce

some impacts of severe storms and floods, saltwater intrusion near the project area and invasive plant infestations would continue to occur. When considered in the context of climate change impacts on the Cockspur Island landscape, the beneficial increment of the ditch and dike rehabilitation would be small, as major storm events would continue to dictate changes in vegetative communities and overall ecosystem health on the island. Therefore, the no-action alternative would contribute to long-lasting and concentrated areas of disturbance to vegetation and soils. The park's roads and trails would continue to divert stormwater runoff and increase erosion. Local road improvements and maintenance projects (both in and outside the park) may also alter hydrology and impact vegetation. Impacts from these activities often extend beyond the footprint of the road due to staging heavy equipment and working on roadway shoulders. Right-of-way maintenance along roads could cause a loss of vegetation and pollinators by over-spraying harmful pesticides as well.

Alternative B: Proposed Action and Preferred Alternative

Direct and Indirect Impacts

Compared to the overall acreage of the project sites in Cockspur Island as a whole, ground disturbing and vegetation clearing activities under the preferred alternative would have little adverse effects on vegetation and soils. For example, ground-disturbing actions for relocating restrooms in the picnic area would clear 0.26 acres of primarily grassy areas and add approximately 0.2 acres of gravel parking lot and 0.05 acres of concrete for pedestrian paths and vehicle use. Similarly, the development of a third tier of parking and a large vehicle turnaround added to the visitor center parking area would involve clearing approximately 0.12 acres of grassy areas and pouring a surface area of about one-half acre for the new asphalt parking lot. Total ground-clearing and ground-disturbing activities among the project sites under the preferred alternative are less than 2.5 acres. When compared to the total upland acreage of Cockspur Island (i.e., not including salt marsh areas), ground-disturbing activities under the preferred alternative comprise less than 1% of the approximately 240-acre project area, which is a relatively insignificant area of impact compared to the island's soil systems and vegetative communities as a whole. Sites proposed for development in the project area would avoid sensitive soils and vegetation communities and incorporate minimum disturbance footprints to meet the purpose and need of the preferred action. Site management best practices would include the selection of durable, resilient, and aesthetically appropriate surfaces to support the plan's facilities upgrades and related circulation and accessibility improvements. Implementing erosion and sedimentation control best practices during construction (e.g., silt fences and matting) and planting native seed mixes to revegetate disturbed areas after construction activities would help mitigate the small-scale adverse effects on vegetation and soils.

Under the preferred alternative, ground disturbance associated with proposed construction and relocation activities would have short- and long-term adverse impacts on soils and vegetation in the project area. Trenching and the installation of utility lines at the new entrance station, widening the park entrance road, developing a new parking area near the visitor center, relocating campsites, and constructing a new maintenance and administrative facility would impact soils and vegetation during these construction periods. Impacts would occur from clearing grassy areas and removing some trees, brush, stumps, and debris for new infrastructure, shallow digging, and filling activities to prepare sites for concrete and asphalt surfaces.

Constructing the new maintenance and administrative structure would compact and disturb soils by vehicles and heavy equipment in staging areas. Overall impacts on soils and vegetation from proposed development activities would be local and long term and minimized by the use of best management practices during clearing and construction. The new maintenance, resource, and law enforcement complex would be constructed on the highest available ground on the island, which is a more sustainable and resilient site related to future storm events.

Cumulative Impacts

The impacts of past, present, and reasonably foreseeable future actions are described above in the trends and planned actions section. Permanent soil loss resulting from regional land uses and development would adversely impact soils. Similarly, regional growth is expected to result in an increase in the conversion of natural lands to developed areas and thereby increase the amount of disturbed land available for colonization by nonnative species, causing long-term, adverse impacts on native vegetation. The impact of these actions on soils is expected to be adverse and long term. When the local, short- and long-term, direct, small-scale adverse effects of implementing the actions under alternative B are added to the effects of other past, present, and reasonably foreseeable actions described previously, there would be a long-term, adverse cumulative impact on vegetation and soils. The actions under alternative B would contribute a very small increment to this cumulative impact. Park managers would continue to use stormwater management features, such as silt fences, sediment logs, and erosion matting, to minimize sedimentation from heavy runoff events. Managers would also employ mitigation measures such as planting native seed mixes to revegetate disturbed or bare soils after large storms and construction projects.

Comparative Conclusion across Alternatives

Overall, there would be no-to-little new ground disturbance activities under the no-action alternative and small-scale impacts on soils and vegetation when compared to the project area as a whole.

VISITOR USE AND EXPERIENCE

Affected Environment

Overview

Visitor use refers to human presence in an area for recreational purposes, including education, interpretation, inspiration, and physical and mental health. Visitor experience is the perceptions, feelings, and reactions that a visitor has before, during, and after a visit to an area. Although set aside by Congress to protect Fort Pulaski, this site now tells more inclusive stories and serves as an important green space for the area.

Visitor Experience and Opportunities

Fort Pulaski National Monument exists as one of the best preserved "Third System" US coastal defense forts built in the early 1800s, and touring the fort structure is the primary visitor experience on Cockspur Island. The fort has stood at the mouth of the Savannah River for over 150 years. The fort also served as an important stop on the Underground Railroad after Union

Major General David Hunter issued General Orders No. 7 on April 13, 1862, freeing those enslaved on Cockspur Island and at the fort.

According to the park's business plan (NPS 2015), visitors drawn to Fort Pulaski each year include historians or descendants, out-of-town vacationers looking for an NPS experience, and locals who come to fish, bird watch, picnic in the park, or walk their dogs on the well-preserved nature trails. The park maintains 5.5 miles of official trail. Currently, both the North Shoreline and part of the McQueens trails are closed due to storm damage. A picnic area is located on Cockspur Island Road, but it currently does not meet accessibility standards, and the restrooms are not open due to storm damage and septic failure. Fishing is a popular local activity and is permitted around Cockspur Island. After business hours fishing is permitted from the Cockspur Island Bridge.

The park's visitor center is located near Fort Pulaski, where staff assist with park orientation and answer questions. Currently, visitors cross traffic after parking to access the park visitor center, and buses and oversized vehicles do not have official parking.

Visitor Use

Most visitors enter the national park by car from US Highway 80. Visitors are almost immediately greeted by a park ranger at the entrance booth on Fort Pulaski Road. During slower seasons and depending on staff availability, the entrance station can be unstaffed. During unstaffed times, instructions on the booth direct visitors to the visitor center for orientation and to pay the park entrance fee. Most visitors continue along Fort Pulaski Road to the park visitor center before walking to Fort Pulaski. Visitors can also turn onto Cockspur Island Road to visit the picnic areas and access trailheads.

Fort Pulaski National Monument is open year-round from 9:00 a.m. to 5:00 pm, except for New Year, Thanksgiving, Christmas Day, and storm events. The last entry into the park is at 4:30 pm. Before storm events, Cockspur Island closes to visitors for safety and to allow staff time to prepare for storm events (e.g., securing buildings). Because of increased storm surge, park staff need to not only secure buildings but elevate items inside them. Moving and preparing for storms results in a loss of visitor access.

The park offers several special events each year, including living history, candle lanterns tours, a park birthday celebration, and Siege weekend.

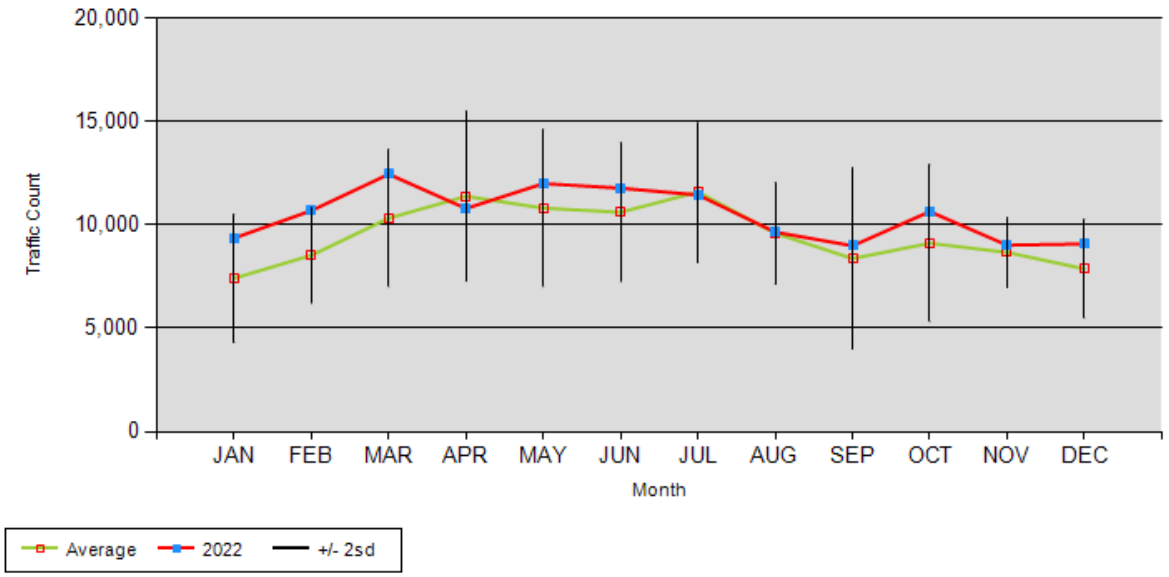


FIGURE 16. TRAFFIC COUNT AT COCKSPUR ISLAND, 2012–2022

Visitor Use and Experience Trends and Planned Actions

Factors that may increase or decrease future visitation levels include population changes, economic trends, travel costs, leisure time availability, future disposable income, climate change, and changes in activity preferences.

Visitor use patterns are anticipated to be impacted by climate change throughout the national park system, including when, where, and how visitors recreate (Fisichelli et al. 2015). Because of Cockspur Island's physical location and historic drainage system, the monument and its resources are particularly vulnerable. Sea level rise has the potential to impair the use of gravity in these historic drainage systems that draw water away from the land on which the fort is constructed, and any increase in groundwater levels could also disrupt the island's drainage. Any shift in water levels could contribute to flooding in the fort's substructure, as well as cause increases in mold, dampness, and standing water, all of which lead to rot and waterlogged vegetation. In the event of a hurricane or severe flooding, the historic 1830s fabric of the fort could be damaged or destroyed, and US Highway 80, the only access point to the monument, could be submerged underwater.

The City of Savannah, the metropolitan area nearest to Fort Pulaski, has seen a 13% growth rate in the last decade, which is more than double the US growth rate (Savannah Economic Development Authority 2023). This trend may lead to increased use a Fort Pulaski as an important green space for the city of Savannah.

Reasonably foreseeable future actions in the project area that may impact visitor use and experience include the rehabilitation of the wastewater system and the ditch and dike system.

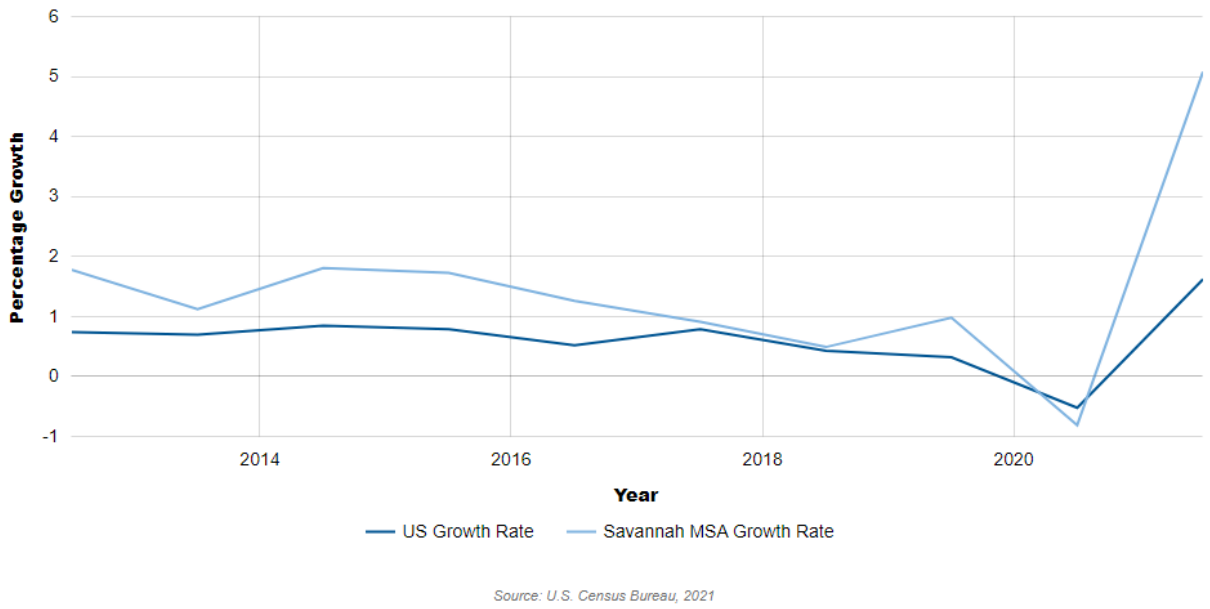


FIGURE 17. GROWTH RATE OF VISITOR USE AT FORT PULASKI NATIONAL MONUMENT

Environmental Consequences of the Alternatives

Alternative A: No Action

Direct and Indirect Impacts

Under alternative A, current management would continue as described in the affected environment section. Park infrastructure, such as the entrance station, fort parking, and maintenance facility, would be in the same locations and conditions. Desired conditions, indicators, thresholds, and visitor capacities for the site would not be implemented. Impacts of storm events would cause disruption to park operations and negatively impact visitor experience and access. The park would continue to close up to five days before predicted storm events to allow time to move equipment and secure buildings.

Cumulative Impacts

The impacts of past, present, and reasonably foreseeable future actions are described above in trends and planned actions section. No new impacts on visitor use and experience would occur under alternative A. Issues and experiences associated with early closings due to storm events would continue.

Alternative B: Proposed Action and Preferred Alternative

Direct and Indirect Impacts

The desired conditions, indicators and thresholds, and visitor capacities established in alternative B would provide a new framework for evaluating and managing visitor use while protecting important resources and experiences. The suite of potential management strategies

included as part of the indicators, thresholds, and visitor capacities would generally have beneficial impacts on visitor use and experience.

Under alternative B, the visitor capacity for day-to-day use is established above current use levels. This strategy would allow for overall park visitation to increase over time, either naturally or via park-initiated efforts to attract more visitors while ensuring that appropriate strategies are in place that prevent impacts from occurring. Implementing visitor capacities for the site helps ensure that desired conditions are achieved, having a beneficial impact on visitor use and experience; the exception would be if visitation nears or reaches capacity, an adverse impact could occur on a subset of visitors who would not be able to visit on their desired day or may be temporarily displaced from the park to a different day.

Under this alternative, 14 additional standard parking spaces and approximately 4 large bus spaces would be added, improving the visitor experience when visitation is temporally and spatially concentrated. A more sustainable maintenance facility would prevent early park closings to prepare for storms, positively impacting the visitor experience. The park entrance station would be moved as well, which would relieve incoming Fort Pulaski traffic on Highway 80, improving safety for visitors and staff and reduce animal crossing mortalities. Moving the park entrance station could both positively and negatively impact the visitor experience. Because visitors would travel approximately three-quarters of a mile before seeing a ranger, they could think they are lost or going in the wrong direction. Visitor safety would be positively impacted, with no risk of visitors backing into US Highway 80.

Cumulative Impacts

The impacts of past, present, and reasonably foreseeable future actions are described above in trends and planned actions section. Alternative B would contribute long-lasting and broad beneficial impacts on visitor use and experience because of the comprehensive improvements to the built environment, interpretive offerings, and visitor use management direction, which affect all visitors.

Comparative Conclusion across Alternatives

Under alternative A, current management would continue as described in the affected environment section, and, therefore, there would be no new direct or cumulative impacts on visitor use and experience. A potential negative impact could occur on the visitor experience when the park has to close an additional day earlier than other park units to prepare for storm events.

Alternative B would contribute long-lasting and broad beneficial impacts on visitor use and experience at Fort Pulaski because of the increased efficiency in park operations specifically related to storm events. Additional paved parking would be provided, and visitors would no longer need to cross traffic to access Fort Pulaski. Moving the entrance station is anticipated to have a positive impact on the visitor experience by relieving the traffic burden and reducing accidents on US Highway 80. Taken together, the impacts of implementing the actions in alternative B would contribute an overall beneficial impact on visitor use and experience. When the impacts of alternative B are combined with impacts of other past, present, and reasonably

foreseeable future actions and trends, the overall cumulative impact on visitor use and experience would continue to be beneficial.

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Appendixes





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APPENDIX A: IMPACT TOPICS CONSIDERED BUT DISMISSED FROM DETAILED ANALYSIS

The following impact topics are not analyzed because they do not exist in the project area; they would not be affected by the proposal; the likelihood of impacts are not reasonably expected, or, through the application of mitigation measures, there would be no potential for significant effects; and they were not a subject of contention among the public and other agencies.

ETHNOGRAPHIC RESOURCES

An ethnographic resource is defined as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (NPS Director's Order 28: *Cultural Resource Management*, 157). Currently, the Cultural Resources Inventory System has no ethnographic resources recorded for the park; however, an ethnographic overview and assessment has never been prepared for Fort Pulaski. The park's foundation document (2016) identified an ethnographic overview and assessment as a data need in relation to the WWII bunkers, fishing and boating locations for local communities, and the McQueens Island salt marsh. A funding request for an ethnographic overview and assessment has been submitted (PMIS 209115) but not yet funded. No actions in this plan are anticipated to impact Fort Pulaski National Monument's potential ethnographic resources related to the WWII bunkers, fishing and boating locations for the local community, or the McQueens Island salt marsh. Therefore, ethnographic resources were dismissed as an impact topic for further analysis in this environmental assessment. Should an ethnographic overview and assessment be funded and new ethnographic resources identified, the results of that report will inform actions in this plan.

Museum Collections

Museum collections (objects, specimens, and archival and manuscript collections) are important park resources in their own right, as well as being valuable for the information they provide about processes, events, and interactions among people and the environment. Most of the museum collection has been moved to the Southeast Archeological Center. The few museum collection objects remaining on site in the visitor center and the objects still be analyzed in the resources trailer would not be impacted by the actions of this plan. Therefore, museum collections were dismissed as an impact topic for further analysis in this environmental assessment.

Federally Listed Species

The Endangered Species Act of 1973, as amended, provides for the protection of rare, threatened, and endangered species, which are regulated by the US Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service. To safeguard these species and habitats, additional federal responsibilities are provided under the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and NPS policies and management guidelines. The official species list prepared for the plan indicates that there are 15 federally endangered, proposed

endangered, threatened, and candidate terrestrial and aquatic species that occur in the Cockspur Island vicinity (see table A-1 below). No critical or specific habitats are in or near the project sites (USFWS 2024).

While parts of Cockspur Island and the monument as a whole include areas where federally listed species, such as migratory wood stork stopover, park staff indicate that listed species are occasionally sited but seldom occur in the project sites. Rather, listed species that are present in the park tend to inhabit shorelines and riverine areas, which would not be impacted by plan actions. Some species included in table A-1, such as the eastern black rail and pondberry, are not known to occur in the park (Seifert, pers. comm., 2024d). Recent park consultation with USFWS staff on a separate effort to conduct historic landscape maintenance activities covering the majority of NPS jurisdiction on Cockspur Island (similar to the project area), confirmed the project would have no effect on listed species (NPS 2024d, 2024e). Correspondence between park and USFWS staff cited best available records, and information and similarly indicated that federally listed species and habitats to avoid are located on shorelines, marshes, and wetland areas.

Proposed activities in the project area would have no effect on these species or their habitat per section 7 of the Endangered Species Act. Land disturbance under the preferred action would be small and mainly involve the removal of nonnative, and some native, vegetation to restore selected historic sight lines. While the federally proposed endangered tricolored bat (*Perimyotis subflavus*) is not known to occur the project area, park staff would avoid removing trees during the species' winter torpor period and pup season to prevent any potential impacts. While constructing the proposed maintenance and administrative facility, as well as asphalt and concrete surfaces, would require earth-moving activities and small areas of permanent vegetation removal at the project sites, these areas do not provide habitat to federally listed species. Mitigative actions to protect wildlife and wildlife habitat would occur during normal monument operations, as well as before, during, and after construction, to prevent any possible impacts on federally listed species (e.g., brief stopover occurrences for birds). Other best practices related to federally listed species may include conducting surveys for rare, threatened, and endangered species, as warranted, and conducting construction activities outside of critical periods for any specific species noted below—though none are currently known to occur in the project area. Therefore, federally listed species are dismissed as an impact topic in this plan/environmental assessment.

Table A-1. Federally Listed and Candidate Species That May Occur in the Project Area

Species Type	Species Name	Federal Listing Status	Occurs in Project Area?
Mammal	Northern long-eared bat *Myotis septentrionalis*	Endangered	No
Mammal	Tricolored bat *Perimyotis subflavus*	Proposed Endangered	No
Mammal	West Indian manatee *Trichechus manatus*	Threatened	No
Bird	Eastern black rail *Laterallus jamaicensis* ssp. jamaicensis	Threatened	No
Bird	Piping plover *Charadrius melodus*	Threatened	No
Bird	Rufa red knot *Calidris canutus rufa*	Threatened	No
Bird	Wood stork *Mycteria americana*	Threatened	No
Reptile	Eastern indigo snake *Drymarchon couperi*	Threatened	No
Reptile	Green sea turtle *Chelonia mydas*	Threatened	No
Reptile	Hawksbill sea turtle *Eretmochelys imbricata*	Endangered	No
Reptile	Kemp's Ridley sea turtle *Lepidochelys kempii*	Endangered	No
Reptile	Leatherback sea turtle *Dermochelys coriacea*	Endangered	No
Reptile	Loggerhead sea turtle *Caretta caretta*	Threatened	No
Insect	Monarch butterfly *Danaus plexippus*	Candidate	No
Plant	Pondberry *Lindera melissifolia*	Endangered	No

Water Quality

National Park Service *Management Policies 2006*, NPS Director's Order 77: *Natural Resources Management*, and the Clean Water Act and other federal, state, and local regulations provide general direction for the protection of surface and groundwaters. The Atlantic Ocean bounds Cockspur Island to the east, while the north, south, and west of the island are bound by the North and South Channel of the Savannah River. The pollution of surface waters and

groundwaters by both point and nonpoint sources can adversely impact the natural functioning of aquatic and terrestrial ecosystems and diminish the utility of park waters for visitor use and enjoyment. *Management Policies 2006* states that the National Park Service would determine the quality of park surface and groundwater resources and avoid, whenever possible, the pollution of park waters by human activities occurring in and outside the parks. The preferred action would slightly increase the impervious surface area on the island, adding approximately 9,000 square feet of pavement to build the entrance queue lane, for example, which could increase the amount of sediment and roadway contaminants that would flow off these surfaces and into nearby salt marsh during storm events. However, mitigative stormwater management features, such as silt fences, sediment logs, and erosion matting to minimize sedimentation during construction periods and heavy runoff events, would be implemented to maintain water quality and meet Clean Water Act standards. Therefore, water quality was dismissed as an impact topic for further analysis in this environmental assessment.

APPENDIX B: CONCEPTUAL SITE PLANS

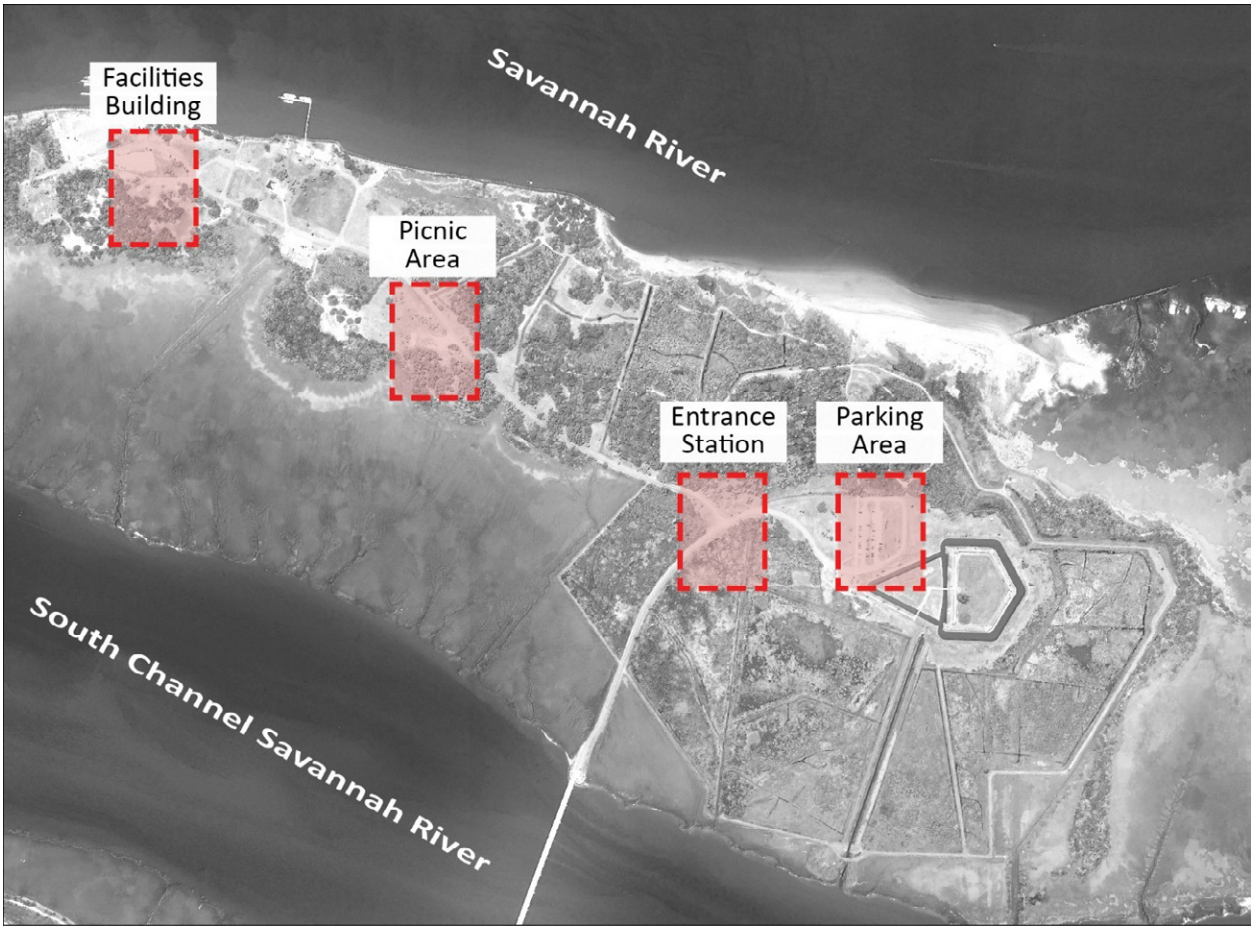


FIGURE B-1. CONTEXT MAP FOR FORT PULASKI NATIONAL MONUMENT

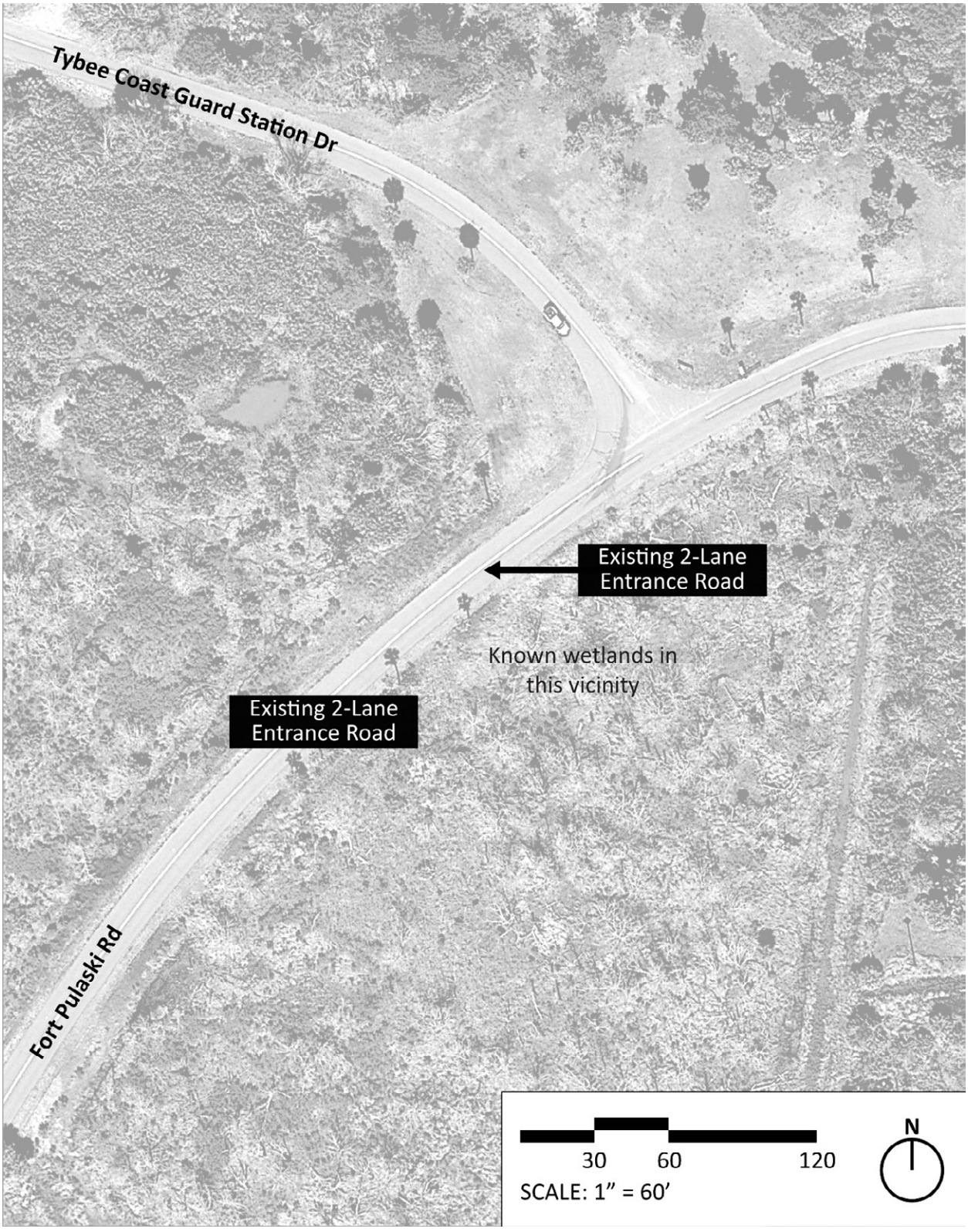


FIGURE B-2. ENTRANCE ROAD (EXISTING CONDITIONS) AT FORT PULASKI NATIONAL MONUMENT

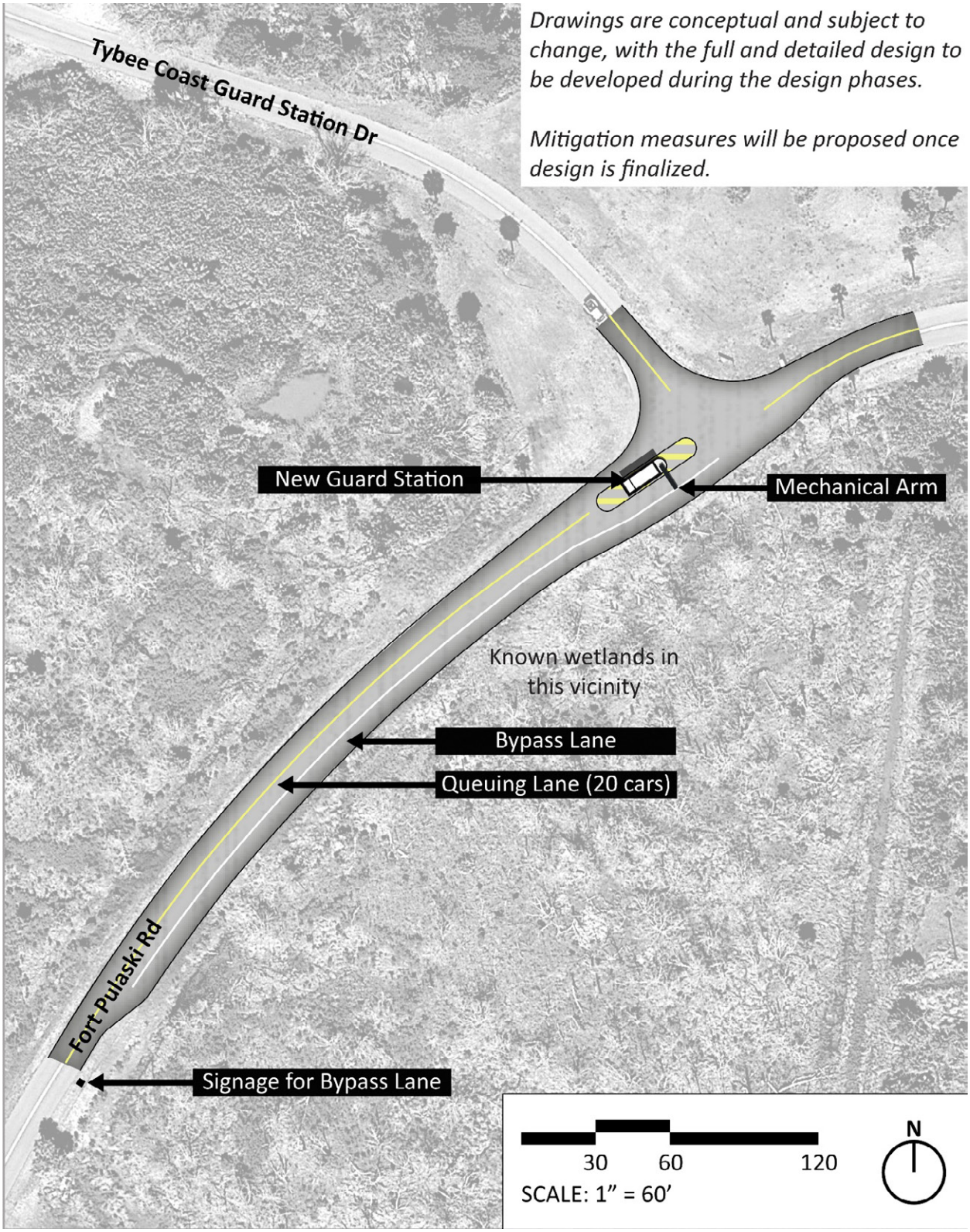


FIGURE B-3. ENTRANCE STATION, OPTION 1 (CONCEPTUAL DRAWING)

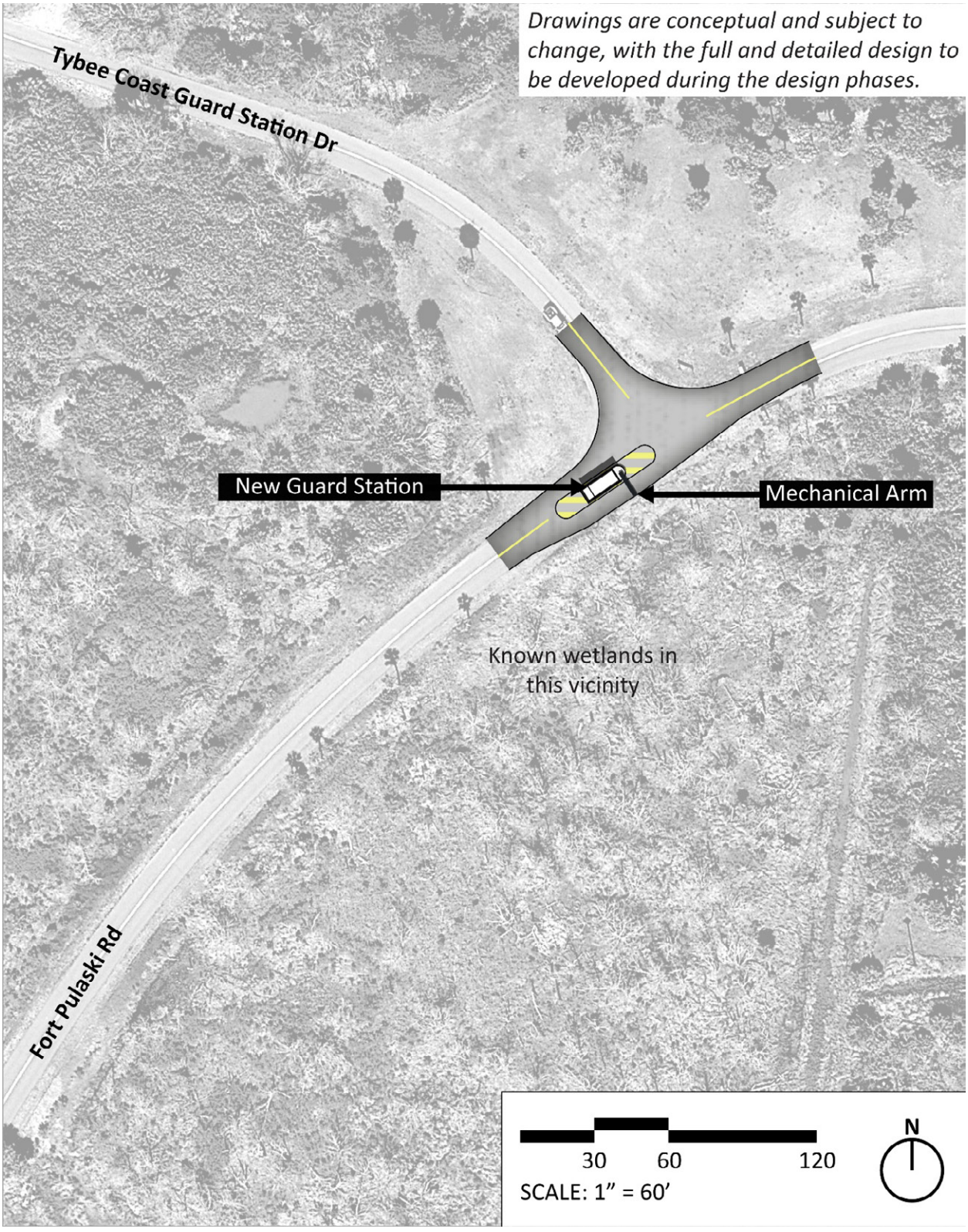


FIGURE B-4. ENTRANCE STATION, OPTION 2 (CONCEPTUAL DRAWING)

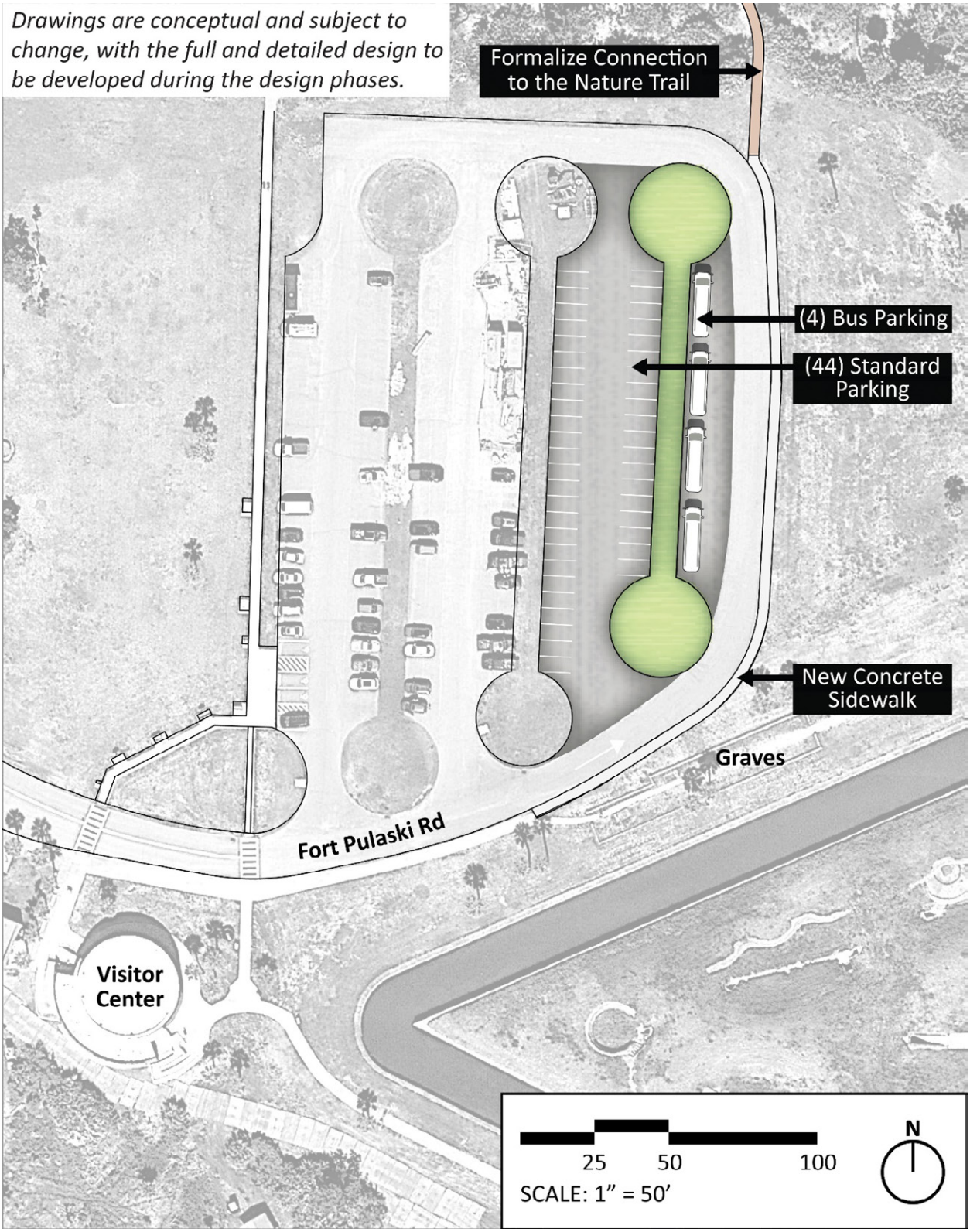


FIGURE B-5. PARKING AREA, OPTION 1 (CONCEPTUAL DRAWING)

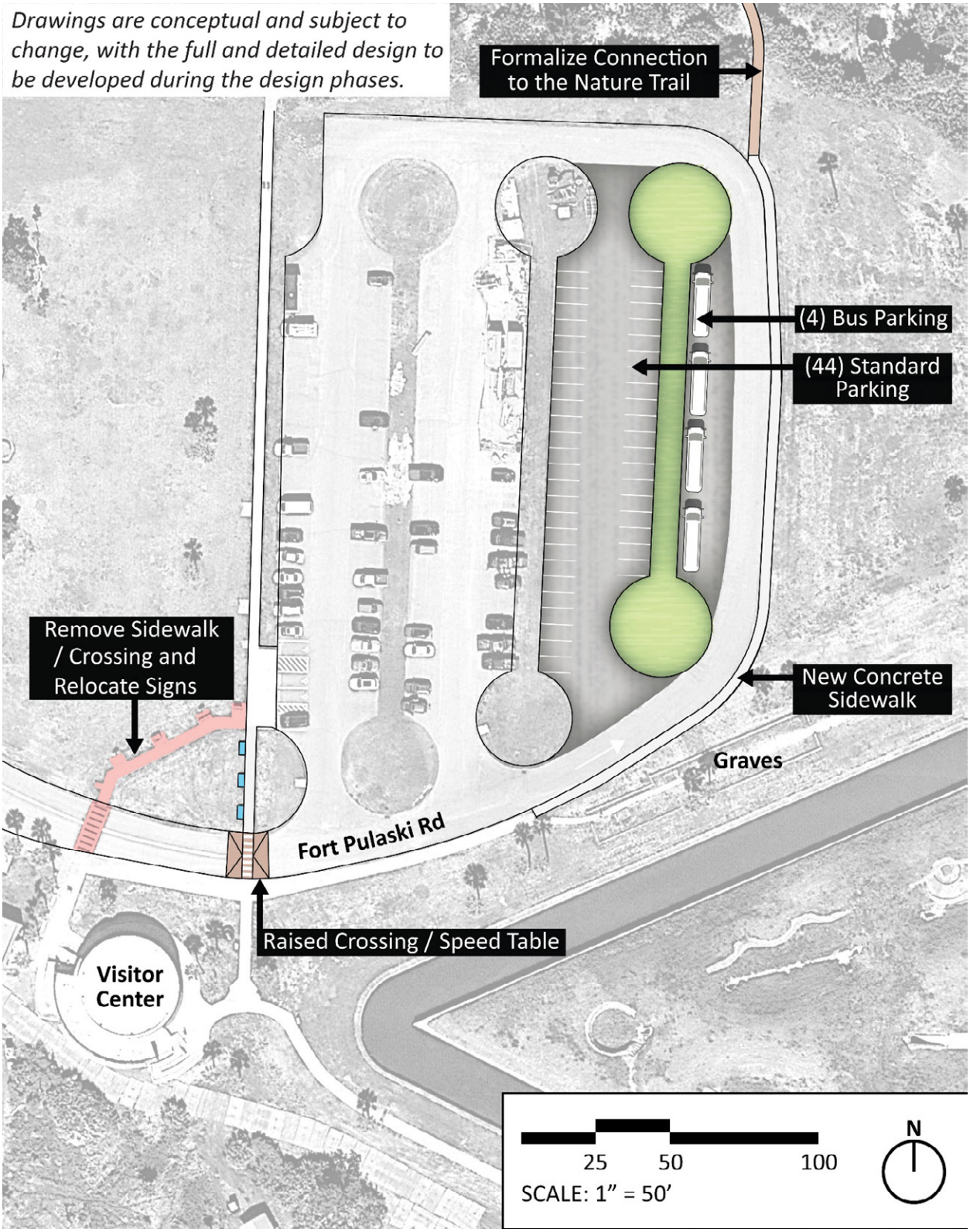


FIGURE B-6. PARKING AREA, OPTION 2 (CONCEPTUAL DRAWING)

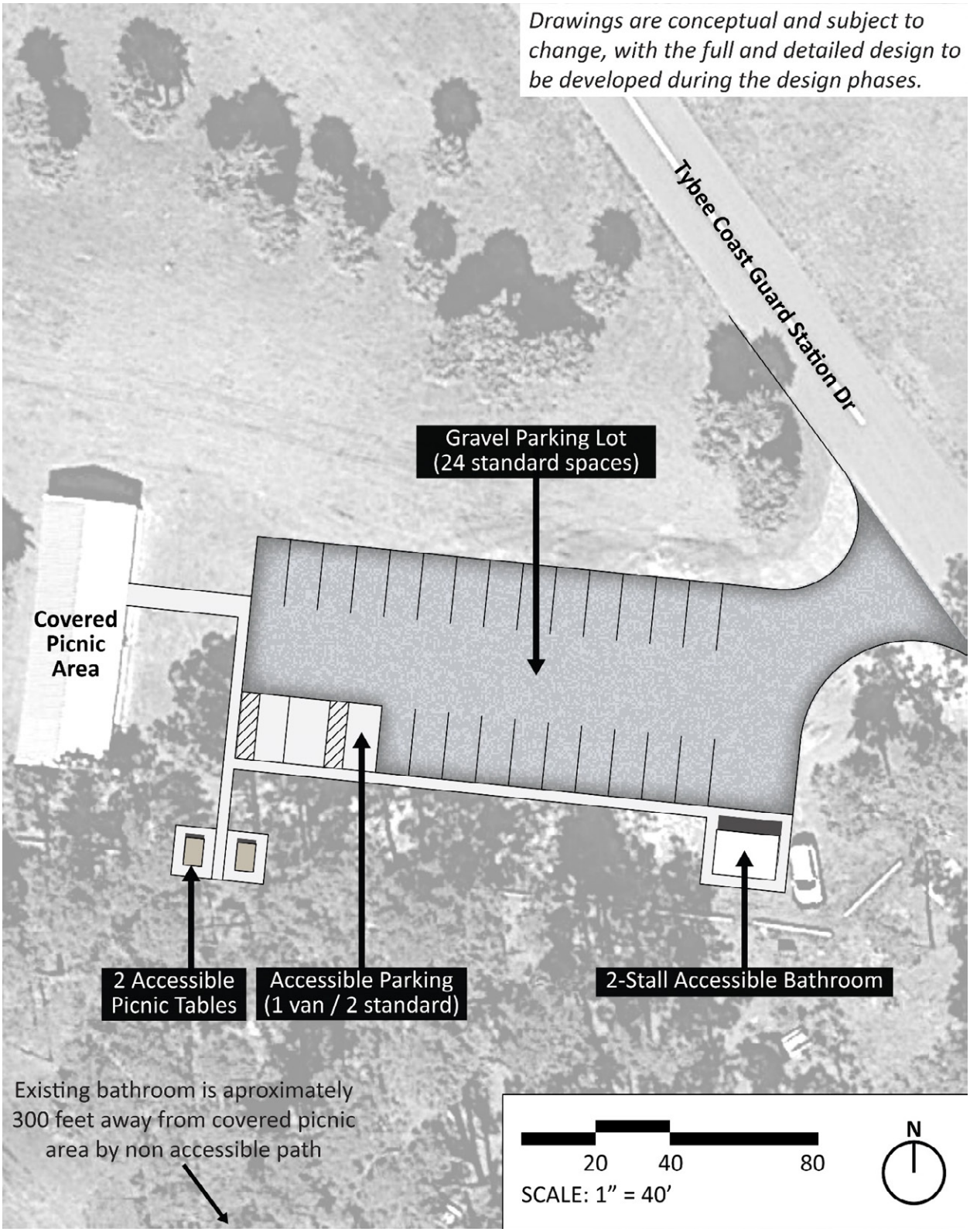


FIGURE B-7. PICNIC AREA (CONCEPTUAL DRAWING)

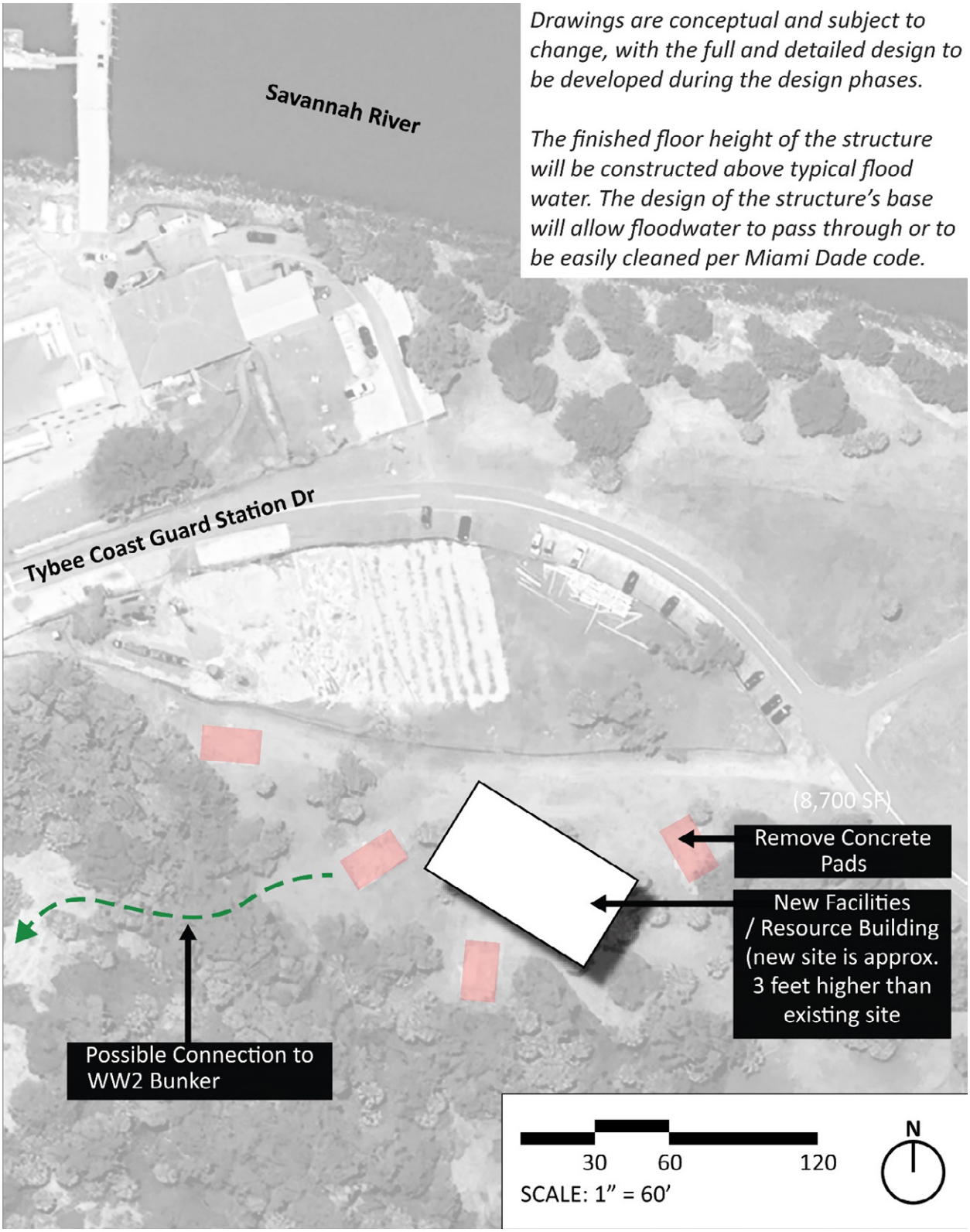


FIGURE B-8. FACILITIES BUILDING (CONCEPTUAL DRAWING)

APPENDIX C: VISITOR USE MANAGEMENT

VISITOR USE MANAGEMENT OVERVIEW

Visitor use management is the proactive and adaptive process of planning for and managing characteristics of visitor use and its physical and social setting and using a variety of strategies and tools to sustain desired resource conditions and visitor experiences. Visitor use management is important because the National Park Service strives to maximize opportunities and benefits for visitors while achieving and maintaining desired conditions for resources and visitor experiences in a particular area. Managing visitor access and use for visitor enjoyment and resource protection is inherently complex. It requires NPS managers to analyze not only the number of visitors but also where they go, what they do, their impacts on resources and visitor experiences, and the underlying causes of those impacts. Managers must acknowledge the dynamic nature of visitor use, the vulnerabilities of natural and cultural resources, and the need to be responsive to changing conditions.

This plan/environmental assessment employs the Visitor Use Management Framework (IVUMC 2016) and the visitor use management planning process to develop a long-term strategy for managing visitor use on Cockspur Island. The general planning process used for this plan is shown in figure C-1.

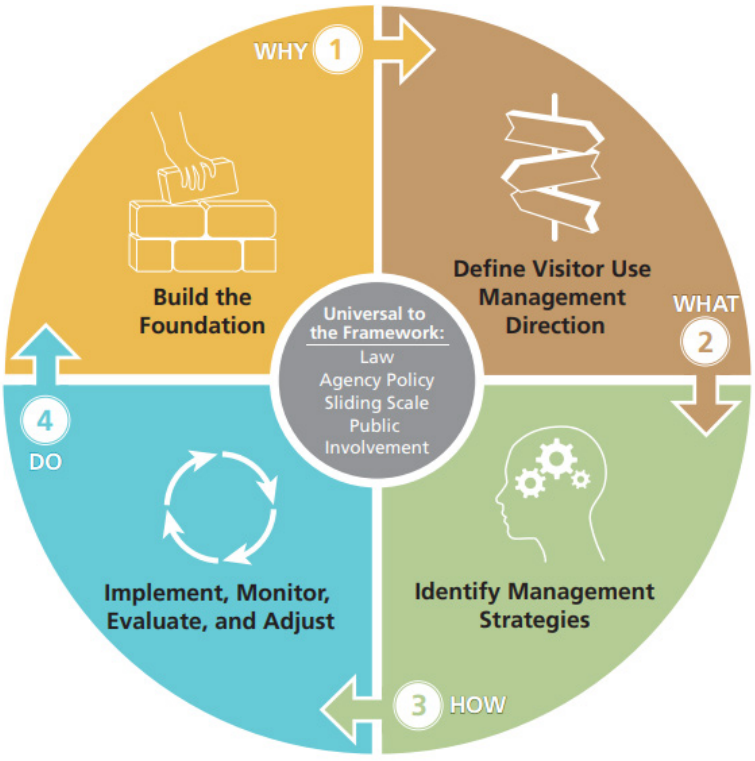


FIGURE C-1. OVERVIEW OF THE VISITOR USE MANAGEMENT FRAMEWORK (IVUMC 2016)

INDICATORS AND OBJECTIVES

Indicators are specific resource or experiential attributes that can be measured to track changes in conditions so that progress toward achieving and maintaining desired conditions can be assessed. An objective is defined as a specific result that a bureau aims to achieve; objectives are markers to help ensure positive progress toward achieving and maintaining desired conditions.

Because of the importance of visitor and staff safety, an indicator that would track the heat index and help ensure the park is focused on safety was selected.

The planning team identified management strategies associated with the indicator. Some of these strategies are currently in use and may be increased in response to changing conditions. The iterative practice of monitoring, implementing management strategies, and then continuing to monitor their effectiveness allows park managers to maximize benefits for visitors while achieving and maintaining desired conditions for visitor experiences in a dynamic setting.

Indicator Topic: Climate change and visitor and staff safety and well-being

Indicator: Number of days above moderate heat risk on the Occupational Safety and Health Administration (OSHA) Heat Safety Tool

Objective: Gain a better understanding of times and number of days the park is above a moderate heat risk so park staff can work to help ensure visitors are aware of the dangers of extreme heat and are able to have a positive and safe visitor experience.

Rationale: Climate modeling projects significant warming by 2050, with average annual temperatures ranging from +1.2°F to +5.1°F (NPS 2024a). Park visitors, especially vulnerable populations, are at risk when higher temperatures lead to heat waves.

Air-conditioned spaces available to park staff and the public are currently limited, especially in the historic fort.

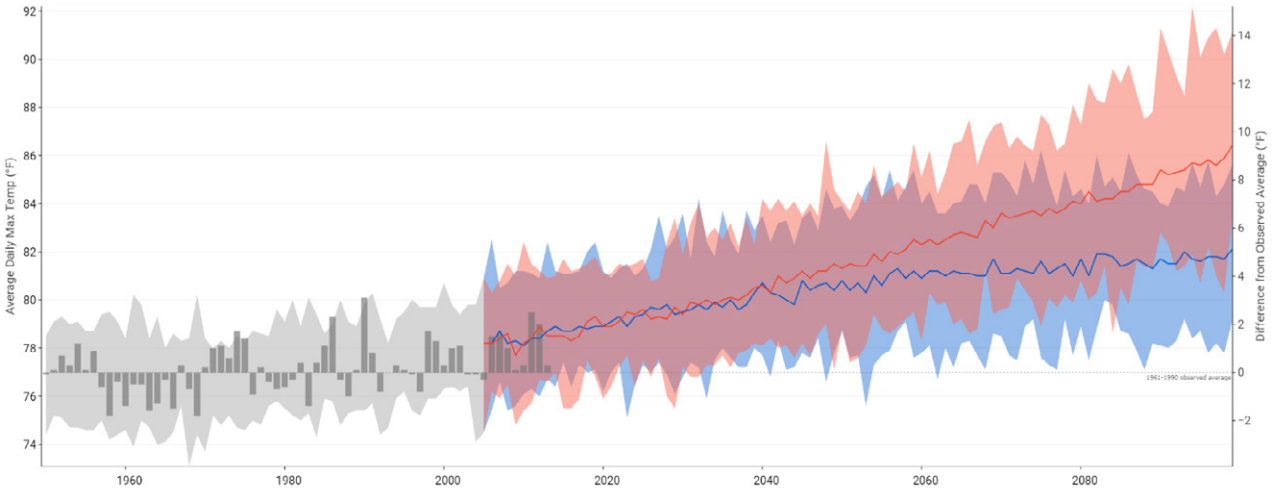


FIGURE C-2. AVERAGE DAILY MAX TEMPERATURE AT FORT PULASKI

This indicator would monitor visitor experience. This indicator and objective support the desired condition that visitors will be informed about changing conditions at Fort Pulaski, such as extreme heat. Monitoring this indicator will allow NPS staff to establish baseline data for future comparative analysis and provide better trip planning information for visitors.

Monitoring: NPS staff would check the OHSA heat monitoring phone app daily in the summer season.

Management Actions:

To help ensure a positive and safe visitor experience, park staff will take the following steps:

- Provide information on the park's website so visitors can prepare for the heat, including wearing a hat, drinking plenty of fluids, and wearing loose clothing.
- Provide cooling stations at strategic locations in the park.
- Provide educational materials on heat illness.
- Provide OHSA heat safety training for staff every year.
- Coordinate with the NPS Public Risk Management Program on best practices.
- Train staff to recognize heat-related illnesses.
- Alter operating hours, and close the park during the hottest part of the day.
- Close the terreplein during the hottest part of the day.

VISITOR CAPACITY

Overview

This section includes the visitor capacity identification for the Fort Pulaski National Monument development concept plan, prepared in accordance with the Interagency Visitor Use Management Council's Visitor Use Management Framework and Visitor Capacity Guidebook (IVUMC 2016).

Visitor capacity is defined as "the maximum amounts and types of visitor use that an area can accommodate while achieving and maintaining the desired resource conditions and visitor experiences that are consistent with the purposes for which the area was established" (IVUMC 2016). By establishing visitor capacities for areas of a park unit and implementing them with appropriate management strategies, the National Park Service can help ensure that resources are protected and that visitors have the opportunity for a range of high-quality experiences. The planning team followed the framework's process for identifying visitor capacity, including the following guidelines: (1) determine the analysis area, (2) review existing direction and knowledge, (3) identify the limiting attribute, and (4) identify visitor capacity.

The concept of the sliding scale of analysis is also a key part of the framework and guides the investment of time and resources related to identifying visitor capacity. The analysis includes

four primary components: issue uncertainty, impact risk, stakeholder involvement, and level of controversy. Fort Pulaski has a medium degree of issue uncertainty (climate change), little impact of risk due to the changes proposed under the development concept plan, and a low level of controversy. Therefore, the level of analysis is commensurate with the lower end of the sliding scale.

In addition to being an effective management tool, identifying visitor capacities is also directed by legal mandate. The National Parks and Recreation Act of 1978 requires the National Park Service to identify and implement commitments for visitor capacities for all areas of a park unit. Visitor capacities for other areas not included in this analysis could be identified in future planning, as appropriate. Further desired conditions will continue to inform and guide management of the types and levels of visitor use to sustain the quality of park resources and visitor experience consistent with the park's purpose.

Visitor capacities are management decisions based on the best available data and other factors, including professional judgment, staff experience and expertise, and lessons learned in similar parks. Visitor capacity identifications, like other management decisions, provide direction. Visitor capacities can be adjusted with appropriate environmental compliance as new information becomes available through further study, analysis, and monitoring.

Future monitoring of use levels and indicators would inform the National Park Service if visitation were at or near established capacities. Current management would continue for the implementation of the visitor capacities identified and for the management strategies described below.

Determine the Analysis Areas

Visitor capacity is identified for the following analysis areas that can be meaningfully evaluated, given sufficient information, and are directly managed by the National Park Service.

- Cockspur Island (not including the USCG station)

Review of Existing Direction and Knowledge

During this step, the planning team reviewed desired conditions, indicators and thresholds, key management issues affecting the achievement of desired conditions, and information about current visitor use levels.

To identify visitor capacity, the National Park Service must determine how many visitors are coming to the park, where they are going, and what types of recreation are occurring. The team used available visitation data and professional knowledge about the resources to inform this step.

Visitation to Cockspur Island has fluctuated from 2000 to 2023 (figure C-2). In 2023, Cockspur Island had 122,298 visitors, which was 2.8% less than 2022. Cockspur Island saw a high of 128,189 visitors in 2009 and another spike in 2019 with 127,298 annual visitors. On average, the busiest months for visitation are March through July (figure C-2). Typically, July has the most visitors to Cockspur Island; however, in 2023, March was the busiest month. An inductive loop

traffic counter is located on the exit lane from Cockspur Island, adjacent to the fee collection station. The traffic counter during normal operating hours is reduced for the number of non-recreation vehicles and buses. The reduced traffic count is multiplied by the persons-per-vehicle multiplier of 3.5.

Cockspur Island is open seven days a week from 9:00 a.m. to 5:00 p.m. except for New Years, Thanksgiving, and Christmas Day.

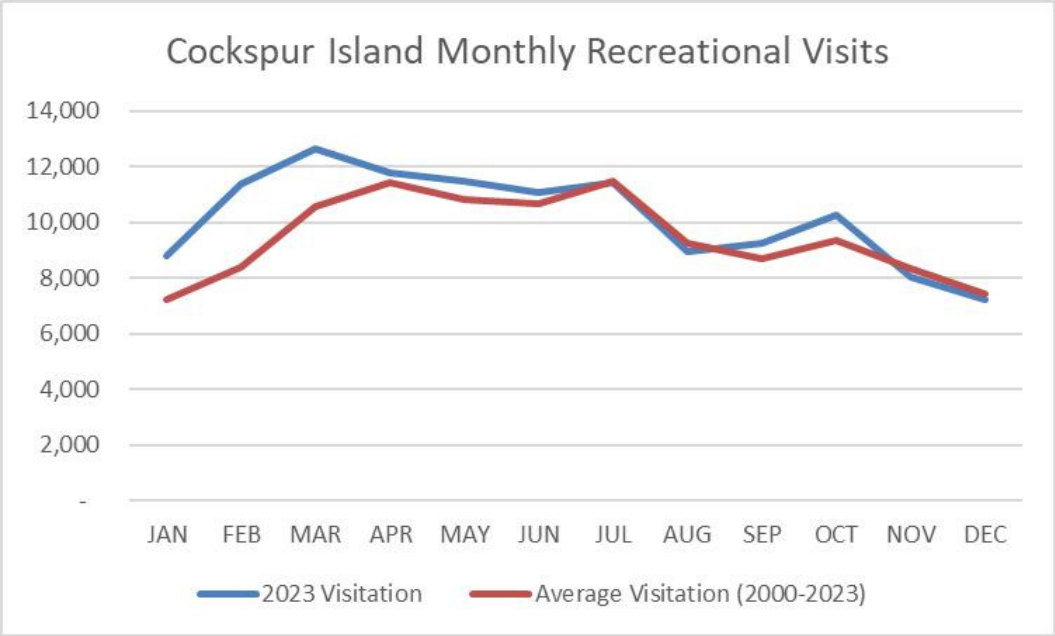


FIGURE C-3. AVERAGE VISITATION (2000–2023) AND 2023 MONTHLY RECREATIONAL VISITS TO COCKSPUR ISLAND

Identify the Limiting Attribute

This step requires identifying the limiting attributes that most constrain the analysis area's ability to accommodate visitor use. This step is important to better understand the unique dynamics of visitor use in relation to desired conditions in the analysis area and directly informs the visitor capacity identification. The primary limiting attribute that constrains the area's ability to accommodate use is the visitor experience. The park's desired conditions for visitors include having opportunities to see, hear, and feel predominantly natural environments, with the park serving as an oasis from surrounding urban life. Another desired condition is for visitors to be able to explore and find unique places throughout the park for reflection and connection.

Identify Capacity

Visitor capacity contains two parts. First is the identification of the visitor capacity (maximum amounts and types of use) and second is the identification of management strategies and actions that could be taken to implement visitor capacity to ensure that the amount of visitor use is managed to achieve and maintain desired conditions. To identify the appropriate amounts and types of use for the analysis area, the previous steps were reviewed to understand current conditions and how they compare to desired conditions for the area. Based on this review and staff expertise and experience, the planning team determined that current visitor use is not

negatively impacting desired conditions, which could allow visitation to increase from current levels. The team also recognized how the actions identified in the plan and related planning efforts affect visitor capacity. A third tier of parking and a large vehicle turnaround, improved wastewater treatment, and better vehicle circulation are all actions that better distribute and support visitation and/or make the site resilient to increased use. Given all the information, Cockspur Island can accommodate 700 people at one time while achieving and maintaining the desired conditions. Park areas outside Cockspur were not evaluated as part of this development concept plan.

As stated above, the other component of visitor capacity is identifying management strategies to ensure that use levels stay within identified capacities and that desired conditions are maintained. Currently, visitor capacities are not an issue at Fort Pulaski, and staff identified that more use could be accommodated. If desired conditions for visitor experiences are not being achieved or resources are being impacted, the following management strategies could be explored. These actions are not analyzed in this plan/environmental assessment.

Potential Management Strategies Include

- Require tour buses to obtain permits for access within the limit of NPS policy and authority.
- Require any group or individual that would use the oversized parking to schedule their visit to Fort Pulaski.
- Encourage visitors to disperse throughout the site by prioritizing interpretive product development, including self-guided tour materials, that attract people to less-visited areas.
- Manage the total number of organized groups allowed over one day.
- Offer additional interpretive resources online to allow people to experience elements of the site virtually.
- Offer additional programming, shift the program schedule, change program routes, and/or move the ranger pop-up locations to spread visitors out.
- Make greater public education efforts to encourage voluntary redistribution of visitor use to off-peak times when the site as a whole may have fewer visitors. Online and in-person resources could be developed and could be available to visitors in a variety of languages.

Future Management Strategies

This strategy would be considered if the above management strategies are ineffective and evidence shows that conditions are trending away from the desired conditions.

- Implement timed-entry reservations for visitors to manage the total number of visitors at one time to Fort Pulaski.

APPENDIX D: DRAFT FORT PULASKI NATIONAL MONUMENT WETLAND DELINEATION REPORT

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Fort Pulaski National Monument

Wetland Delineation Report



Tidal marsh landscape at sunset on Cockspur Island. NPS Photo.

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August 2024

U.S. Department of the Interior
National Park Service
Interior Region 2, Science and Natural Resource Management
Atlanta, GA

Abstract

On July 23–24, 2024, wetland ecologist Byron Tsang (NPS Interior Region 2 [IR2] Science and Natural Resources Management Division) conducted a wetland delineation at several locations around Cockspur Island at Fort Pulaski National Monument (FOPU) Savannah, Georgia. He was assisted in the field by FOPU Chief of Resource Management Laura Seifert and by IR2 Environmental Protection Specialist Sabrina Henry. This work was conducted in support of project planning and environmental compliance efforts for the FOPU Development Concept Plan (DCP) currently in progress with support from Denver Services Center (DSC). In anticipation of regulatory compliance documentation for construction projects proposed in the DCP, a jurisdictional wetland delineation is required. Aquatic resource compliance for all NPS undertakings is governed by Executive Order (EO) 11990 and Director's Order (DO) #77–1: Wetland Protection for NPS wetlands (including streams and rivers), by EO 11988 and DO #77–2: Floodplain Management for NPS floodplains, and by Section 404 of the Clean Water Act (33 U.S.C. 1344) for Waters of the United States. Methods for delineation of NPS wetlands are defined in NPS Procedural Manual #77–1: Wetland Protection. Methods for delineation of NPS floodplains are defined in NPS Procedural Manual #77–2: Floodplain Management. Methods for delineation of Waters of the U.S. are defined in U.S. Army Corps of Engineers (USACE) "Corps of Engineers Wetlands Delineation Manual" (1987), and USACE "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0)" (2010). Survey site descriptions, resource descriptions and functional assessments, and technical delineation data are presented herein.

Keywords: Wetland, Floodplain, Wetland Delineation, Resource Assessment.

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Site Description

Cockspur Island is located within Fort Pulaski National Monument at the mouth of the Savannah River at approximate coordinates 32.027163° N, 80.892728° W roughly 2 miles west of Tybee Island, and 12 miles east of Savannah, Georgia. The island has a long history of strategic military importance and has been substantially altered through decades of dredge spoil placement to build up the island's terrain and defensive structures associated with Fort Pulaski. Although most of the island is comprised of made land, the landscape and vegetation are well established and comparable to adjacent natural islands. Soils are predominantly sandy and well drained, typical of coastal barrier islands on the Georgia coast. Naturally occurring coastal ecosystems include estuarine tidal marsh and maritime forests. Managed landscapes on the island include mowed turf lawns as well as impounded marsh wetlands that form the historic ditch and dike system surrounding the fort which are distinct from the coastal estuary marshes outside of the dike impoundment. Except for a small topographic feature on the west end of the island, the entirely of Cockspur Island falls within the Federal Emergency Management Agency (FEMA) Flood Hazard Zone VE, which indicates coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. Five distinct study sites were identified on Cockspur Island by FOPU staff and DSC project planners for inclusion in this wetland survey (*see* Table 1. Summary of wetland study site locations on Cockspur Island, and Attachment 1. Wetland Resource Assessment Sites Map).

Table 1. Summary of wetland study site locations on Cockspur Island

STUDY SITE	AREA (acres)	LATITUDE	LONGITUDE
New Facility Building	10.17	32.032945 °	-80.905548 °
Picnic Area	1.36	32.030664 °	-80.900131 °
Park Entrance	1.42	32.027637 °	-80.895415 °
Old Road	1.72	32.028440 °	-80.893898 °
Visitor Center & Parking	4.19	32.027799 °	-80.892085 °

New Facility Building

The proposed location for a new facilities building is a relatively high elevation topographic feature approximately 1,500 feet west of the FOPU Headquarters building. The site currently contains RV pads for park volunteers and staff. This study site includes the proposed building location as well as adjacent grounds which may be used for construction access and staging. This location also includes an existing fenced enclosure where clean fill material from recent ditch maintenance excavations are being stored for park use. Beyond these RV pads and dredge spoil enclosure, most of this site contains maritime forest landscape. The survey boundary at the New Facility Building study site is approximately 10.2 acres.

Picnic Area

The Picnic Area study location includes the existing pine forested picnic area and associated parking area. This study site also includes the currently closed comfort station to the south but does not

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include the existing picnic pavilion structure west of the parking area. The survey boundary at the Picnic Area is approximately 1.4 acres.

Park Entrance

Proposed design alternatives for a new park entrance facility are being considered along Fort Pulaski Road beginning approximately 1,000 feet north of Cockspur Island Bridge and ending at the "Y" intersection with Cockspur Island Road. The entirely of this study location is inside of the historic ditch and dike impoundment with the park road itself built atop a portion of the dike. The roadway and associated fill embankment are elevated above the surrounding terrain which is predominantly impounded scrub-shrub marsh. At the north end of this site, portions of the landscape are maintained as manicured turf lawn. The survey boundary at the Park Entrance study area is approximately 1.4 acres.

Old Road

This study site runs east-west from the "Y" intersection to the northern edge of the existing public parking area at the FOPU Visitor Center. This corridor follows the original roadway serving the fort until the road was relocated in the 1960 as part of the Mission 66 construction of the Visitor Center (VC). Approximately half of this study site is maintained turf lawn. Parallel to this lawn is a historic ditch, and north of the ditch the landscape is characterized by low-stature wet meadow with patches of scrub-shrub wetland that transition northward into maritime forest. The survey boundary at the Old Road study area is approximately 1.7 acres.

Visitor Center and Parking

The FOPU DCP will include proposals to construct additional parking capacity and improve traffic flows around the fort and VC, and to improve accessibility throughout these facilities. This study site includes the VC and parking lot as well as additional staging and access area east of the existing parking lot. This study site is comprised of paved parking lots, roadway, and sidewalk facilities, unpaved pedestrian and staff access trails, and adjacent managed turf lawns. The survey boundary at the VC and Parking study area is approximately 4.2 acres.

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Wetland Delineation Results

Six distinct wetland resources were delineated across the five study areas, including five palustrine wetlands and one riverine wetland (*see* Table 2. Summary of delineated wetland resources, Attachments 5 and 6. Wetland Delineation Maps, and Attachment 7. Wetland Determination Data Forms).

Table 2. Summary of delineated wetland resources

RESOURCE	COWARDIN CLASS	AREA (acre)	AREA (sq ft)	WOTUS STATUS?
WL 1	PFO4	0.60	26,147	Yes
WL 2	PSS1Jdh	0.51	22,121	Yes
WL 3	PFO3h	0.03	1,165	Assumed
STR 4	R4SB7x	0.10	4,448	Assumed
WL 5	PEM1h	1.03	44,742	Assumed
WL 6	PSS1Jdh	0.02	977	Yes

WL 1

Wetland 1 (WL 1) is a palustrine forested wetland with dominant needle-leaved evergreen vegetation (Cowardin class PFO4). A hydrologic regime could not be conclusively determined at the time of survey due to excessive soil moisture from recent rainstorms. However, available evidence suggests it to be non-tidal and driven primarily periodic seasonal saturation by groundwater. Vegetation was characterized by a canopy of Eastern red cedar (*Juniperus virginiana*) and cabbage palm (*Sabal palmetto*) with sparse understory of Southern wax myrtle (*Myrica cerifera*), salt bush (*Baccharis halimifolia*), and sea oxeye daisy (*Borrichia frutescens*). Beyond the survey boundary to the south, this maritime forest wetland transitions to scrub-shrub marsh fringe and then to emergent salt marsh wetland conditions. This wetland is a paragraph (a)(4) jurisdictional Water of the US (WOTUS) as an adjacent wetland with a direct surface connection to the South Channel Savannah River. Despite occurring on reclaimed land from historic dredge spoil placement, this wetland appears to be mature, fully functional, and equivalent to naturally occurring comparable wetlands with no evidence of disturbance or hydrologic alternations and no significant invasive species presence. WL 1 is located in the New Facility Building study site and occupies 0.6 acre (26,147 sq. ft) within the survey boundary.

WL 2

Wetland 2 (WL 2) is a partially drained or ditched and impounded palustrine scrub-shrub wetland with dominant broad-leaved deciduous vegetation that is subject to an intermittently flooded hydrologic regime (Cowardin class PSS1Jdh). This wetland is inside the historic ditch and dike system of Fort Pulaski and its hydrology can be actively manipulated through control of a tide gate. Vegetation was characterized by a shrub canopy of salt bush and a dense herbaceous understory dominated by bahia grass (*Paspalum notatum*) along the road shoulder and by salt grass (*Distichlis spicata*) elsewhere. Beyond the survey boundary to the east numerous standing dead eastern red cedars remain from a former forested canopy that died back attributed to storm damage and

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hydrologic changes following Hurricanes Harvey (2016) and Irma (2017). This wetland is a paragraph (a)(4) jurisdictional WOTUS as an adjacent wetland with a direct surface connection to the South Channel Savannah River via the culvert and tide gate through the dike impoundment. This wetland is significantly impaired due to prior storm surge inundation and subsequent hypersaline conditions which are assumed to have resulted from evaporative concentration and other effects related to damaged culverts and water control structures. In addition to killing the cedar canopy, these conditions promoted widespread invasive plant growth and long-term changes in the vegetation structure throughout this wetland. The ditch, culvert, and tide gate have since been repaired, and this wetland is now able to drain more efficiently. Ongoing management actions to promote tidal flushing may improve conditions further. WL 2 is located in the Park Entrance study site and occupies 0.5 acre (22,121 sq. ft) within the survey boundary.

WL 3

Wetland 3 (WL 3) is an impounded palustrine forested wetland with dominant broad-leaved evergreen vegetation (Cowardin class PFO3h). This wetland is inside the historic ditch and dike system of Fort Pulaski and its hydrology can be actively manipulated through control of a tide gate. However, the water control structures and ditches on the north side of the island are not currently functional, resulting in impairment of this hydrologic system due to stagnation. Despite recent rainstorms resulting in excess soil moisture, available evidence at time of survey suggests this wetland to be non-tidal and driven primarily periodic seasonal saturation by groundwater. Vegetation was characterized by a canopy of cabbage palm with a dense shrub understory of yaupon holly (*Ilex vomitoria*). Although a direct surface connection could not be identified due to the non-functional control structure, this wetland is assumed to be a paragraph (a)(4) jurisdictional WOTUS as an adjacent wetland with a direct surface connection to the Savannah River via the culvert and tide gate through the dike impoundment. This wetland appears to be somewhat impaired by hydrologic disturbances and excessive woody shrub growth but nearly all vegetation is comprised of habitat-appropriate native species. WL 3 is located in the Visitor Center and Parking study site and occupies 0.03 acre (1,165 sq. ft) within the survey boundary.

STR 4

Stream 4 (STR4) is an artificially excavated intermittent riverine wetland ditch with a vegetated sandy silt streambed (Cowardin class R4SB7x). STR4 is not identified on the USGS National Hydrography Dataset. The stream is stagnant with no apparent outflow but ostensibly flows east and drains palustrine wetlands WL 3 and WL 5 to ground water. Artificial ditches are commonly excluded from WOTUS under 40 CFR 120.2 paragraph (b)(3). However, based on the presence of relatively permanent base flow and contiguous surface connections to adjacent wetlands WL 3 and WL 5, this stream is assumed to be a paragraph (a)(4) jurisdictional WOTUS as an adjacent wetland with a direct surface connection to the Savannah River via the culvert and tide gate through the dike impoundment. At the time of survey, this stream appeared fully functional with no apparent water quality defects. STR 4 is located in the Old Road study site and occupies 1.03 acre (44,742 sq. ft) within the survey boundary.

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WL 5

Wetland 5 (WL 5) is an impounded palustrine emergent wetland with persistent vegetative cover (Cowardin class PEM1h). This wetland is inside the historic ditch and dike system of Fort Pulaski and its hydrology can be actively manipulated through control of a tide gate. However, the water control structures and ditches on the north side of the island are not currently functional, resulting in impairment of this hydrologic system due to stagnation. Despite recent rainstorms resulting in excess soil moisture, available evidence at time of survey suggests this wetland to be non-tidal and driven primarily periodic seasonal saturation by groundwater. At the wetland sample location, vegetation was complicated by the presence of maintained Zoysia turf grass (*Zoysia matrella*) along the roadway. However, this lawn transitions quickly to a monoculture of low-stature salt grass within a few feet from the road embankment. To the east along STR 4, WL 5 vegetation is a more diverse array of typical emergent wetland grasses and forbs common throughout the region. Although a direct surface connection could not be identified due to the non-functional control structure, this wetland is assumed to be a paragraph (a)(4) jurisdictional WOTUS as an adjacent wetland with a direct surface connection to the Savannah River via the culvert and tide gate through the dike impoundment. This wetland appears to be somewhat impaired by hydrologic alteration and plant community changes associated with lawn maintenance. Outside of mowed areas, nearly all vegetation is comprised of habitat-appropriate native species with no observed invasive species presence. WL 5 is located in the Old Road study site and occupies 0.03 acre (1,165 sq. ft) within the survey boundary.

WL 6

Wetland 6 (WL 6) is a partially drained or ditched and impounded palustrine scrub-shrub wetland with dominant broad-leaved deciduous vegetation that is subject to an intermittently flooded hydrologic regime (Cowardin class PSS1Jdh). This wetland is inside the historic ditch and dike system of Fort Pulaski and its hydrology can be actively manipulated through control of a tide gate. Vegetation was characterized by a shrub canopy of salt bush with an herbaceous understory of cordgrass (*Spartina alterniflora*) and pennywort (*Hydrocotyle umbellata*). This wetland is contiguous with WL 2 beyond the survey boundary and features the same standing dead eastern red cedar remnant of former forested canopy. This wetland is a paragraph (a)(4) jurisdictional WOTUS as an adjacent wetland with a direct surface connection to the South Channel Savannah River via the culvert and tide gate through the dike impoundment. This wetland is significantly impaired due to prior storm surge inundation and subsequent hypersaline conditions as previously described with WL 2. Ongoing management actions to promote tidal flushing may improve conditions further. WL 6 is located in the Visitor Center and Parking study site and occupies 0.02 acre (977 sq. ft) within the survey boundary.

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Project Compliance Considerations

New construction projects proposed in the Development Concept Plan have the potential to adversely affect wetlands and floodplains within the project area and may be subject to NPS Director's Order 77-1 compliance considerations. Based on the location of wetlands within the study area, complete avoidance of adverse impacts may be feasible. If not avoidable, wetland impacts associated with new construction would require a Statement of Findings and compensatory mitigation. In general, maintenance of existing facilities in wetlands is an excepted action under PM 77-1 §4.2.1.7: Maintenance, repair, or renovation (but not full reconstruction or expansion) of currently serviceable facilities or structures. Under this exception, minor adverse wetland impacts are allowed, not to exceed 0.1 acre (4,356 square feet). This minor impact limit allows for design changes and construction access as required for the new/repaired facility. This exception would apply to alterations to existing trails and sidewalks but would NOT apply to the proposed widening of the road at the park entrance, nor to proposed construction of a third parking bay at the Fort and VC complex. Regardless of the applicability of an excepted action, potential wetland impacts must still be avoided or minimized to the greatest practicable extent. Note that mitigation under NPS wetland protection policy is separate from and in addition to any compensatory mitigation required by other regulatory authorities such as Section 404 permitting.

Discharge of fill into Waters of the US is regulated under Section 404 of the Clean Water Act. Actions which would result in fill of the streams and wetlands described above would require a Section 404 permit prior to construction. For streamlined permit processing and procedures, use of the US Army Corps of Engineers Nationwide Permit program is encouraged wherever feasible. Additional regional requirements specific to the Savannah Regulatory District may also apply. For most projects using Nationwide Permits, a pre-construction notification would be required, and the district engineer may require mitigation to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects.

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U.S. Geological Survey. USGS 3D Elevation Program Digital Elevation Model.

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Attachments

Included with this resource delineation, please see the following attachments:

Attachment 1. Wetland Resource Assessment Sites Map
Attachment 2. FEMA NFHL (Floodplain) Map
Attachment 3. NRCS Soils Map
Attachment 4. National Wetland Inventory Map
Attachment 5. Wetland Delineation Overview Map
Attachment 6. Wetland Delineation Detail Maps
- 6.1. New Facility Detail
- 6.2. Picnic Area Detail
- 6.3. Entrance Detail
- 6.4. Old Road Detail
- 6.5. VC & Parking Detail

Attachment 7. Wetland Determination Data Forms
- 7.1. WL 1 – Wet
- 7.2. WL 1 – Upl
- 7.3. WL 2 – Wet
- 7.4. WL 2 – Upl
- 7.5. WL 3 – Wet
- 7.6. WL 3 – Upl
- 7.7. STR 4
- 7.8. WL 5 – Wet
- 7.9. WL 5 – Upl
- 7.10. WL 6 – Wet
- 7.11. WL 6 – Upl

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2024 FOPU Development Concept Plan

Wetland Resource Assessment Sites

Fort Pulaski National Monument
National Park Service
U.S. Department of the Interior



North

0 0.5 Kilometers

0 0.5 Miles

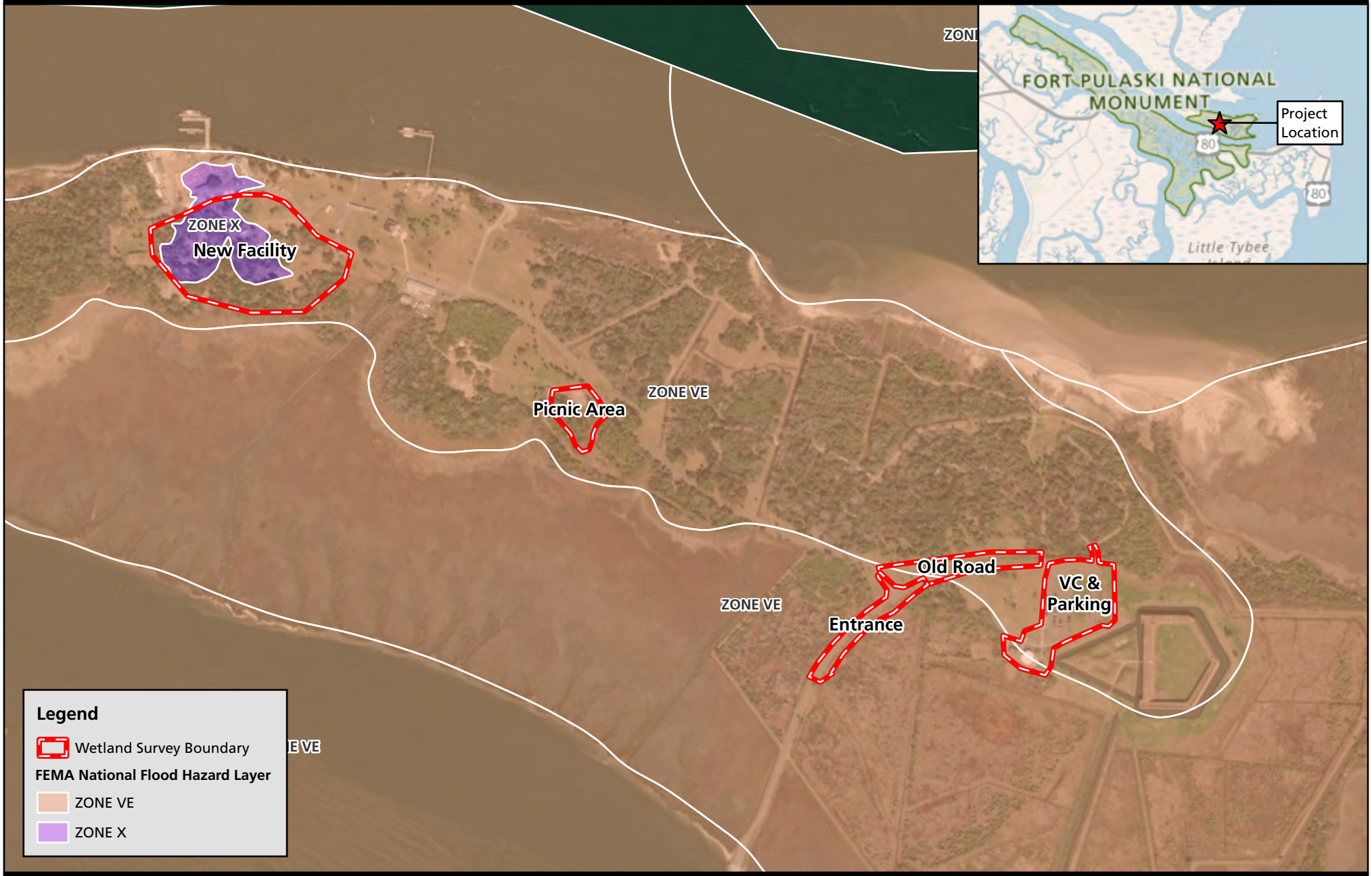
July 2024

Data Sources: ESRI Imagery, NPS Park Data
Produced by Byron Tsang, Regional Wetland Ecologist, NPS SER SNRMD

2024 FOPU Development Concept Plan

Federal Emergency Management Agency, National Flood Hazard Layer

Fort Pulaski National Monument
National Park Service
U.S. Department of the Interior



July 2024

Data Sources: ESRI Imagery, NPS Park Data
Produced by Byron Tsang, Regional Wetland Ecologist, NPS SER SNRMD

2024 FOPU Development Concept Plan

Natural Resources Conservation Service Soils

Fort Pulaski National Monument
National Park Service
U.S. Department of the Interior



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Produced by Byron Tsang, Regional Wetland Ecologist, NPS SER SNRMD

2024 FOPU Development Concept Plan

National Wetland Inventory

Fort Pulaski National Monument
National Park Service
U.S. Department of the Interior



E1UBL
E2EM1/USN
New Facility
E2EM1P
E2EM1N
E1UBLx
E1UBLx
E2EM1N
E1UBLx
R2UBHx
E2USP
E2EM1P
E2EM1P
Picnic Area
R2UBHx
E2EM1P
R2UBHx
E2EM1N
E1UBLx
E2EM1N
E2USP
E2USP
R2UBHx
E2USP
E2EM1N
E2EM1N
Old Road
VC &
Parking
E2EM1N
Entrance
R2UBH
E2EM1N
R2UBH
R2UBH
E1UBLx
PUBHx
R2UBH
PEM1A
PSS4/FO1A
PUBHx
PEM1A
R2UBHx
E2EM1N
R2UBHx
R2UBHx
E2EM1N
E2EM1P
E2EM1P
R2UBHx

Legend

- Wetland Survey Boundary

National Wetland Inventory

- Estuarine
- Riverine
- Palustrine

North

0 0.5 Kilometers

0 0.5 Miles

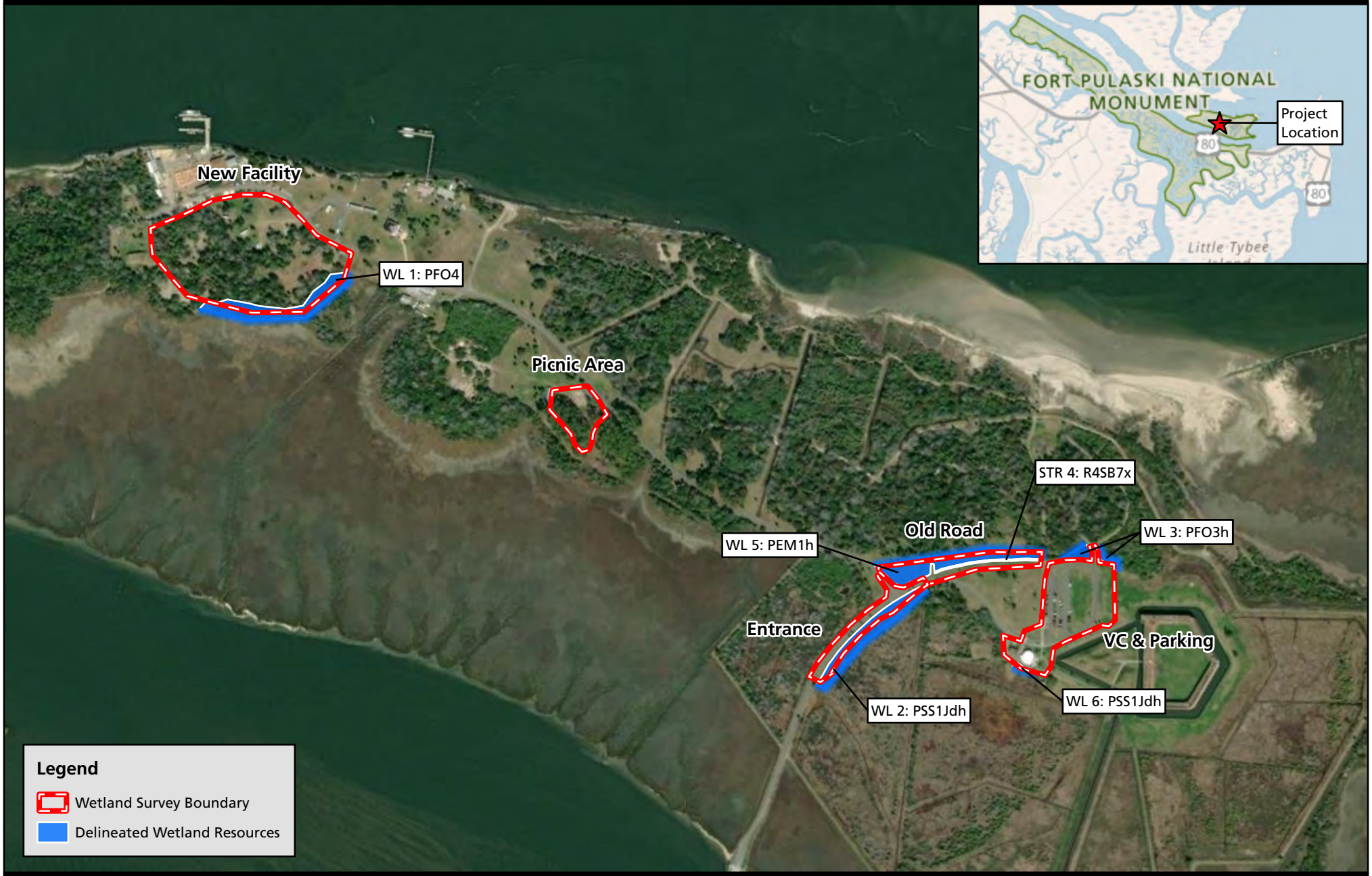
July 2024

Data Sources: ESRI Imagery, NPS Park Data
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2024 FOPU Development Concept Plan

Wetland Delineation – Overview

Fort Pulaski National Monument
National Park Service
U.S. Department of the Interior



July 2024

Data Sources: ESRI Imagery, NPS Park Data
Produced by Byron Tsang, Regional Wetland Ecologist, NPS SER SNRMD

2024 FOPU Development Concept Plan

Wetland Delineation – New Facility Detail (Sheet 1 of 5)

Fort Pulaski National Monument
National Park Service
U.S. Department of the Interior



July 2024

Data Sources: ESRI Imagery, NPS Park Data
Produced by Byron Tsang, Regional Wetland Ecologist, NPS SER SNRMD

2024 FOPU Development Concept Plan

Wetland Delineation – Picnic Area Detail (Sheet 2 of 5)

Fort Pulaski National Monument
National Park Service
U.S. Department of the Interior



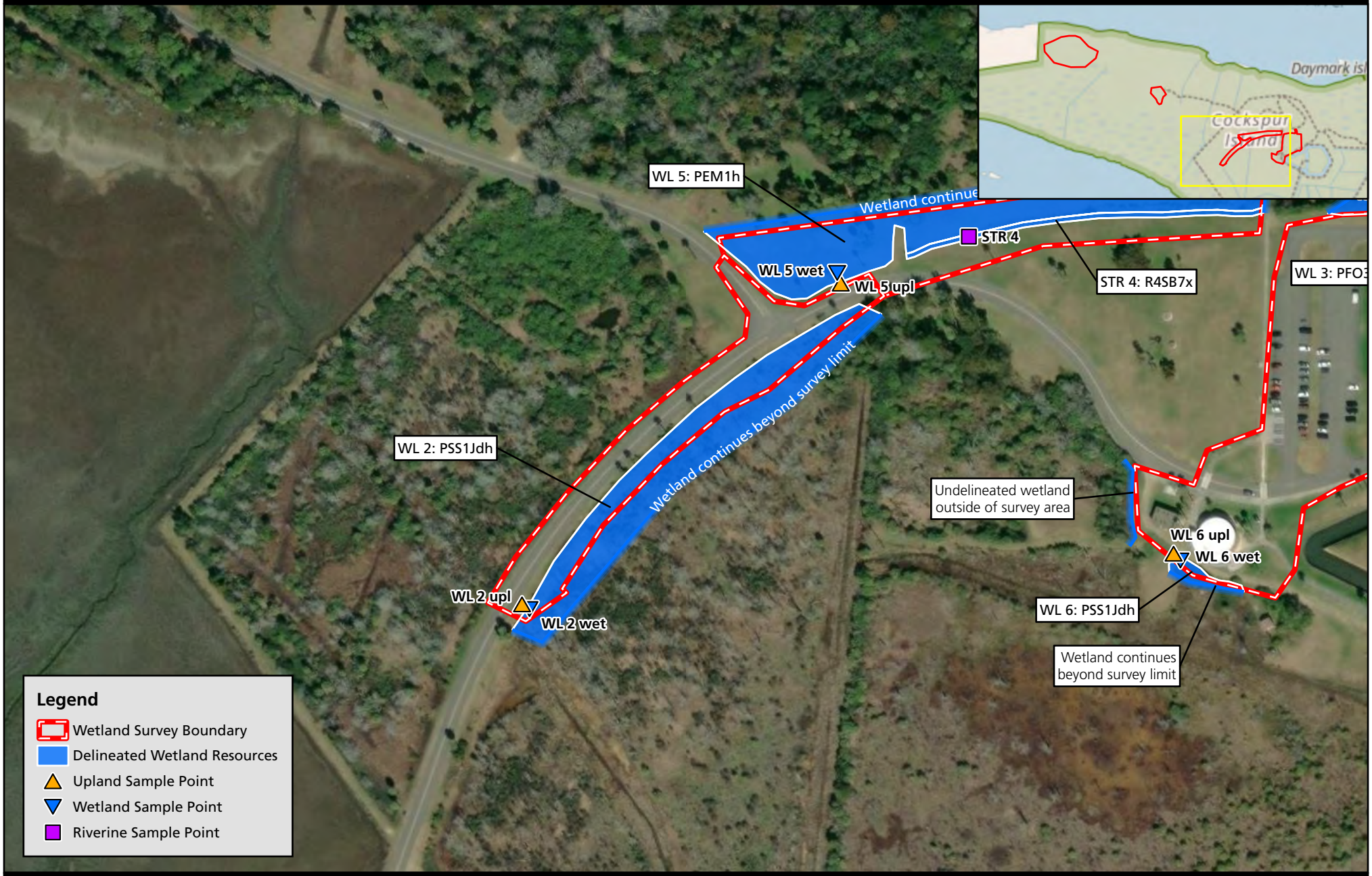
July 2024

Data Sources: ESRI Imagery, NPS Park Data
Produced by Byron Tsang, Regional Wetland Ecologist, NPS SER SNRMD

2024 FOPU Development Concept Plan

Wetland Delineation – Entrance Detail (Sheet 3 of 5)

Fort Pulaski National Monument
National Park Service
U.S. Department of the Interior



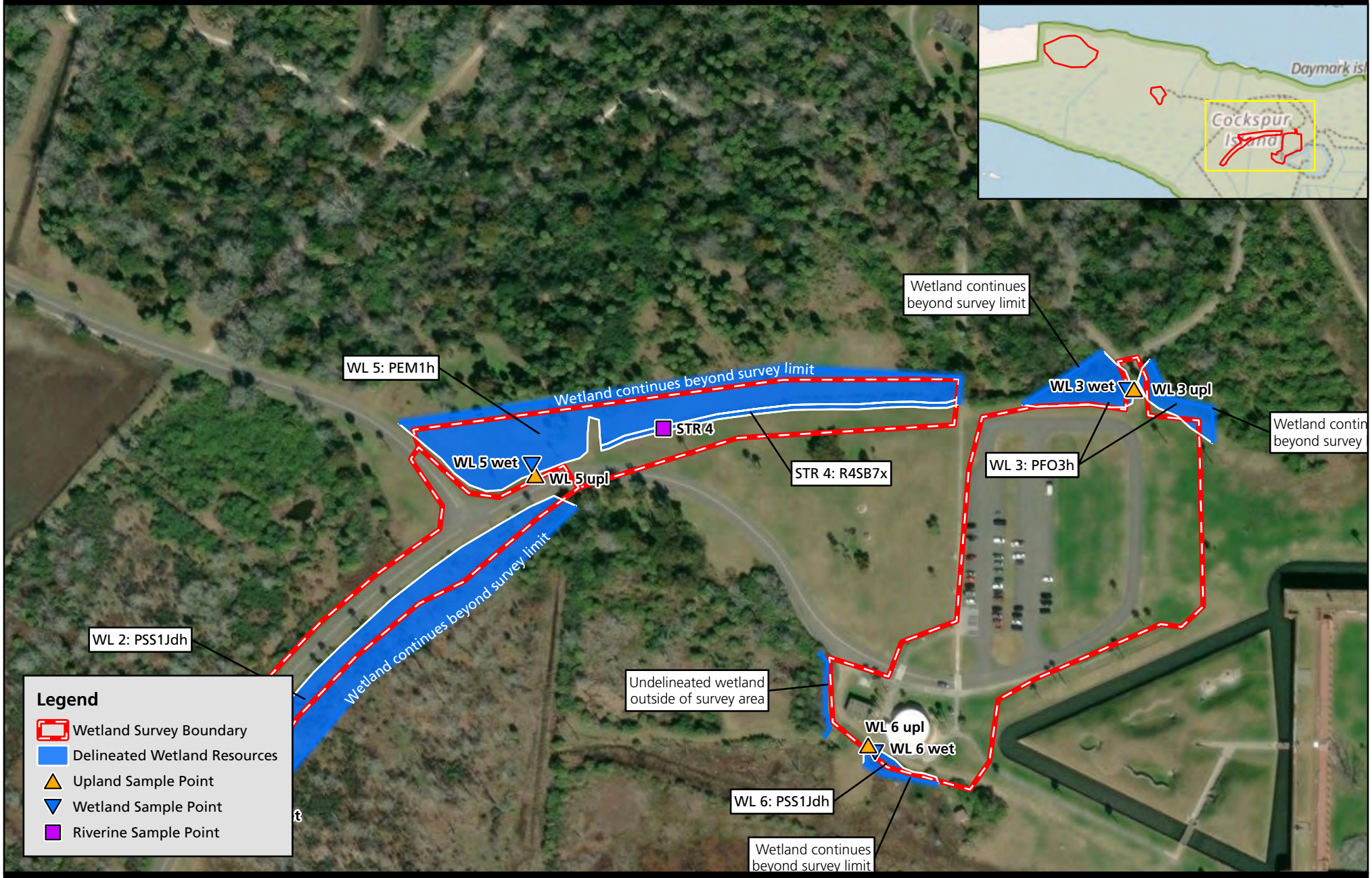
July 2024

Data Sources: ESRI Imagery, NPS Park Data
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2024 FOPU Development Concept Plan

Wetland Delineation – Old Road Detail (Sheet 4 of 5)

Fort Pulaski National Monument
National Park Service
U.S. Department of the Interior



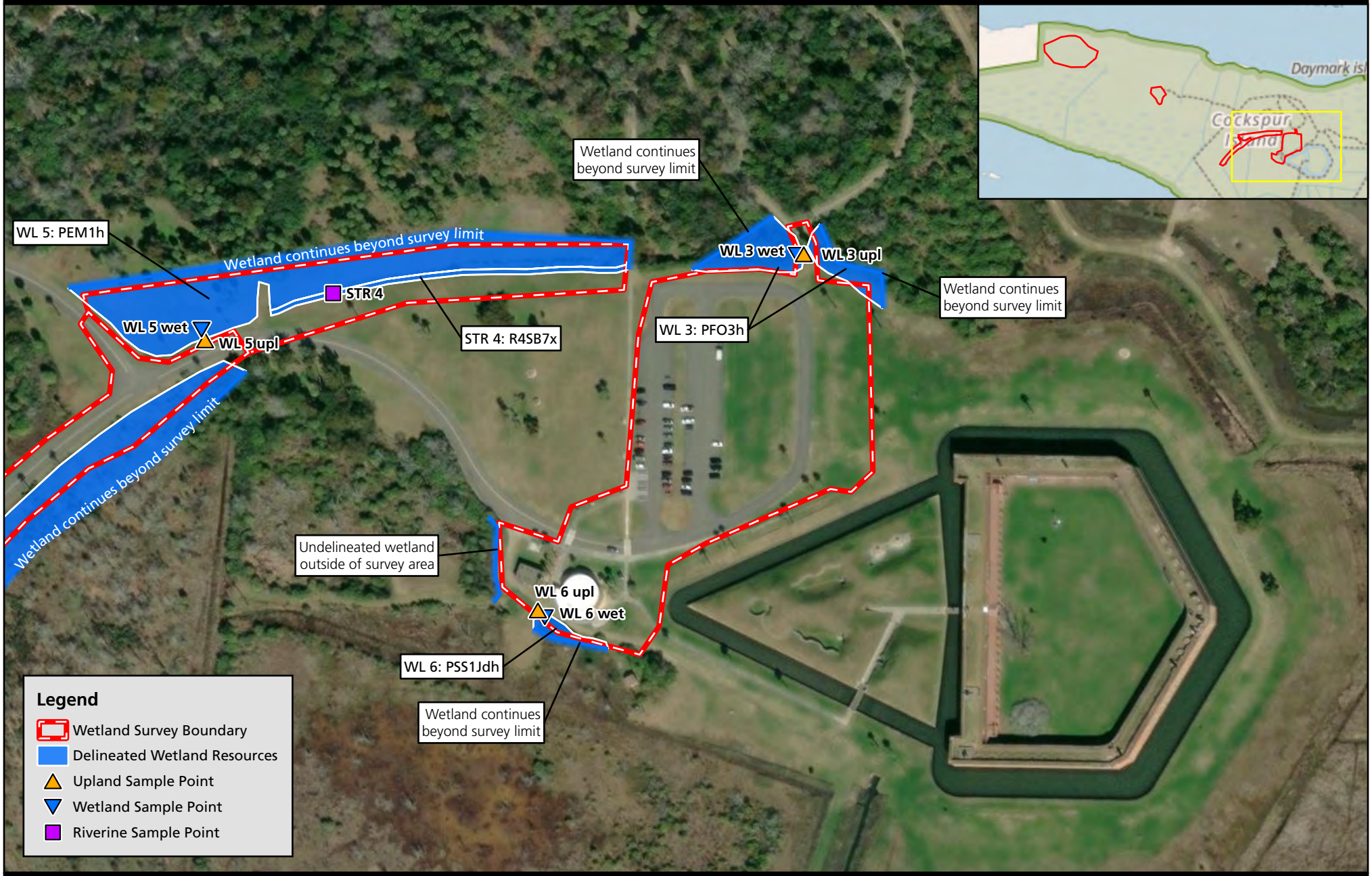
July 2024

Data Sources: ESRI Imagery, NPS Park Data
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2024 FOPU Development Concept Plan

Wetland Delineation – VC & Parking Detail (Sheet 5 of 5)

Fort Pulaski National Monument
National Park Service
U.S. Department of the Interior



July 2024

Data Sources: ESRI Imagery, NPS Park Data
Produced by Byron Tsang, Regional Wetland Ecologist, NPS SER SNRMD

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region
See ERDC/EL TR-10-20; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 04/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Fort Pulaski National Monument City/County: Savannah (Chatham County) Sampling Date: 07/23/2024

Applicant/Owner: National Park Service State: GA Sampling Point: WL 1 wet

Investigator(s): B Tsang; L Seifert; S Henry Section, Township, Range: N/A ☑ Wet ☐ Upl

Landform (hillslope, terrace, etc.): Marsh fringe Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR or MLRA): LRR T; MLRA 153B Lat: 32.03229° Long: -80.90594° Datum: WGS 1984

Soil Map Unit Name: Mae - Made land NWI classification: none

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ 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 ☐	**Is the Sampled Area within a Wetland?**	**Yes** ☑	**No** ☐
Hydric Soil Present?	Yes ☑	No ☐			
Wetland Hydrology Present?	Yes ☑	No ☐			

Remarks:
COWARDIN CLASS: PFO4

Field ID: WL1

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)
- ☐ Marl Deposits (B15) (**LRR U**)
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (**LRR T, U**)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? Yes ☑ No ☐ Depth (inches): 10
(includes capillary fringe)

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WL 1 wet: Wet

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Juniperus virginiana*	20	yes	FACU
2. *Sabal palmetto*	15	yes	FAC
3.			
4.			
5.			
6.			
	35	=Total Cover	
50% of total cover: 17.5	20% of total cover: 7		

Sapling Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0	=Total Cover	
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 15 ft)			
1. *Baccharis halimifolia*	25	yes	FAC
2. *Baccharis angustifolia*	25	yes	FACW
3.			
4.			
5.			
6.			
	50	=Total Cover	
50% of total cover: 25	20% of total cover: 10		

Herb Stratum (Plot size: 5 ft)			
1. *Borrichia frutescens*	100	yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	=Total Cover	
50% of total cover: 50	20% of total cover: 20		

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0	=Total Cover	
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL Species	100	x 1 =	100
FACW Species	25	x 2 =	50
FAC Species	40	x 3 =	120
FACU Species	20	x 4 =	80
UPL Species	0	x 5 =	0
Columns Totals:	185 (A)		350 (B)

Prevalence Index = B/A = 1.89

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is > 50%
- ☑ 3 - Prevalence Index is ≤ 3.0[1]
- ☐ 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** ☐

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

SOIL Sampling Point: WL 1 wet: Wet

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (Moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0–1	10YR 2/1	100			MS	M	Loamy Sand	
1–10	10YR 5/2	95	5YR 4/4	5	RM	PL	Sand	
10–24	10YR 6/1	95	5YR 4/4	5	RM	PL	Sand	Saturated @ 10"

[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)
- ☐ Organic Bodies (A6) (**LRR P, T, U**)
- ☐ 5 cm Mucky Mineral (A7) (**LRR P, T,** U)
- ☐ Muck Presence (A8) (**LRR U**)
- ☐ 1 cm Muck (A9) (**LRR P, T**)
- ☑ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) (**MLRA 150A**)
- ☐ Sandy Mucky Mineral (S1) (**LRR O, S**)
- ☐ Sandy Gleyed Matrix (S4)
- ☑ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR P, S, T, U**)
- ☐ Polyvalue Below Surface (S8) (**LRR S, T, U**)
- ☐ Thin Dark Surface (S9) (**LRR S, T, U**)
- ☐ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- ☐ Loamy Mucky Mineral (F1) (**LRR O**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) (LRR U)
- ☐ Depleted Ochric (F11) (**MLRA 151**)
- ☐ Iron-Manganese Masses (F12) (**LRR O, P, T**)
- ☐ Umbric Surface (F13) (**LRR P, T, U**)
- ☐ Delta Ochric (F17) (**MLRA 151**)
- ☐ Reduced Vertic (F18) (**MLRA 150A, 150B**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 149A, 153C, 153D**)
- ☐ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR O**)
- ☐ 2 cm Muck (A10) (**MLRA 147**)
- ☐ Coast Prairie Redox (A16) **(outside MLRA 150A)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) (**LRR P, T**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 153B**)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12) **(outside MLRA 138, 152A in FL, 154)**
- ☐ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- ☐ 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** ☐

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region
See ERDC/EL TR-10-20; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 04/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Fort Pulaski National Monument City/County: Savannah (Chatham County) Sampling Date: 07/23/2024

Applicant/Owner: National Park Service State: GA Sampling Point: WL 1 upl

Investigator(s): B Tsang; L Seifert; S Henry Section, Township, Range: N/A ☐ Wet ☑ Upl

Landform (hillslope, terrace, etc.): Flat woods Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR or MLRA): LRR T; MLRA 153B Lat: 32.03239° Long: -80.90594° Datum: WGS 1984

Soil Map Unit Name: Mae - Made land NWI classification: none

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ 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 ☑	**Is the Sampled Area within a Wetland?**	**Yes** ☐	**No** ☑
Hydric Soil Present?	Yes ☐	No ☑			
Wetland Hydrology Present?	Yes ☐	No ☑			

Remarks:

Field ID: UP1

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)
- ☐ Marl Deposits (B15) (**LRR U**)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (**LRR T, U**)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches):		
Water Table Present?	Yes ☐	No ☑	Depth (inches):		
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches):	12	

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WL 1 upl: Upl

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Sabal palmetto*	50	yes	FAC
2. *Juniperus virginiana*	20	yes	FACU
3.			
4.			
5.			
6.			
	70	=Total Cover	
50% of total cover: 35		20% of total cover: 14	

Sapling Stratum (Plot size: 15 ft)			
1. *Sabal palmetto*	5	yes	FAC
2.			
3.			
4.			
5.			
6.			
	5	=Total Cover	
50% of total cover: 2.5		20% of total cover: 1	

Shrub Stratum (Plot size: 15 ft)			
1. *Ilex vomitoria*	50	yes	FAC
2.			
3.			
4.			
5.			
6.			
	50	=Total Cover	
50% of total cover: 25		20% of total cover: 10	

Herb Stratum (Plot size: 5 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0	=Total Cover	
50% of total cover: 0		20% of total cover: 0	

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0	=Total Cover	
50% of total cover: 0		20% of total cover: 0	

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL Species	0	x 1 =	0
FACW Species	0	x 2 =	0
FAC Species	105	x 3 =	315
FACU Species	20	x 4 =	80
UPL Species	0	x 5 =	0
Columns Totals:	125 (A)		395 (B)

Prevalence Index = B/A = 3.16

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is > 50%
- ☐ 3 - Prevalence Index is ≤ 3.0[1]
- ☐ 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** ☑

Remarks: (Include photo numbers here or on a separate sheet.)
presence of FAC tree and shrub species (Sabal palmetto and Ilex. vomitoria) are not strong indicators of WL conditions at FOPU. These species routinely occur in coastal upland forests and back dune habitat in this area.

SOIL Sampling Point: WL 1 upl: Upl

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (Moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0–2	10YR 4/1	100					Sand	
2–12	10YR 5/3	100					Sand	
12–24	10YR 5/2	98	7.5YR 4/3	2	RM	PL	Sand	Saturated @12"

[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)
- ☐ Organic Bodies (A6) (**LRR P, T, U**)
- ☐ 5 cm Mucky Mineral (A7) (**LRR P, T,** U)
- ☐ Muck Presence (A8) (**LRR U**)
- ☐ 1 cm Muck (A9) (**LRR P, T**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) (**MLRA 150A**)
- ☐ Sandy Mucky Mineral (S1) (**LRR O, S**)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR P, S, T, U**)
- ☐ Polyvalue Below Surface (S8) (**LRR S, T, U**)
- ☐ Thin Dark Surface (S9) (**LRR S, T, U**)
- ☐ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- ☐ Loamy Mucky Mineral (F1) (**LRR O**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) (LRR U)
- ☐ Depleted Ochric (F11) (**MLRA 151**)
- ☐ Iron-Manganese Masses (F12) (**LRR O, P, T**)
- ☐ Umbric Surface (F13) (**LRR P, T, U**)
- ☐ Delta Ochric (F17) (**MLRA 151**)
- ☐ Reduced Vertic (F18) (**MLRA 150A, 150B**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 149A, 153C, 153D**)
- ☐ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR O**)
- ☐ 2 cm Muck (A10) (**MLRA 147**)
- ☐ Coast Prairie Redox (A16) **(outside MLRA 150A)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) (**LRR P, T**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 153B**)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12) **(outside MLRA 138, 152A in FL, 154)**
- ☐ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- ☐ 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** ☑

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region
See ERDC/EL TR-10-20; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 04/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Fort Pulaski National Monument City/County: Savannah (Chatham County) Sampling Date: 07/23/2024

Applicant/Owner: National Park Service State: GA Sampling Point: WL 2 wet

Investigator(s): B Tsang; L Seifert; S Henry Section, Township, Range: N/A ☑ Wet ☐ Upl

Landform (hillslope, terrace, etc.): Roadside slope Local relief (concave, convex, none): Concave Slope (%): 2-10%

Subregion (LRR or MLRA): LRR T; MLRA 153B Lat: 32.02689° Long: -80.89616° Datum: WGS 1984

Soil Map Unit Name: Mae - Made land NWI classification: none

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ 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 ☐	**Is the Sampled Area within a Wetland?**	**Yes** ☑	**No** ☐
Hydric Soil Present?	Yes ☑	No ☐			
Wetland Hydrology Present?	Yes ☑	No ☐			

Remarks:
COWARDIN CLASS: PSS1Jdh

Field ID: WL2

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)
- ☐ Marl Deposits (B15) (**LRR U**)
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (**LRR T, U**)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WL 2 wet: Wet

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Sapling Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 15 ft)			
1. *Baccharis halimifolia*	20	yes	FAC
2.			
3.			
4.			
5.			
6.			
	20 =Total Cover		
50% of total cover: 10	20% of total cover: 4		

Herb Stratum (Plot size: 5 ft)			
1. *Paspalum notatum*	40	yes	FACU
2. *Distichlis spicata*	40	yes	OBL
3. *Phyla nodiflora*	25	no	FAC
4. *Hydrocotyle umbellata*	25	no	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	130 =Total Cover		
50% of total cover: 65	20% of total cover: 26		

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL Species	65	x 1 =	65
FACW Species	0	x 2 =	0
FAC Species	45	x 3 =	135
FACU Species	40	x 4 =	160
UPL Species	0	x 5 =	0
Columns Totals:	150 (A)		360 (B)

Prevalence Index = B/A = 2.4

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is > 50%
- ☑ 3 - Prevalence Index is ≤ 3.0[1]
- ☐ 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** ☐

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

SOIL Sampling Point: WL 2 wet: Wet

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
0–3	10YR 2/1	100			MS	M	Loamy Sand	
3–15	10YR 3/1	97	7.5YR 3/3	3	RM	PL	Sand	
								Refusal @ 15"

[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)
- ☐ Organic Bodies (A6) (**LRR P, T, U**)
- ☐ 5 cm Mucky Mineral (A7) (**LRR P, T,** U)
- ☐ Muck Presence (A8) (**LRR U**)
- ☐ 1 cm Muck (A9) (**LRR P, T**)
- ☑ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) (**MLRA 150A**)
- ☐ Sandy Mucky Mineral (S1) (**LRR O, S**)
- ☐ Sandy Gleyed Matrix (S4)
- ☑ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR P, S, T, U**)
- ☐ Polyvalue Below Surface (S8) (**LRR S, T, U**)
- ☐ Thin Dark Surface (S9) (**LRR S, T, U**)
- ☐ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- ☐ Loamy Mucky Mineral (F1) (**LRR O**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) (LRR U)
- ☐ Depleted Ochric (F11) (**MLRA 151**)
- ☐ Iron-Manganese Masses (F12) (**LRR O, P, T**)
- ☐ Umbric Surface (F13) (**LRR P, T, U**)
- ☐ Delta Ochric (F17) (**MLRA 151**)
- ☐ Reduced Vertic (F18) (**MLRA 150A, 150B**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 149A, 153C, 153D**)
- ☐ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR O**)
- ☐ 2 cm Muck (A10) (**MLRA 147**)
- ☐ Coast Prairie Redox (A16) **(outside MLRA 150A)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) (**LRR P, T**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 153B**)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12) **(outside MLRA 138, 152A in FL, 154)**
- ☐ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Packed gravel fill, road shoulder

Depth (inches): 15

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region
See ERDC/EL TR-10-20; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 04/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Fort Pulaski National Monument City/County: Savannah (Chatham County) Sampling Date: 07/23/2024

Applicant/Owner: National Park Service State: GA Sampling Point: WL 2 upl

Investigator(s): B Tsang; L Seifert; S Henry Section, Township, Range: N/A ☐ Wet ☑ Upl

Landform (hillslope, terrace, etc.): Road shoulder Local relief (concave, convex, none): Convex Slope (%): 25-50%

Subregion (LRR or MLRA): LRR T; MLRA 153B Lat: 32.02691° Long: -80.89619° Datum: WGS 1984

Soil Map Unit Name: Mae - Made land NWI classification: none

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

Are Vegetation ☑, Soil ☑, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ 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 ☑	**Is the Sampled Area within a Wetland?**	**Yes** ☐	**No** ☑
Hydric Soil Present?	Yes ☐	No ☑			
Wetland Hydrology Present?	Yes ☐	No ☑			

Remarks:
Disturbance note: graded/filled mowed road shoulder

Field ID: UP2

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)
- ☐ Marl Deposits (B15) (**LRR U**)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (**LRR T, U**)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches):		
Water Table Present?	Yes ☐	No ☑	Depth (inches):		
Saturation Present? (includes capillary fringe)	Yes ☐	No ☑	Depth (inches):	Wetland Hydrology Present?	Yes ☐ No ☑

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WL 2 upl: Upl

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Sapling Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 5 ft)			
1. *Paspalum notatum*	50	yes	FACU
2. *Bouteloua dactyloides*	50	yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 =Total Cover		
50% of total cover: 50	20% of total cover: 20		

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

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 (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	100	x 4 =	400
UPL Species	0	x 5 =	0
Columns Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is > 50%
- ☐ 3 - Prevalence Index is ≤ 3.0[1]
- ☐ 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** ☑

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

SOIL Sampling Point: WL 2 upl: Upl

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (Moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0–16	10YR 4/3	100					Silty Sand	
								Refusal @ 16"

[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)
- ☐ Organic Bodies (A6) (**LRR P, T, U**)
- ☐ 5 cm Mucky Mineral (A7) (**LRR P, T,** U)
- ☐ Muck Presence (A8) (**LRR U**)
- ☐ 1 cm Muck (A9) (**LRR P, T**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) (**MLRA 150A**)
- ☐ Sandy Mucky Mineral (S1) (**LRR O, S**)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR P, S, T, U**)
- ☐ Polyvalue Below Surface (S8) (**LRR S, T, U**)
- ☐ Thin Dark Surface (S9) (**LRR S, T, U**)
- ☐ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- ☐ Loamy Mucky Mineral (F1) (**LRR O**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) (LRR U)
- ☐ Depleted Ochric (F11) (**MLRA 151**)
- ☐ Iron-Manganese Masses (F12) (**LRR O, P, T**)
- ☐ Umbric Surface (F13) (**LRR P, T, U**)
- ☐ Delta Ochric (F17) (**MLRA 151**)
- ☐ Reduced Vertic (F18) (**MLRA 150A, 150B**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 149A, 153C, 153D**)
- ☐ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR O**)
- ☐ 2 cm Muck (A10) (**MLRA 147**)
- ☐ Coast Prairie Redox (A16) **(outside MLRA 150A)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) (**LRR P, T**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 153B**)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12) **(outside MLRA 138, 152A in FL, 154)**
- ☐ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Packed road fill

Depth (inches): 16

Hydric Soil Present? **Yes** ☐ **No** ☑

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region
See ERDC/EL TR-10-20; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 04/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Fort Pulaski National Monument City/County: Savannah (Chatham County) Sampling Date: 07/23/2024

Applicant/Owner: National Park Service State: GA Sampling Point: WL 3 wet

Investigator(s): B Tsang; L Seifert; S Henry Section, Township, Range: N/A ☑ Wet ☐ Upl

Landform (hillslope, terrace, etc.): Trailside Local relief (concave, convex, none): Concave Slope (%): 0-2%

Subregion (LRR or MLRA): LRR T; MLRA 153B Lat: 32.02859° Long: -80.89165° Datum: WGS 1984

Soil Map Unit Name: Mae - Made land NWI classification: none

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ 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 ☐	**Is the Sampled Area within a Wetland?**	**Yes** ☑	**No** ☐
Hydric Soil Present?	Yes ☑	No ☐			
Wetland Hydrology Present?	Yes ☑	No ☐			

Remarks:
COWARDIN CLASS: PFO3h

Field ID: WL3

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)
- ☐ Marl Deposits (B15) (**LRR U**)
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (**LRR T, U**)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WL 3 wet: Wet

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Sabal palmetto*	75	yes	FAC
2.			
3.			
4.			
5.			
6.			
	75 =Total Cover		
50% of total cover: 37.5	20% of total cover: 15		

Sapling Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 15 ft)			
1. *Ilex vomitoria*	30	yes	FAC
2.			
3.			
4.			
5.			
6.			
	30 =Total Cover		
50% of total cover: 15	20% of total cover: 6		

Herb Stratum (Plot size: 5 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL Species	0	x 1 =	0
FACW Species	0	x 2 =	0
FAC Species	105	x 3 =	315
FACU Species	0	x 4 =	0
UPL Species	0	x 5 =	0
Columns Totals:	105 (A)		315 (B)

Prevalence Index = B/A = 3

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is > 50%
- ☑ 3 - Prevalence Index is ≤ 3.0[1]
- ☐ 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** ☐

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

SOIL Sampling Point: WL 3 wet: Wet

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
0–3	10YR 3/1	100					Loamy Sand	
3–15	10YR 6/2	90	7.5YR 4/4	10	RM	PL	Sand	
15–24	10YR 4/1	100					Silty Clay	Dense clay

[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)
- ☐ Organic Bodies (A6) (**LRR P, T, U**)
- ☐ 5 cm Mucky Mineral (A7) (**LRR P, T,** U)
- ☐ Muck Presence (A8) (**LRR U**)
- ☐ 1 cm Muck (A9) (**LRR P, T**)
- ☑ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) (**MLRA 150A**)
- ☐ Sandy Mucky Mineral (S1) (**LRR O, S**)
- ☐ Sandy Gleyed Matrix (S4)
- ☑ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR P, S, T, U**)
- ☐ Polyvalue Below Surface (S8) (**LRR S, T, U**)
- ☐ Thin Dark Surface (S9) (**LRR S, T, U**)
- ☐ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- ☐ Loamy Mucky Mineral (F1) (**LRR O**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) (LRR U)
- ☐ Depleted Ochric (F11) (**MLRA 151**)
- ☐ Iron-Manganese Masses (F12) (**LRR O, P, T**)
- ☐ Umbric Surface (F13) (**LRR P, T, U**)
- ☐ Delta Ochric (F17) (**MLRA 151**)
- ☐ Reduced Vertic (F18) (**MLRA 150A, 150B**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 149A, 153C, 153D**)
- ☐ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR O**)
- ☐ 2 cm Muck (A10) (**MLRA 147**)
- ☐ Coast Prairie Redox (A16) **(outside MLRA 150A)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) (**LRR P, T**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 153B**)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12) **(outside MLRA 138, 152A in FL, 154)**
- ☐ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- ☐ 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** ☐

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region
See ERDC/EL TR-10-20; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 04/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Fort Pulaski National Monument City/County: Savannah (Chatham County) Sampling Date: 07/23/2024

Applicant/Owner: National Park Service State: GA Sampling Point: WL 3 upl

Investigator(s): B Tsang; L Seifert; S Henry Section, Township, Range: N/A ☐ Wet ☑ Upl

Landform (hillslope, terrace, etc.): Trail bed Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR or MLRA): LRR T; MLRA 153B Lat: 32.02859° Long: -80.89161° Datum: WGS 1984

Soil Map Unit Name: Mae - Made land NWI classification: none

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

Are Vegetation ☑, Soil ☑, or Hydrology ☑ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ 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 ☑	**Is the Sampled Area within a Wetland?**	**Yes** ☐	**No** ☑
Hydric Soil Present?	Yes ☐	No ☑			
Wetland Hydrology Present?	Yes ☐	No ☑			

Remarks:
Disturbance note: compacted gravel trail

Field ID: UP3

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)
- ☐ Marl Deposits (B15) (**LRR U**)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (**LRR T, U**)

Field Observations:

Surface Water Present? Yes ☐ No ☐ Depth (inches): _____

Water Table Present? Yes ☐ No ☐ Depth (inches): _____

Saturation Present? Yes ☐ No ☐ Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WL 3 upl: Upl

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Sabal palmetto*	30	yes	FAC
2.			
3.			
4.			
5.			
6.			
	30 =Total Cover		
50% of total cover: 15	20% of total cover: 6		

Sapling Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 5 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL Species	0	x 1 =	0
FACW Species	0	x 2 =	0
FAC Species	30	x 3 =	90
FACU Species	0	x 4 =	0
UPL Species	0	x 5 =	0
Columns Totals:	30 (A)		90 (B)

Prevalence Index = B/A = 3

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is > 50%
- ☑ 3 - Prevalence Index is ≤ 3.0[1]
- ☑ 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** ☑

Remarks: (Include photo numbers here or on a separate sheet.)
PACKED GRAVEL TRAIL. *S. palmetto* is rooted in adjacent wetland. No vegetation rooted within path width. Hard packed gravel surface under regular maintenance (top dressing) and subject to frequent foot/vehicle traffic.

SOIL Sampling Point: WL 3 upl: Upl

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (Moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
	10YR 6/1	100					Sand	Refusal

[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)
- ☐ Organic Bodies (A6) (**LRR P, T, U**)
- ☐ 5 cm Mucky Mineral (A7) (**LRR P, T,** U)
- ☐ Muck Presence (A8) (**LRR U**)
- ☐ 1 cm Muck (A9) (**LRR P, T**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) (**MLRA 150A**)
- ☐ Sandy Mucky Mineral (S1) (**LRR O, S**)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR P, S, T, U**)
- ☐ Polyvalue Below Surface (S8) (**LRR S, T, U**)
- ☐ Thin Dark Surface (S9) (**LRR S, T, U**)
- ☐ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- ☐ Loamy Mucky Mineral (F1) (**LRR O**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) (LRR U)
- ☐ Depleted Ochric (F11) (**MLRA 151**)
- ☐ Iron-Manganese Masses (F12) (**LRR O, P, T**)
- ☐ Umbric Surface (F13) (**LRR P, T, U**)
- ☐ Delta Ochric (F17) (**MLRA 151**)
- ☐ Reduced Vertic (F18) (**MLRA 150A, 150B**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 149A, 153C, 153D**)
- ☐ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR O**)
- ☐ 2 cm Muck (A10) (**MLRA 147**)
- ☐ Coast Prairie Redox (A16) **(outside MLRA 150A)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) (**LRR P, T**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 153B**)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12) **(outside MLRA 138, 152A in FL, 154)**
- ☐ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Packed gravel path

Depth (inches): 0

Hydric Soil Present? **Yes** ☐ **No** ☑

Remarks:
HARD-PACKED GRAVEL PATHWAY. Surface is hard packed gravel, effectively approximating paved surface. Tool refusal at surface (0 inches). Surface soil stratum was loose surface sand only. No accurate soil profile data available.

NPS Riverine Wetland Survey Form (page 1)

Resource ID: **STR 4**

Survey Site Information:

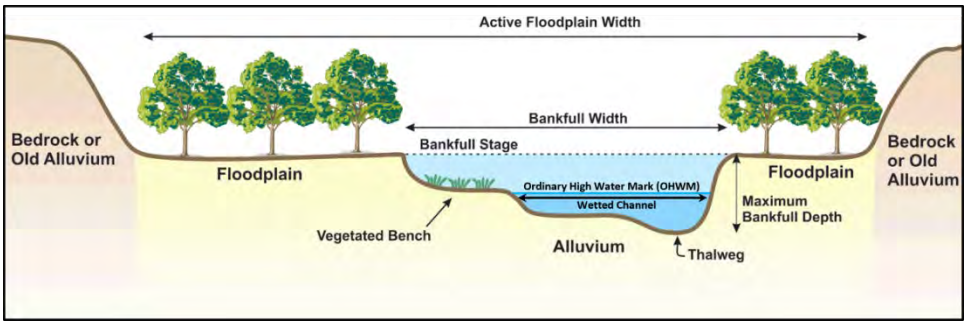
DATE	07/24/2024
LATITUDE	32.028446°
LONGITUDE	-80.893952°
ECOREGION	Atlantic and Gulf Coastal Plain

PROJECT / SITE	FOPU DCP 2024
CITY / COUNTY / STATE	Savannah (Chatham County)
EVALUATORS	B Tsang; L Seifert; S Henry
FIELD ID	Str4

Riverine Wetland Physical Properties:

	Width (ft)	**Depth** (ft)
Top of Bank	8	3
OHWM	4	0.5
Wetted Width	4	0.5

Bank Slope Angle	40–60° (steep)
Flow Conditions	None (stagnant)
Flow Direction	East (assumed per topo)



Riverine Wetland Characteristics:

OHWM Indicators	
☐	Alluvial Deposition
☑	Bed and bank
☐	Leaf litter removal
☑	Litter and debris
☑	Matted/bent vegetation
☐	Natural line on bank
☑	Plant community change
☐	Scouring
☐	Sediment sorting
☐	Shelving
☐	Soil change
☑	Water staining
☐	Wracking
☑	Wrested Vegetation

Hydric Soil Indicators	
☐	Hydrogen Sulfide (A4)
☐	Depleted Below Dark Surface (A11)
☐	Sandy Mucky Mineral (S1)
☐	Sandy Gleyed Matrix (S4)
☑	Sandy Redox (S5)
☐	Stripped Matrix (S6)
☐	Dark Surface (S7)
☐	Loamy Mucky Mineral (F1)
☐	Loamy Gleyed Matrix (F2)
☑	Depleted Matrix (F3)
☐	Redox Dark Surface (F6)

Hydrophytic Vegetation	
Species:	**Indicator:**
1. *Typha latifolia*	OBL
2. *Juncus gerardii*	OBL
3. *Distichlis spicata*	OBL
4.	
5.	
6.	

Note: List up to 6 dominant hydrophytic species observed within the assessment reach or immediately adjacent floodplain.

Stream Substrate (Estimate percentage)	
Bedrock %	0
Cobble %	0
Rip-Rap %	0
Gravel %	0
Sand %	30
SiltClay %	60
Organic %	10
Other %	0

Riverine Wetland Functional Assessment:

Channel Status	Artificial channel (excavated ditch)
Channel Condition	Unnatural straightening
Stream Function	Fully functional

Turbidity	none
Water Quality Defects	none

Additional Notes:

Historic artificial ditch, constructed along former roadway (per FOPU staff).
No visible flow at time of survey.
Channel partially filled with apparently permanent standing stagnant water (assumed channel intersection with groundwater).

COWARDIN CLASS: R4SB7x

NPS Riverine Wetland Survey Form (page 2)

Resource ID: **STR 4**

Date: 07/24/2024	**Project/Site**: FOPU DCP 2024	**Latitude:** 32.028446°
Evaluator: B Tsang; L Seifert; S Henry	**County:** Savannah (Chatham County)	**Longitude:** -80.893952°
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** **21**	**Stream Determination** (select one) ☐ **Ephemeral** ☑ **Intermittent** ☐ **Perennial**	**Other:** *Field ID*: Str4

A. Geomorphology (Subtotal = **6.5**)	**Absent**	**Weak**	**Moderate**	**Strong**
1[a]. Continuity of channel bed and bank	☐ 0	☐ 1	☐ 2	☑ 3
2. Sinuosity of channel along thalweg	☑ 0	☐ 1	☐ 2	☐ 3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	☑ 0	☐ 1	☐ 2	☐ 3
4. Particle size of stream substrate	☐ 0	☑ 1	☐ 2	☐ 3
5. Active/relict floodplain	☐ 0	☐ 1	☑ 2	☐ 3
6. Depositional bars or benches	☑ 0	☐ 1	☐ 2	☐ 3
7. Recent alluvial deposits	☑ 0	☐ 1	☐ 2	☐ 3
8. Headcuts	☑ 0	☐ 1	☐ 2	☐ 3
9. Grade control	☑ 0	☐ 0.5	☐ 1	☐ 1.5
10. Natural valley	☐ 0	☑ 0.5	☐ 1	☐ 1.5
11. Second or greater order channel	☑ No = 0		☐ Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = **8.5**)

12. Presence of Baseflow	☐ 0	☐ 1	☑ 2	☐ 3
13. Iron oxidizing bacteria	☑ 0	☐ 1	☐ 2	☐ 3
14. Leaf litter	☐ 1.5	☑ 1	☐ 0.5	☐ 0
15. Sediment on plants or debris	☐ 0	☐ 0.5	☑ 1	☐ 1.5
16. Organic debris lines or piles	☐ 0	☐ 0.5	☐ 1	☑ 1.5
17. Soil-based evidence of high water table?	☐ No = 0		☑ Yes = 3	

C. Biology (Subtotal = **6**)

18. Fibrous roots in streambed	☐ 3	☐ 2	☑ 1	☐ 0
19. Rooted upland plants in streambed	☑ 3	☐ 2	☐ 1	☐ 0
20. Macrobenthos (note diversity and abundance)	☑ 0	☐ 1	☐ 2	☐ 3
21. Aquatic Mollusks	☑ 0	☐ 1	☐ 2	☐ 3
22. Fish	☑ 0	☐ 0.5	☐ 1	☐ 1.5
23. Crayfish	☑ 0	☐ 0.5	☐ 1	☐ 1.5
24. Amphibians	☑ 0	☐ 0.5	☐ 1	☐ 1.5
25. Algae	☐ 0	☑ 0.5	☐ 1	☐ 1.5
26. Wetland plants in streambed	☐ FACW = 0.75	☑ OBL = 1.5	☐ Other = 0	

*perennial streams may also be identified using other methods. See p. 35 of NC DWQ manual.

Notes:
Per FOPU staff, ditch retains water year-round, fed by surface and ground water. No evidence of existing surface connection.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region
See ERDC/EL TR-10-20; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 04/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Fort Pulaski National Monument City/County: Savannah (Chatham County) Sampling Date: 07/24/2024

Applicant/Owner: National Park Service State: GA Sampling Point: WL 5 wet

Investigator(s): B Tsang; L Seifert; S Henry Section, Township, Range: N/A ☑ Wet ☐ Upl

Landform (hillslope, terrace, etc.): Low field Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR or MLRA): LRR T; MLRA 153B Lat: 32.02830° Long: -80.89461° Datum: WGS 1984

Soil Map Unit Name: Mae - Made land NWI classification: none

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

Are Vegetation ☑, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ 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 ☐	**Is the Sampled Area within a Wetland?**	**Yes** ☑	**No** ☐
Hydric Soil Present?	Yes ☑	No ☐			
Wetland Hydrology Present?	Yes ☑	No ☐			

Remarks:
COWARDIN CLASS: PEM1h
Disturbance note: Maintained turf lawn at WL sample point. Typical native emergent species dominant throughout most of this WL adjacent to STR 4

Field ID: WL5

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)
- ☐ Marl Deposits (B15) (**LRR U**)
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (**LRR T, U**)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WL 5 wet: Wet

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Sapling Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 5 ft)			
1. *Zoysia matrella*	90	yes	UPL
2. *Hydrocotyle umbellata*	10	no	OBL
3. *Phyla nodiflora*	10	no	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	110 =Total Cover		
50% of total cover: 55	20% of total cover: 22		

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL Species	10	x 1 =	10
FACW Species	0	x 2 =	0
FAC Species	10	x 3 =	30
FACU Species	0	x 4 =	0
UPL Species	90	x 5 =	450
Columns Totals:	110 (A)		490 (B)

Prevalence Index = B/A = 4.45

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is > 50%
- ☐ 3 - Prevalence Index is ≤ 3.0[1]
- ☑ 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** ☐

Remarks: (Include photo numbers here or on a separate sheet.)
Problematic vegetation: Maintained turf lawn dominant with UPL *Zoysia* grass along roadway. Lawn transitions to near-100% *Distichlis spicata* (OBL) cover elsewhere in lawn. Typical native emergent species dominant throughout most of this WL adjacent to STR 4

SOIL Sampling Point: WL 5 wet: Wet

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
0–4	10YR 3/2	95	5YR 4/6	5	RM	PL	Loamy Sand	
4–18	10YR 5/1	90	5YR 4/6	10	RM	PL	Sandy Clay	

[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)
- ☐ Organic Bodies (A6) (**LRR P, T, U**)
- ☐ 5 cm Mucky Mineral (A7) (**LRR P, T,** U)
- ☐ Muck Presence (A8) (**LRR U**)
- ☐ 1 cm Muck (A9) (**LRR P, T**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) (**MLRA 150A**)
- ☐ Sandy Mucky Mineral (S1) (**LRR O, S**)
- ☐ Sandy Gleyed Matrix (S4)
- ☑ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR P, S, T, U**)
- ☐ Polyvalue Below Surface (S8) (**LRR S, T, U**)
- ☐ Thin Dark Surface (S9) (**LRR S, T, U**)
- ☐ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- ☐ Loamy Mucky Mineral (F1) (**LRR O**)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) (LRR U)
- ☐ Depleted Ochric (F11) (**MLRA 151**)
- ☐ Iron-Manganese Masses (F12) (**LRR O, P, T**)
- ☐ Umbric Surface (F13) (**LRR P, T, U**)
- ☐ Delta Ochric (F17) (**MLRA 151**)
- ☐ Reduced Vertic (F18) (**MLRA 150A, 150B**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 149A, 153C, 153D**)
- ☐ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR O**)
- ☐ 2 cm Muck (A10) (**MLRA 147**)
- ☐ Coast Prairie Redox (A16) **(outside MLRA 150A)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) (**LRR P, T**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 153B**)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12) **(outside MLRA 138, 152A in FL, 154)**
- ☐ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- ☐ 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** ☐

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region
See ERDC/EL TR-10-20; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 04/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Fort Pulaski National Monument City/County: Savannah (Chatham County) Sampling Date: 07/24/2024

Applicant/Owner: National Park Service State: GA Sampling Point: WL 5 upl

Investigator(s): B Tsang; L Seifert; S Henry Section, Township, Range: N/A ☐ Wet ☑ Upl

Landform (hillslope, terrace, etc.): Road shoulder Local relief (concave, convex, none): Concave Slope (%): 10-25%

Subregion (LRR or MLRA): LRR T; MLRA 153B Lat: 32.02825° Long: -80.89459° Datum: WGS 1984

Soil Map Unit Name: Mae - Made land NWI classification: none

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

Are Vegetation ☑, Soil ☑, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ 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 ☑	**Is the Sampled Area within a Wetland?**	**Yes** ☐	**No** ☑
Hydric Soil Present?	Yes ☐	No ☑			
Wetland Hydrology Present?	Yes ☐	No ☑			

Remarks:
Disturbance note: graded/filled mowed road shoulder

Field ID: UP5

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)
- ☐ Marl Deposits (B15) (**LRR U**)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (**LRR T, U**)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WL 5 upl: Upl

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Sabal palmetto*	10	yes	FAC
2.			
3.			
4.			
5.			
6.			
	10 =Total Cover		
50% of total cover: 5	20% of total cover: 2		

Sapling Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 5 ft)			
1. *Paspalum notatum*	100	yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 =Total Cover		
50% of total cover: 50	20% of total cover: 20		

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL Species	0	x 1 =	0
FACW Species	0	x 2 =	0
FAC Species	10	x 3 =	30
FACU Species	100	x 4 =	400
UPL Species	0	x 5 =	0
Columns Totals:	110 (A)		430 (B)

Prevalence Index = B/A = 3.91

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is > 50%
- ☐ 3 - Prevalence Index is ≤ 3.0[1]
- ☐ 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** ☑

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

SOIL Sampling Point: WL 5 upl: Upl

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
0–18	10YR 4/3	100					Silty Sand	

[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)
- ☐ Organic Bodies (A6) (**LRR P, T, U**)
- ☐ 5 cm Mucky Mineral (A7) (**LRR P, T,** U)
- ☐ Muck Presence (A8) (**LRR U**)
- ☐ 1 cm Muck (A9) (**LRR P, T**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) (**MLRA 150A**)
- ☐ Sandy Mucky Mineral (S1) (**LRR O, S**)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR P, S, T, U**)
- ☐ Polyvalue Below Surface (S8) (**LRR S, T, U**)
- ☐ Thin Dark Surface (S9) (**LRR S, T, U**)
- ☐ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- ☐ Loamy Mucky Mineral (F1) (**LRR O**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) (LRR U)
- ☐ Depleted Ochric (F11) (**MLRA 151**)
- ☐ Iron-Manganese Masses (F12) (**LRR O, P, T**)
- ☐ Umbric Surface (F13) (**LRR P, T, U**)
- ☐ Delta Ochric (F17) (**MLRA 151**)
- ☐ Reduced Vertic (F18) (**MLRA 150A, 150B**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 149A, 153C, 153D**)
- ☐ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR O**)
- ☐ 2 cm Muck (A10) (**MLRA 147**)
- ☐ Coast Prairie Redox (A16) **(outside MLRA 150A)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) (**LRR P, T**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 153B**)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12) **(outside MLRA 138, 152A in FL, 154)**
- ☐ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- ☐ 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** ☑

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region
See ERDC/EL TR-10-20; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 04/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Fort Pulaski National Monument City/County: Savannah (Chatham County) Sampling Date: 07/24/2024

Applicant/Owner: National Park Service State: GA Sampling Point: WL 6 wet

Investigator(s): B Tsang; L Seifert; S Henry Section, Township, Range: N/A ☑ Wet ☐ Upl

Landform (hillslope, terrace, etc.): Marsh fringe Local relief (concave, convex, none): Convex Slope (%): 2-10%

Subregion (LRR or MLRA): LRR T; MLRA 153B Lat: 32.02706° Long: -80.89292° Datum: WGS 1984

Soil Map Unit Name: Mae - Made land NWI classification: none

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ 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 ☐	**Is the Sampled Area within a Wetland?**	**Yes** ☑	**No** ☐
Hydric Soil Present?	Yes ☑	No ☐			
Wetland Hydrology Present?	Yes ☑	No ☐			

Remarks:
COWARDIN CLASS: PSS1Jdh

Field ID: WL6

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)
- ☐ Marl Deposits (B15) (**LRR U**)
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (**LRR T, U**)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 2

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WL 6 wet: Wet

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Sabal palmetto*	20	yes	FAC
2.			
3.			
4.			
5.			
6.			
	20	=Total Cover	

50% of total cover: 10 20% of total cover: 4

Sapling Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0	=Total Cover	

50% of total cover: 0 20% of total cover: 0

Shrub Stratum (Plot size: 15 ft)			
1. *Baccharis halimifolia*	25	yes	FAC
2.			
3.			
4.			
5.			
6.			
	25	=Total Cover	

50% of total cover: 12.5 20% of total cover: 5

Herb Stratum (Plot size: 5 ft)			
1. *Spartina alterniflora*	50	yes	OBL
2. *Hydrocotyle umbellata*	25	yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75	=Total Cover	

50% of total cover: 37.5 20% of total cover: 15

Woody Vine Stratum (Plot size: 30 ft)			
1. *Ampelopsis arborea*	25	yes	FAC
2.			
3.			
4.			
5.			
	25	=Total Cover	

50% of total cover: 12.5 20% of total cover: 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL Species	75	x 1 =	75
FACW Species	0	x 2 =	0
FAC Species	70	x 3 =	210
FACU Species	0	x 4 =	0
UPL Species	0	x 5 =	0
Columns Totals:	145 (A)		285 (B)

Prevalence Index = B/A = 1.97

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is > 50%
- ☑ 3 - Prevalence Index is ≤ 3.0[1]
- ☐ 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** ☐

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

SOIL Sampling Point: WL 6 wet: Wet

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
0–1	10YR 2/2	100					Loamy Sand	
1–10	10YR 4/1	70	7.5YR 4/4	5	RM	PL	Silty Clay	
1–10	10YR 3/1	25					Loamy Sand	Mixed fill matrx
10–18	10YR 5/2	75	7.5YR 4/6	25	RM	PL	Sand	

[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)
- ☐ Organic Bodies (A6) (**LRR P, T, U**)
- ☐ 5 cm Mucky Mineral (A7) (**LRR P, T,** U)
- ☐ Muck Presence (A8) (**LRR U**)
- ☐ 1 cm Muck (A9) (**LRR P, T**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) (**MLRA 150A**)
- ☐ Sandy Mucky Mineral (S1) (**LRR O, S**)
- ☐ Sandy Gleyed Matrix (S4)
- ☑ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR P, S, T, U**)
- ☐ Polyvalue Below Surface (S8) (**LRR S, T, U**)
- ☐ Thin Dark Surface (S9) (**LRR S, T, U**)
- ☐ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- ☐ Loamy Mucky Mineral (F1) (**LRR O**)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) (LRR U)
- ☐ Depleted Ochric (F11) (**MLRA 151**)
- ☐ Iron-Manganese Masses (F12) (**LRR O, P, T**)
- ☐ Umbric Surface (F13) (**LRR P, T, U**)
- ☐ Delta Ochric (F17) (**MLRA 151**)
- ☐ Reduced Vertic (F18) (**MLRA 150A, 150B**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 149A, 153C, 153D**)
- ☐ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR O**)
- ☐ 2 cm Muck (A10) (**MLRA 147**)
- ☐ Coast Prairie Redox (A16) **(outside MLRA 150A)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) (**LRR P, T**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 153B**)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12) **(outside MLRA 138, 152A in FL, 154)**
- ☐ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- ☐ 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** ☐

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region
See ERDC/EL TR-10-20; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 04/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Fort Pulaski National Monument City/County: Savannah (Chatham County) Sampling Date: 07/24/2024

Applicant/Owner: National Park Service State: GA Sampling Point: WL 6 upl

Investigator(s): B Tsang; L Seifert; S Henry Section, Township, Range: N/A ☐ Wet ☑ Upl

Landform (hillslope, terrace, etc.): Septic field Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR or MLRA): LRR T; MLRA 153B Lat: 32.02709° Long: -80.89295° Datum: WGS 1984

Soil Map Unit Name: Mae - Made land NWI classification: none

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

Are Vegetation ☑, Soil ☑, or Hydrology ☑ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ 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 ☑	**Is the Sampled Area within a Wetland?**	**Yes** ☐	**No** ☑
Hydric Soil Present?	Yes ☐	No ☑			
Wetland Hydrology Present?	Yes ☐	No ☑			

Remarks:
Disturbance note: Septic system constructed in raised grade (fill)

Field ID: UP6

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)
- ☐ Marl Deposits (B15) (**LRR U**)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (**LRR T, U**)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WL 6 upl: Upl

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Sapling Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 5 ft)			
1. *Zoysia matrella*	100	yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 =Total Cover		
50% of total cover: 50	20% of total cover: 20		

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 =Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 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	0	x 4 =	0
UPL Species	100	x 5 =	500
Columns Totals:	100 (A)		500 (B)

Prevalence Index = B/A = 5

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is > 50%
- ☐ 3 - Prevalence Index is ≤ 3.0[1]
- ☐ 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** ☑

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

SOIL Sampling Point: WL 6 upl: Upl

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
0–4	10YR 4/2	100					Silty Sand	Refusal

[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)
- ☐ Organic Bodies (A6) (**LRR P, T, U**)
- ☐ 5 cm Mucky Mineral (A7) (**LRR P, T,** U)
- ☐ Muck Presence (A8) (**LRR U**)
- ☐ 1 cm Muck (A9) (**LRR P, T**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) (**MLRA 150A**)
- ☐ Sandy Mucky Mineral (S1) (**LRR O, S**)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR P, S, T, U**)
- ☐ Polyvalue Below Surface (S8) (**LRR S, T, U**)
- ☐ Thin Dark Surface (S9) (**LRR S, T, U**)
- ☐ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- ☐ Loamy Mucky Mineral (F1) (**LRR O**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) (LRR U)
- ☐ Depleted Ochric (F11) (**MLRA 151**)
- ☐ Iron-Manganese Masses (F12) (**LRR O, P, T**)
- ☐ Umbric Surface (F13) (**LRR P, T, U**)
- ☐ Delta Ochric (F17) (**MLRA 151**)
- ☐ Reduced Vertic (F18) (**MLRA 150A, 150B**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 149A, 153C, 153D**)
- ☐ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR O**)
- ☐ 2 cm Muck (A10) (**MLRA 147**)
- ☐ Coast Prairie Redox (A16) **(outside MLRA 150A)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) (**LRR P, T**)
- ☐ Anomalous Bright Loamy Soils (F20) (**MLRA 153B**)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12) **(outside MLRA 138, 152A in FL, 154)**
- ☐ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- ☐ 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** ☑

Remarks:

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

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U.S. Department of the Interior

Fort Pulaski National Monument
Development Concept Plan

September 2024

