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The Tide Is Coming In: Fort Pulaski's Historical Relationship With Water

An Honors Thesis submitted in partial fulfillment of the requirements for Honors in History.

By
Sadie Ingram

Under the mentorship of Dr. Michael Van Wagenen

ABSTRACT

Savannah, Georgia is the fourth busiest port in the United States, processing approximately 4.35 million standard shipping containers every year. The port's protector Fort Pulaski towers among the coastal marshlands and estuaries of the Savannah River. Located on Cockspur Island at the mouth of the Savannah River, this strategic location allowed the fort to protect Savannah's vital harbor. Built as part of the United States' Third System plan to build fortifications along the eastern seaboard, construction of Fort Pulaski began in 1827 and finished twenty years later.

Water has played a pivotal role in the history of Fort Pulaski and Cockspur Island. Since its construction, the fort has been battling the Lowcountry landscape to remain on high ground. While water proved to be a military advantage before the Civil War, as weapons technology advanced, Third System forts were left behind. Following the war, Pulaski underwent changes to become a historic site. Instead of battling invading armies and navies, the fort faced growing problems from its environment that were detrimental to its preservation.

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Guarding a city whose location was chosen for its coastal landscape, Fort Pulaski towers among the marshlands and estuaries of the Savannah River. The fortification was named after Count Casimir Pulaski, the Revolutionary War hero who died from wounds sustained in the Siege of Savannah in 1779. Built as part of the United States' Third System plan to construct fortifications along the eastern seaboard, the construction of Fort Pulaski began in 1829 and finished twenty years later.¹

This thesis documents the role that water played in shaping the history of Fort Pulaski, from its construction through Hurricane Irma in 2017. The United States government chose the city of Savannah because of its proximity to the Atlantic Ocean and the river that enabled the transport of goods and people inland. Cockspur Island was an excellent choice, because it was not only militarily strategic, it also served in other national interests during peacetimes such as a quarantine station and customs checkpoint. The fort's unique surroundings also contributed to its preservation and capacity to be a National Park Service site.² For the purposes of this study, relevant water is defined as the surrounding environmental features of saltwater marshes, the Atlantic Ocean, the Savannah River, seasonal precipitation, and storm surges.

The unique coastal landscape of Cockspur Island provides an interesting area to study the historical role of water in Third System fortifications. The United States Board of Engineers for Fortifications adopted Third System forts following the War of 1812, after learning how America's previous coastal defenses were outdated. The United States

1. Daniel A. Brown, "Fort Pulaski: April 1862: Fort Pulaski, Georgia (GA001), Chatham County, April 10-11, 1862." *Civil War Battlefield Guide*, (1998): 63–67.

2. *Fort Pulaski National Monument Guidebook, 1940*. National Park Service.

Army Corp of Engineers (USACE) built forty-two fortifications from Maine to Louisiana to combat any potential British naval assaults.³ Before the development of railways, water was the dominant method to transport large quantities of goods and people. Therefore, location along the river was a key factor in selecting Savannah as Georgia's first settlement. Viewing water as a historical actor, this research includes an exploration into how the hydrological landscape affected the decision to build Fort Pulaski on Cockspur Island, Fort Pulaski's location in relation to Civilian Conservation Corps (CCC) work, and water's role in the National Park's management of the site.

Water was the primary environmental concern during the planning and construction of the military installation. Fort Pulaski is situated in the Lowcountry, an environmental area characterized by saltwater marshes and mudflats that stretches between Charleston, South Carolina, and Savannah, Georgia. The vast marsh is the first thing that visitors to the national monument see as they cross the Bull River while leaving Savannah. In 1829, a recent West Point graduate, Robert E. Lee, was tasked with designing the complex dike system needed to drain the marsh on Cockspur Island to build the fort.⁴ Maps from 1862 show that the site was the only dry land in the area, providing evidence that Lee's drainage system was working as planned.⁵ This wet landscape convinced many military strategists at the dawn of the Civil War that Fort Pulaski was an invincible fortress because enemies could not get within range to damage its brick and

3. Stephen W. Henderson, "American Coastal Defence Third System Forts: How Geomorphology And Geology Dictated Placement And Influenced History," *Geological Society* (2018): 473, 61-82.

4. Brown, "Fort Pulaski: April 1862," 63-67.

5. "Cockspur Island," *National Parks Service*, U.S. Department of the Interior, accessed February 23, 2020, <https://www.nps.gov/fopu/learn/historyculture/cockspur-island.htm>.

mortar walls. General Joseph Totten, the United States Chief of Engineers, stated that if you were to attack Fort Pulaski, “you might as well bombard the Rocky Mountains.”⁶

Fort Pulaski was built on top of the ruins of an earth and log fort constructed by the United States military shortly after the Revolutionary War. The original structure was named Fort Green and guarded the mouth of the Savannah River for ten years until a hurricane washed it away in 1804.⁷ The builders did not anticipate that Fort Pulaski was destined to face the same destructive forces as Fort Green. While the brickwork fortification withstood high-speed hurricane winds better than the earthen log fort, the masonry could not stop the fort from being flooded numerous times over its existence. The Lowcountry landscape is susceptible to flooding, and the dike system fell into disrepair after the Civil War, expediting the process of the marsh reclaiming the fort. Water erosion along the wharves and banks of Cockspur Island from the Savannah River also became a problem for the future national monument.

No environmental history has been written on Fort Pulaski. The National Park Service (NPS) and other groups have conducted numerous studies on the effects of coastal storms, hurricanes, and river erosion on Fort Pulaski and Cockspur Island throughout the decades since it came under the control of the Department of Interior. However, these scientific studies all focused on the physical effects of water on the national monument and surrounding environment. Rather than working through a historical framework, these studies analyze topics such as the effect of water erosion on

6. Ralston B. Lattimore, *Fort Pulaski National Monument—Georgia*, National Park Service of the United States Department of the Interior, Fort Pulaski National Monument, Historical Handbook Series 18 (Washington, D.C: National Park Service, 1954), 26.

7. “Cockspur Island,” National Park Service.

historic docks, the effect of rising ocean levels on the local bird populations, and shoreline erosion from the marsh. Significant research has been done on the environment of the area and about the history of the fort but lacks research on how those two topics interact with each other.⁸ This thesis will instead explore water as a historical actor impacting both human actions and the physical features of the fortification.

Cockspur Island's Forts

Cockspur was a strategic location for a defense structure due to its aquatic landscape.⁹ It is located in the middle of the Savannah River near its confluence with the Atlantic Ocean. To the north and south are marshlands and mudflats, and to the southeast sits Tybee Island. The city of Savannah is approximately eleven miles upriver to the west of Cockspur, and the Atlantic Ocean is directly to the east of the island. The island parallels the river and is approximately two and a half miles long and two-thirds of a mile across at its widest point including the marsh. Measured only by its dry land, Cockspur is only one and a half miles long and a little under one-third of a mile wide.

Seacoast forts were vital in securing harbors from an invasion by sea. Commercial ships and navies were stationed out of harbors and were assets to be protected at all costs. Protection was not the only job of a coastal fortification. A fort's armed presence prevented the enemy from taking control of important supplies and provided the ability to have their supplies shipped to them. The goal was to deter the enemy from attempting to

8. Here are just a few examples from the multitude of scientific research done at the monument. Chris Houser, "Relative Importance of Vessel-Generated and Wind Waves to Salt Marsh Erosion in a Restricted Fetch Environment." *Journal of Coastal Research* 26, no. 2 (2010): 230, doi:10.2112/08-1084.1.; Starkey EN and Others, "Assessment of estuarine water and sediment quality at Fort Pulaski National Monument: 2018 data summary", *Natural Resource Data Series*, (National Park Service, 2019).; Southeast Coast Network, "Shoreline Monitoring Protocol Brief", (Southeast Coast Network, 2017).

9. See Appendix A. for map of Cockspur Island, Tybee Island, and the mouth of the Savannah River.

take the harbor, and instead forcing them to land in a strategically poor location farther away from the harbor, giving the army enough time to rally a defense.¹⁰ For example, during the War of 1812, Fort McHenry forced British forces to land east of the city instead of taking the port through a direct naval bombardment. After the American army caused heavy casualties, the British called in the navy to take the fort. However, McHenry was able to keep the navy out of the harbor and unable to assist with the land assault. This cemented its victory for the Battle of Baltimore.¹¹

The success of a fort like McHenry depended upon the enemy's chosen plan of attack. Two professors from the United States Military Academy at West Point, Dennis Hart Mahan and Henry Wager Halleck, created three assault plans on how to best defeat a coastal fortification. Together they determined that the three ways a coastal fortification could be taken were by naval ships, siege, or land assault.¹²

With no high land near the island, and the waterways around the fort too shallow for a wooden warship to approach, Cockspur was protected by its landscape. This left a distant attack by naval ships or a siege as the only offensive options. Ships are inferior when attacking land fortifications because forts provide greater protection for the men inside. Sailors were not afforded the same defenses. Seacoast forts had a common practice of skipping cannonballs across the water to their targets.¹³ If a round struck a

10. Lewis Russell F. Weigley, *The American Way of War: A History of United States Military Strategy and Policy* (New York: MacMillian Publishing Company, Inc, 1973), 60.

11. "Fort McHenry," Battlefields.org, American Battlefield Trust, accessed on March 7, 2021.

12. David P. Eldridge, "Brick Versus Earth: The Construction and Destruction of Confederate Seacoast Forts Pulaski and McAllister, Georgia" (master's thesis, University of North Florida, 1996), 20.

13. Lindsey Walsworth, "Sea Level Rise and Climate Change Threaten the Historic System Forts of the Gulf Coast," *Preservation in Print* (June 2020).

ship, the wood would splinter and turn into lethal shrapnel.¹⁴ Additionally, ships were easier to cripple than forts because one well-aimed projectile could sink a ship.¹⁵ Naval bombardments were less accurate, because a ship rocking in the water provided an unstable platform for aiming cannons. For a ship to be accurate enough to cause damage to a coastal fort, it had to be within 1,000 yards, which put it in danger of being too close to the fort's artillery.¹⁶ All of this meant that it would be difficult to launch a naval attack on any fortification on Cockspur Island. This made it a strategic military location for the forts built upon it and left a siege as the only presumed viable option.

Cockspur Island as a Military Outpost

Water played an important role in the forts that preceded Fort Pulaski on Cockspur Island. Fort George dated back to the colonialization of Georgia and the creation of Savannah. The island was deemed an important vantage point to protect the growing port city from the Spanish in St. Augustine.¹⁷ As the colony became more prosperous, the fort fell into disarray. Fort Green was built after the American Revolution was won, as part of the "First American System of Fortifications."¹⁸ This fort was

14. Eldridge, "Brick Versus Earth," 21.

15. Henry W. Halleck, *Elements of Military Art and Science Or, Course of Instruction in Strategy, Fortification, Tactics of Battles, &c. Embracing the Duties of Staff, Infantry, Cavalry, Artillery, and Engineers*, Third Ed (New York: D. Appleton & Co, 1862), 163.

16. Ibid., 189-191

17. Susan Hitchcock, *Fort Pulaski National Monument: Cockspur Island Historic District Cultural Landscape Report* (Cultural Resources Division Southeast Regional Office: National Park Service, 2011), 6.

18. Ibid., 8

destroyed by a hurricane in 1804 that flooded the entire island and killed half of the twenty-six soldiers stationed there at the time.¹⁹

Fort Pulaski

The Board for Fortifications of Sea Coast Defense approved the construction of Fort Pulaski in September 1829.²⁰ Construction would go on for roughly the next eighteen years until the fort was completed in 1847. Pulaski was built as a part of the Third System of forts, after the War of 1812 proved current coastal defense systems were inadequate.²¹ Due to a lack of suitable defenses around Washington, D.C., the British were able to easily capture and burn the capital. Third System forts were designed to safeguard against invading navies and full-scale invasions to make sure that what happened during the War of 1812 never happened again.²² The fortifications utilized all of the modern defense techniques of the time to create seemingly invincible defenses. As opposed to the usual one tier of cannons in First and Second System forts, Third System forts had at least two tiers. Their characteristics included “structural durability, a high concentration of armament, and enormous overall firepower.”²³ A distinguishing feature of this system is that forts were multi-story masonry structures that were permanent and ready to launch an assault at a moment’s notice.

19. David M. Ludlum, *Early American Hurricanes, 1492-1870* (Boston: American Meteorological Society, 1963), 54.

20. Rogers W. Young, "The Construction Of Fort Pulaski," *The Georgia Historical Quarterly* 20, no. 1 (1936): 41-51.

21. Hitchcock, *Cultural Landscape Report*, 9.

22. Mark A. Smith, “The End of An Era? The Fall of Fort Pulaski and the End of Third System Defense Policy,” *Journal of the Georgia Association of Historians* 26 (December 2005): 99.

23. Emanuel R. Lewis, *Seacoast Fortifications of the United States: An Introduction History*, revised ed (Annapolis: Naval Institute Press, 1993), 42.

Fort Pulaski was modeled after Fort Sumter, another Third System fort in Charleston, South Carolina. The forts shared identical pentagonal shapes, except the point of Fort Pulaski pointed east towards the Atlantic Ocean and Fort Sumter's pointed north towards Mt. Pleasant, South Carolina. Fort Pulaski's orientation allowed it to have an armed face on either bank of the Savannah River. Savannah's fort is one story shorter than Charleston's due to the marshy land upon which it was built. The mud was simply not stable enough to support a three-story masonry fort with its armaments.²⁴

To combat the lack of solid dry ground, dikes were dug to divert water away from Pulaski.²⁵ Although Robert E. Lee is widely credited with designing and constructing the dike system, Joseph K. F. Mansfield deserves the real credit. Lee was only there from 1829 until 1831, while Mansfield was there from 1831 until 1845.²⁶ Mansfield was the engineer who oversaw the dike system's construction. The original dike was a two-mile-long perimeter around the driest parts of the island, parallel to the south channel of the Savannah River.²⁷ Workers dug ditches from the south side of the island perpendicular to the fort and installed tidal gates to control the flow of water into the island.²⁸ Mansfield also corrected the original engineer Major Samuel Babcock's survey plans, because they were inaccurate and poorly designed. He made two major changes to Babcock's plans,

24. Lattimore, *Fort Pulaski -- Georgia*, 6.

25. My research for this section was impacted by the COVID-19 pandemic. The Library of Congress in Washington, D.C. and the National Archives and Records Administration in Atlanta were closed throughout the duration of my research period. I was unable to access materials such as maps, blueprints, and Joseph K. Mansfield's personal papers for information about how the dike system was built because they were only available in-person and not online.

26. Hitchcock, *Cultural Landscape Report*, 26.

27. See Appendix B. for an illustrated map of the dike system.

28. Ibid.

increasing the number of support pilings beneath the fort and changing the stone to brick for the masonry walls of the fort. The sodden land of Cockspur needed reinforcing if a massive fortification was to be built on top of it. The timber pilings acted to further support the fort by being driven into the solid ground beneath the marsh.²⁹

Ft. Pulaski Sees Action

Savannahians grew nervous when in December of 1860, U.S. Major Robert Anderson took control of Fort Sumter after South Carolina seceded from the Union. They were afraid that having federal troops control Charleston Harbor would mean Savannah would be next should Georgia secede. Members of the city petitioned for the governor of Georgia, Joseph E. Brown, to take Pulaski from United States control. He ordered Colonel Alexander Lawton, a member of the 1st Georgia Volunteer Regiment to preemptively take Fort Pulaski from the United States government. While the Confederate States of America had not formed yet, Lawton was a member of the Georgia Secessionist Movement.³⁰ Col. Lawton took the fort on January 4, 1861, and placed Hugh Mercer and Charles H. Olmstead in charge of the fort and its men.³¹ The handover was peaceful as the caretaker of the fort surrendered the twenty 32-pounder cannons, a small supply of black powder, and a handful of solid shot.³² In early autumn, Maj. Olmstead became a colonel and took over as first in command of the fort from Hugh Mercer.

29. Young, "The Construction of Pulaski," 43.

30. *Fort Pulaski National Monument Guidebook 1940*, "The Beginning of the War Between the States."

31. Eldridge, "Bricks Versus Earth," 43-44.

32. Herbert M. Schiller, *Sumter is Avenged: The Siege & Reduction of Fort Pulaski* (Shippensburg, PA: The White Mane Publishing Company, 1995), 5.

Mercer was promoted to Brigadier General and placed in charge of the Military District of Georgia.³³

Soon after, the rebels abandoned a small sand fort on Tybee Island, because the post was deemed too difficult to defend due to its isolation from Fort Pulaski's guns. Tybee is approximately 1,700 yards away from Cockspur Island and is surrounded by the Atlantic Ocean, the mouth of the Savannah River, and intracoastal mudflats and marshes. At the time, it was considered too far away to be defensible by Fort Pulaski, as smooth-bore guns only had a range of 700 to 1,000 yards, and there was no dry path for infantry reinforcements to help the post if needed. A few days after it was abandoned, Union ships carrying troops appeared and landed at Tybee with little resistance.³⁴ They quickly proceeded to build eleven batteries there.³⁵ The reason Brigadier Gen. Gillmore attacked Fort Pulaski from Tybee Island, instead of mounting a naval assault, was because cannons on ships were difficult to aim due to the rocking of the ocean. This resulted in a need to move closer to a target to become more accurate, except this put the ship in better range of the fortification's guns.³⁶ Gillmore was counting on a new technology to tip the balance of firepower in his direction.

The Union also set up batteries on Jones, Bird, and Long Islands around Cockspur Island. The Union had been in the area since January of 1862. Around February 11, the

33. Charles H. Olmstead, *Collections of the Georgia Historical Society: The Memoirs of Charles H. Olmstead*, Vol. 14, ed. L. M. Hawes (Savannah: Georgia Historical Society, 1964), 87.

34. Frederic Denison Shot and Shell: The Third Rhode Island Heavy Artillery Regiment in the Rebellion, 1861-1865 (Providence: J. A. & R. A. Reid, 1879), 67.

35. Historic American Buildings Survey. *History of Fort Pulaski and Cockspur Island. Addendum to Fort Pulaski*, HABS No. GA-2158 (Washington, D.C.: Department of the Interior, 1998), 10.

36. Eldridge, "Bricks Versus Earth," 22.

Union Army completed construction of Battery Vulcan on Jones Island, and on February 20 Battery Hamilton on Bird Island. The Union now held battery positions to the north and west of Fort Pulaski.³⁷ Shortly after the completion of the first two batteries, Gillmore ordered a mortar battery built on the very east end of Long Island, the closest to the fort. Located among the marsh grass, sitting either right in the mud or on spits of sand along the shore, these batteries were the closest high land to Cockspur Island besides Tybee, although none were expansive enough to maintain a large number of troops. Union gunboats positioned themselves near Wilmington Island, southeast of the fort, in an attempt to cut off boats traveling between Pulaski and Savannah.³⁸ Battery Vulcan on Venus Point succeeded in stopping Savannah supply ships from reaching the fort.³⁹

Because of these installations, the Confederates sent letters and communications in small boats versus the large steamers attempting to bring them supplies.⁴⁰ The Union's two river batteries made life difficult for the soldiers at Fort Pulaski, but they could not cut them off completely. The Savannah River still allowed skilled blockade runners to get to Savannah and run supplies to the seacoast fort. The surrounding water that the Union thought would help make Pulaski an easier siege target was the same that allowed the Confederates to get supplies. If the fort had been landlocked, then an opposing army

37. See Appendix C. for a map of Union Batteries on Tybee Island.

38. Lemeul Wilson Landersshine, *Landersshine Account of the Siege and Reduction of Fort Pulaski, Georgia*, Diary (Washington, DC: National Park Service, 1929), National Park Service, Fort Pulaski National Monument Archives, entry Jan 27th 1862.

39. Alonzo Williams, "The Investment of Fort Pulaski," in *Personal Narratives of Events in the War of the Rebellion, Being Papers Read Before the Rhode Island Soldiers and Sailors Historical Society* 3, no. 20 (Providence: The Society, 1887), 42.

40. Landersshine, *Landersshine Account*, entry March 19.

could have created a physical and continuous barrier between the fort and their much-needed supplies. However, Pulaski's location on Cockspur Island along the mouth of the Savannah River meant that an opposing army could only occupy whatever dry land was available nearby. This prevented the Union from being able to completely isolate the Confederates, thus allowing them to still get supplies from smaller ships able to run past the batteries.

In the days leading up the battle, Gen. Robert E. Lee visited Col. Olmstead at Pulaski to check on the fort's preparations. Upon seeing the Union's encampment at Tybee Island, Lee told Olmstead, "They will make it pretty hot for you with shells, but they cannot breach your walls at that distance."⁴¹ It was a common belief during this time that masonry forts were indestructible from attacks by sea, and that their only weakness was a land-based assault.⁴² Lee and others were not concerned about the Union's position on Tybee, because they thought that the fort was out of range of the post's cannons. They would have been correct if the Union had not been using its new 30-pound Parrot guns that had a range of 6,000 yards, more than enough to cover the 1,700 yards across the intracoastal plain to the masonry fort.⁴³ Unlike the smoothbore artillery commonly in use, Parrot guns had rifling in the barrels which allowed the projectiles to travel further with a higher velocity. The siege of Fort Pulaski was the first time that Union troops used rifled artillery against a fortification.

41. Olmstead, *Collections of Georgia Historical Society*, 91.

42. Eldridge, "Bricks Versus Earth," 21.

43. Q. A. Gillmore, "General Gillmore's Report to Gen. Totten, Chief Engineer U.S.A.," *Papers on Practical Engineering No 8: Official Report to the United States Engineer Department of the Siege and Reduction of Fort Pulaski. April 30th, 1862*, 45-50.

After sending an official demand to surrender, which Col. Olmstead refused, Capt. Gillmore began shelling the fort on April 10, 1862. The rifled artillery made quick work of the masonry fort and its cannons. By nighttime, half of Pulaski's cannons that were aimed towards Tybee were incapacitated and the South East Angle of the fort was completely caved in. Around 2 o'clock, a well-aimed shell exploded in the walkway to the main powder magazine, sending men running for their lives. With his munitions precariously exposed, Col. Olmstead realized that one more hit could explode the hundreds of pounds of black powder ordnance within. Col. Olmstead ordered that the white flag be raised above the fort and decided to negotiate the terms of surrender rather than risk having the entire fort destroyed.⁴⁴ After the war, a group of Confederate veterans considered the new rifled technology to be "the embodiment of martial power and precision."⁴⁵

Prisoners at Pulaski

After the surrender, the Union occupied the fort until the end of the war. The coastal landscape continued to be militarily advantageous to the Union as part of the Anaconda Plan to cut off southern ports. Sailors and soldiers at Fort Pulaski attempted to prevent blockade runners from reaching Savannah. Confederates would not return to Fort Pulaski until October of 1864 when a group of 520 officers became prisoners there. Originally totaling 600 people from Fort Delaware, they named themselves the "Immortal Six Hundred." Federal Secretary of War Edwin M. Stanton sent the group from Fort

44. Olmstead, *Collections of Georgia Historical Society*," 97-98.

45. Charles Colcock Jones, "Military Lessons Inculcated on the Coast of Georgia During the Confederate War" (speech, The Confederates Survivors' Association, Augusta, Georgia, April 26, 1883).

Delaware to Fort Morris, South Carolina, in retaliation, because U.S. Gen. J. G. Foster had learned of Confederate Gen. Samuel Jones using Union officers as a human shield in Charleston.⁴⁶

The natural barrier of the Savannah River undoubtedly played a role in the decision. An island is the perfect place to create a prison because escape is more difficult. A precedent for this exists in Florida, where during the Seminole Wars, the U.S. government used two Third System forts as prisons for captured American Indians.⁴⁷ Pulaski's location on Cockspur Island, with the Savannah River to the north and west, the Atlantic Ocean to the east, and Bull River to the south, and intracoastal marshes in all directions, provided a convenient way to corral prisoners and limit their escape.⁴⁸ Even strong swimmers would have found it difficult to swim against a strong current in their deteriorating physical state due to subsisting on "retaliation rations" consisting of molding cornmeal and expired pickled onions.⁴⁹ Many of the officers were extremely weak and ill, which would have prevented them from successfully swimming up the river to Savannah or into the Atlantic Ocean. An alternative with a higher probable escape rate would be to commandeer a small watercraft to the marsh and then walk along it until finding freedom.

46. Lattimore, *Fort Pulaski -- Georgia*, 38-39.

47. Walsworth, "Sea Level Rise and Climate."

48. The river's strong current of three knots made it unlikely that any prisoner would be able to swim upriver to Confederate-held Savannah. Ruby A Rahn, *River highway for Trade, The Savannah: Canoes, Indian Tradeboats, Flatboats, Steamers, Packets, and Barges* (Savannah: US Army Corps of Engineers, 1968), 21, 87.

49. Lattimore, *Fort Pulaski—Georgia*, 40.

There is one confirmed account of men escaping Fort Pulaski this way. On February 18, 1865, Maj. W. E. Stewart of the 15th Arkansas Regiment and Lt. Wm. H. Hatcher from an unknown Virginia Regiment snuck out of the prison hospital the night before being sent back into the stockade. They feared that they would die from the elements in their weakened state if they went back into the fort. After escaping, the two men found a small canoe which they rowed past a guard and a Union gunboat. After almost being swept out to sea by the Savannah River, they abandoned the canoe and began to journey by foot across the marsh. The Lowcountry landscape proved to be disorienting to them, as the men became lost in the marsh. They debated whether they were on one of the islands off the coast or in mainland South Carolina. Eventually, the men made their way to Augusta where they were conscripted back into the service of the Confederate Army.⁵⁰

On March 5, 1865, the Immortal Six Hundred were sent back to Fort Delaware. After the war, the fort served as a prison for more Confederate officers. During Reconstruction, it functioned as a prison for deserters from the Union Army who had hidden in Georgia.⁵¹

50. W. E. Stewart, "Account of Escape from Fort Pulaski, by W. E. Stewart, Easton, Maryland," in *The Immortal Six Hundred: A Story of Cruelty to Confederate Prisoners of War*, ed. Ogden Murray (Virginia: The Stone Printing and Manufacturing Co., 1911), 240.

51. Historic American Buildings Survey, *History of Fort Pulaski and Cockspur Island*, 11.

The Fort's Fate Post-Civil War

The Retirement of Fort Pulaski

The U.S. Army continued to occupy the fort until 1873, making much-needed renovations to Cockspur Island and repairs to the installation.⁵² The U.S. Army Corps of Engineers created plans for a new fort on Tybee Island because it was deemed to have a better advantage point due to its position facing the Atlantic Ocean.⁵³ Fort Pulaski's position on Cockspur Island was ideal for defending the mouth of the Savannah River, but the fort itself was proven ineffective against rifled artillery. After the Civil War, Congress reported that masonry forts could be reinforced with iron plating, but after two failed experiments at Fort Monroe and Fort Delaware, they determined that this was ineffective.⁵⁴

The same Congressional report stated that in addition to being prone to destruction by rifled artillery, the cannons of Third System forts were unable to prevent ironclads from invading the harbors they protected.⁵⁵ This new type of ship had a shallower hull and steel or iron plate armor. This meant that the advantages of Cockspur Island dwindled. The shallow river estuary that prevented older ships from getting within firing range of Fort Pulaski no longer hindered the new ironclads. The fort failed to deter

52. William Belknap, "Letter from Quartermaster Gen. Belknap, Secretary of War, to Maj. Gen. Henry Halleck, Adj. Gen, 4 December 1869" (Letter, Georgia State Historic Preservation Office, Atlanta, GA); Historical American Buildings Survey, *History of Fort Pulaski and Cockspur Island*, 14.

53. Faith J. Meader, *Fort Pulaski National Monument Administrative History*, ed. Cameron Binkley (National Park Service: Cultural Resource Division, 2003), 13.

54. Eldridge, "Bricks Versus Earth," 67.

55. The Second Session of the 37th Congress issued two reports titled "Permanent Fortifications and Seacoast Defense" and "Changes of material and Construction of Forts" about the current status of Third System defenses and how to improve them to make them competitive with the new warfare technologies.

blockade runners too. To pass upriver, any ship would have to get within range of the fortification's guns, usually ending in disaster for wooden ships. However, ironclads could withstand the volleys and with their steam-powered engines proceed up the river to Savannah. In addition, the U.S. government wanted a fort that directly faced the ocean and foreign threats, instead of one further inland. Thus, Fort Pulaski was officially closed on October 25, 1873, except for an Army ordnance sergeant and a caretaker.⁵⁶

On June 27, 1884, the U.S. Army Corps of Engineers became responsible for the retired fort and island.⁵⁷ Col. Gillmore of the USACE, the same who captured the fort in 1862, surveyed Cockspur Island as he helped make plans to improve the navigability of the Savannah River.⁵⁸ Dredging began in the harbor area near Fort Pulaski to accommodate larger cargo ships as the port increased in size and volume of ship traffic. The unique characteristic of being in a shallow river estuary was no longer a useful military defense. But with the invention of ironclads and the retirement of Fort Pulaski from active military service, the United States was focused on growing its commercial prospects after the Civil War.

The United States was not worried about conflict again until 1898 when the Spanish-American War started after the sinking of the USS *Maine*. Capt. Cassius Gillette, of the US Army Corps of Engineers, submitted plans for Battery Horace Hambright to be built on the north end of the island. This location was about a quarter of a mile away from

56. Meader, *Fort Pulaski Administrative History*, 13.

57. *Preliminary Inventory of the Records of U.S. Army Continental Commands, 1821-1920*, Volume IV, Military Installations, 1999, RG 393. National Archives, Washington, D.C.

58. Quincy A. Gillmore, *Col. Gillmore to Capt. Thomas Baily, 5 December 1884*, Letter (Atlanta: Georgia State Historic Preservation Office), National Park Service, Fort Pulaski National Monument Archives.

the deserted Fort Pulaski. The battery served as a control center for the mines placed at the mouth of the Savannah River.

Completed in 1900, Hambright was a concrete and earthen Endicott System fort built out of a fear that the Spanish would invade America's waterways.⁵⁹ Endicott System forts replaced the Third System forts as war tactics and technologies advanced. Endicott System defenses were not built like traditional forts. Instead, they were batteries with a few large guns placed in strategic locations. Many had disappearing gun carriages, allowing the cannons to hide out of view from attacking ships while being reloaded.⁶⁰

Although the Spanish never invaded, Cockspur Island proved itself again as a strategic military position for a fortification at the mouth of the river with the updated Endicott Era forts, replacing the outdated Third System. Despite the drawbacks of Fort Pulaski, the USACE still chose Cockspur Island for the location of the new battery, showing how the island's location still had a strategic advantage.

Savannah's River Guardian in Shambles

By the turn of the twentieth century, Fort Pulaski was in a state of disarray. Without continued maintenance, the masonry walls started to crumble. The dikes were in such a poor state that they were no longer able to properly control the flow of the tidal water.⁶¹ The system filled with sediment from the river and would cause previously dry land to be submerged. Sea levels started to rise during the 1850s due to coal increasingly being burned to run steam engines. Coastal areas were the first to be negatively

59. *Fort Pulaski National Monument Guidebook 1940*.

60. Jamie W Moore, *The Lowcountry Engineers: Military Missions and Economic Development in the Charleston District, U.S. Army Corps of Engineers* (Shelby Township: The District, 1982), 50-60.

61. Hitchcock, *Cultural Landscape Report*, 47.

affected.⁶² Cockspur Island faced erosion from daily tides and the current of the Savannah River, further stripping away what little dry land was left. Another problem was that Third System forts suffered from mortar loss due to the salt in the water and air.⁶³ Without the USACE stepping in and implementing procedures to combat this, the Savannah River and the Atlantic Ocean would have begun to reclaim Cockspur Island.

The Quarantine Station

While Fort Pulaski deteriorated from neglect after the construction of Battery Hambright, in May of 1889, the War Department granted to the City of Savannah a new quarantine station on the island. It included the quarantine officer's cottage, housing for the crews of quarantined ships, and a disinfecting plant.⁶⁴ Its purpose was to isolate the ships coming into the Port of Savannah to prevent any infectious diseases from making their way inland. Despite many of the buildings being on wooden and masonry stilts, officers made continued requests for dredged materials to further increase the height of the station from sea level.⁶⁵ These appeals show that flooding was a concern of the officials who worked there. The fort itself is only 6.92 feet above sea level, while Savannah is 49 feet above sea level.⁶⁶ The worsening dike system would have contributed to their fears as well since it could no longer properly drain the island. Throughout its

62. The Ocean Portal Team. "Sea Level Rise." Ocean.si.edu. Smithsonian Institute. Accessed February 24, 2021.

63. Walsworth, "Sea Level Rise and Climate."

64. Historic American Buildings Survey, *History of Fort Pulaski and Cockspur Island*, 17.

65. Ibid.

66. "Fort Pulaski, GA - Station ID: 8670870," Tidesandcurrents.noaa.gov, National Oceanic and Atmospheric Administration, accessed on Jan 14, 2021, <https://tidesandcurrents.noaa.gov/stationhome.html?id=8670870#>.

settlement, Cockspur has been prone to floods. Its Lowcountry landscape is essentially at sea level, placing it at the mercy of incoming tides, storms, and hurricanes.

The National Park Service and the New Deal Programs Arrive

The War Department declared Fort Pulaski a National Monument on October 15, 1924, by the presidential proclamation of Calvin Coolidge. Because it was no longer in military service, the War Department transferred control to the National Park Service (NPS) on August 10, 1933.

Around the same time, the Civilian Conservation Corps (CCC) was created as part of President Franklin Roosevelt's New Deal to stimulate the economy and lower unemployment rates during the Great Depression. Authorized by Executive Order 6101, the program aimed to employ 250,000 men by July 1933. Single young men between the ages of eighteen and twenty-five were recruited to do labor for the National Park Service and the U.S. Forest Service to keep them occupied and off the streets.⁶⁷ The NPS had recently acquired historic sites and retired forts, in addition to creating national parks along the eastern seaboard, in an attempt to reach more Americans, because the majority of the United States population lived on the East Coast at a time when many NPS sites were out west.⁶⁸ Aiming to bring in more visitors, the NPS needed these new locations to be renovated and restored. This is where the CCC came in, occupying idle hands to create something fresh.

67. "CCC Brief History," CCCLegacy.org, CCC Legacy, accessed on February 4, 2021, http://ccclegacy.org/CCC_Brief_History.html.

68. Lance Hatton, interview by Armstrong Oral History Class, *Civilian Conservation Corps (CCC) Oral History Interviews*, National Park Service, Fort Pulaski National Monument, 2000, 21:00.

In May 1934, the CCC established Camp 460 on Cockspur Island. Approximately 175 young men set to work doing mainly landscaping to make the fort suitable for visitors.⁶⁹ Due to Pulaski's neglect after the Spanish-American War, the fort made a perfect location for the CCC to send workers. Their landscaping efforts included rebuilding the dike system and moat. The men had to work to reclaim the island back from the water.

Not only were the ditches and dikes important for stabilizing the heavy masonry fort, but they also played an important role in mosquito control. Standing water around the fort impacted its maintenance and general usefulness due to mosquito propagation. The humid, subtropical climate of South Georgia allows mosquitos to thrive almost year-round. One feature labeled Ditch No. 2, became a mosquito breeding ground due to the inability of the ditch to drain because of the built-up sediment. It was repaired in 1934 and 1935 but continued to have drainage problems because of tidal mudslides from the sides of the ditch.⁷⁰ Despite their best efforts, the young men struggled with the marsh landscape's incompatibility with their renovation efforts. Issues like this one show how difficult working in the marsh was for the CCC. Mosquitos were in abundance in the southeastern United States and had caused previous issues at Fort Pulaski. When building the fort, workers took furloughs during the summer months due to malaria.⁷¹

69. See Appendix D. for images of Fort Pulaski during CCC work after a storm; Meader, *Fort Pulaski Administrative History*, 26.

70. *Job 108 Justification for Ditch No. 2 at Fort Pulaski National Monument*, 1939, Box 47, Folder 20, Fort Pulaski National Monument Archives, Savannah, Georgia, 1.

71. Eldridge, "Brick Versus Earth," 33.

In the interest of making the fort suitable to visitors, the ditches had to be operational to prevent not only mosquitos from breeding but also the fort grounds from flooding during storms. According to park historian Ralston Lattimore, the parade ground had been flooded with four or five feet of water after a particularly bad storm.⁷² To combat this from happening again, Acting Superintendent Reaville Brown suggested the dikes be raised from their original historical height.⁷³ Just like the officials at the quarantine station, those in charge of the fort were concerned about possible flooding. The low-lying location of Pulaski was a danger to its preservation. The older the fortification became; the more water posed a threat to its existence.

Because the NPS's mission statement is to preserve "the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations," a similar New Deal Program to the CCC, the Public Works Administration (PWA) built new structures to accommodate the influx of people. One of the projects was the bridge that connects Fort Pulaski National Monument to US 80 from Savannah. The half-mile long bridge crosses over the river's south channel connecting Cockspur to McQueen's Island. Before the bridge, the young men would ride a boat across the Savannah River from Lazaretto Creek to Cockspur.⁷⁴ Despite the

72. *Correspondence from Oliver Taylor to Reaville Brown June 28, 1935*, Box 47, Folder 19, Fort Pulaski National Monument Archives, Savannah, Georgia.

73. *Correspondence from Reaville Brown to Oliver Taylor June 26, 1935*, Box 47, Folder 19, Fort Pulaski National Monument Archives, Savannah, Georgia.

74. Armstrong Oral History Class, "Interview with Wilbur Johnson" (2000). *Civilian Conservation Corps (CCC) Oral History Interviews*. 6. <https://digitalcommons.georgiasouthern.edu/ccc-pulaski-oral-histories/6>, 43:45.

ongoing preservation and construction work, visitors were also able to access the site through an NPS-run ferry in the fall of 1934.

Due to these ferries, the isolation of Fort Pulaski began to dwindle. It did so even more once the construction of the bridge was completed in April 1938. Consisting of wood and concrete, it took approximately a year from start to finish. The bridge provided easier access for tourists, causing attendance numbers to more than quadruple from 12,471 in 1937 to 50,883 in 1938.⁷⁵ The bridging of the Savannah River helped change the meaning of the site. As Pulaski lost its military advantage, it gained an audience of visitors interested in learning about America's coastal defense history. Its changing purpose allowed it to be preserved, instead of being forgotten. Instead of serving a purpose in war, the landscape educates millions of visitors every year about Georgia's coastal history.

Fort Pulaski Gets A Navy

On September 1, 1939, World War II began when Germany invaded Poland. Despite the conflict not being brought stateside until the end of 1941, the United States was manufacturing weapons, ammunition, and other war supplies to lease to its allies via the Lend-Lease Act in 1941.⁷⁶ Savannah's port was important in shipping these goods overseas. Approximately 200,000 tons of bombs and weapons and 300,000 tons of other war materials traveled through the Port of Savannah to aid Britain.⁷⁷ While U.S. eastern

75. Meader, *Fort Pulaski Administrative History*, 36.

76. "Today in History- October 23: The Lend-Lease Act," Loc.gov, The Library of Congress, accessed on March 9, 2021.

77. Luciana Spracher, *World War II on the Savannah Waterfront in the American Theater of Operations: Wartime Production and Service in Savannah*, Savannah, GA: City of Savannah Research Library and Municipal Archives, 2008, 307-308.

ports were shipping war goods en masse, Germany realized that the United States was not remaining a neutral party. It ordered U-boats to fire upon any ships suspected of carrying materials to help the Allies.

This posed a threat to ships sailing in and out of the port. *The Savannah Evening Press* announced on November 19, 1941, that Section Base #20 on Cockspur Island was to protect the city and the military assets at the port from German U-boats.⁷⁸ Between 1942 and 1946, the national monument was closed to visitors while roughly 200 navy personnel were stationed there.⁷⁹ Sailing locally built minesweepers, the men would check for possible mines placed by the Germans targeting cargo ships. Although Cockspur was considered militarily advantageous due to its deep-water access, that same characteristic provided the perfect concealment for U-boats. They were most effective against enemy commercial ships carrying supplies to the Allies. Coastal communities in the U.S. were not under mandatory blackouts like their allies in Europe.⁸⁰ This made it easy for an enemy to spot the city and port at night.

Fortunately, a U-boat never attacked the city. Despite five U-boats roaming off the Atlantic Coast in December 1941, only one was ever sighted during the Navy's occupation of Cockspur.⁸¹ On July 13, 1942, the USS *Avenge* minesweeper tracked the

78. U-boat is the shortened version of the German word for submarine, Unterseeboot. This shortened word is often used by English speakers to specifically refer to German submarines during the First and Second World Wars. Lt. Cmdr. Robert P. Erdman, USN, "Navy Pushes Program to Protect Port; Naval Ships Be Built Here," *Savannah Evening Press*, November 19, 1941.

79. Duncan S. Ballantine, *U.S. Naval Logistics in the Second World War* (New Jersey: Princeton University Press, 1947), 46.

80. Anna Louise McIntyre, "U-Boats on the Horizon: Cockspur Island's Involvement in World War II" (master's thesis, Georgia Southern University, 2019), 12.

81. Theodore R. Treadwell, *Splinter Fleet: The Wooden Subchasers of World War II* (Maryland: Naval Institute Press, 2000), 30.

periscope of a submarine for four minutes, two miles away from the Savannah Lightship.⁸² Over the next twenty-two hours, men from Section Base #20 continued to patrol for the U-boat. Contact was never made again after the initial sighting. It is unknown how many times the Germans lurked just outside of Savannah, but this sighting shows how easy it was for these submarines to slip into the ocean and become concealed by the waves and water.

After the war, control of Fort Pulaski National Monument returned to the National Park Service. The U.S. Navy decommissioned Section Base #20 in 1944 and the national monument was reopened to visitors in 1947. During the Navy's five-year occupation, Fort Pulaski once again fell into disarray. Although not as bad as after the first abandonment, the fort's parade ground was overgrown with vegetation and the island drainage systems were failing from neglect. Only one maintenance worker, Jack Hood, had been allowed onto the island to care for the fort. One man was not capable of maintaining everything though. Without sufficient maintenance of the dikes, water was able to engulf the land. The fort's location on a marsh island resulted in a constant battle between man and nature. The USACE and the NPS would repair the dike system, only for time or hurricanes destroy them. This has caused ongoing maintenance issues at the national monument site.

82. A lightship is a ship that is used as a lighthouse in waters too deep for an actual one. McIntyre, "U-Boats on the Horizon," 16.

Pulaski Returns to the National Park Service

Hurricanes Wreak More Havoc

A destructive hurricane on October 15, 1947, closed Fort Pulaski for approximately two months. According to Superintendent Ralston B. Lattimore, the dike system suffered the most, with a quarter of the 19,000 feet of dikes damaged. The remainder of the month had to be spent fixing the destruction. In the worst spot, the dike had been completely washed away. This resulted in the flooding of up to 10.87 feet in some areas.⁸³ The parade ground had flooded, as well as the officer's quarters in the fort. The parking lot suffered cracks and started to crumble from the saltwater being unable to drain after it sat on the pavement for forty-eight hours.⁸⁴ Hurricanes like this one showed how susceptible Cockspur Island is to water-caused damage.

Mission 66

The period during and after the war saw National Park sites neglected. The young men that worked as rangers were drafted to fight, and money was directed towards producing war supplies instead of enhancing visitors' experiences. The parks were in such a poor state, that NPS Director Newton Drury called them "victims of the war" in 1949.⁸⁵ To restore their parks, the NPS created "Mission 66" in 1956. It was to be a ten-year program that used Congressional funds to renovate sites, build administration and maintenance buildings, and create trail systems. A cornerstone of Mission 66 was the

83. Angela Fritz, "Historic High Tides from Supermoon and Sea Level Rise Flood the Southeast Coast," *The Washington Post*, [Washingtonpost.com](https://www.washingtonpost.com), accessed on January 28, 2021.

84. *Ft. Pulaski Superintendent Report by Ralston Lattimore*, October 1947, Box 4, Folder 21, Fort Pulaski National Monument Archives, Savannah, Georgia.

85. Meader, *Fort Pulaski Administrative History*, 29.

construction of visitor centers, creating a centralized point for guests to use facilities and learn about the park.⁸⁶

Fort Pulaski's Mission 66 Master Plan included "first priority" repairs to the dike system and island drainage.⁸⁷ This involved digging 2,200 feet of new dikes and clearing 2,700 feet of the older dikes. By 1963, NPS workers had excavated 7,000 feet of ditches by hand and new tide gates were installed to allow for water to drain from the island.⁸⁸ Making sure the island had proper drainage was important in preventing Fort Pulaski from being taken back over by the Savannah River. As the fort aged, its location had become obsolete from a military standpoint due to technological advancements. Its sole purpose evolved into being a historic site, with humans continuing to bolster Pulaski by re-digging the dikes and ditches every ten or so years. Despite the constant reconstruction of the dikes, Cockspur Island continues to be eroded by nature and man-made activity. Wake from boats passing by in the Savannah River slowly pull away at Pulaski's sandy foundation. Hurricanes and tropical storms also put Pulaski at risk. Some have caused minor damages, while others have caused destruction that would be extremely costly.⁸⁹

86. Ibid.

87. *Mission 66 Final Prospectus*, 1956, Box 19, Folders 1 & 2, Fort Pulaski National Monument Archives, Savannah, Georgia.

88. Meader, *Fort Pulaski Administrative History*, 31.

89. Rick Kanaski, interview by Molly Samuel, *How Sea Level Rise Threatens Our History*, WABE: Where ATL meets NPR, September 10, 2018.

Nature vs. Fort Pulaski

Hurricane Matthew (2016) and Tropical Storm Irma (2017)

Hurricane Matthew arrived off the coast of Savannah on October 7, 2016. It caused severe damage to the coastal outskirts of the city despite never making landfall. Fort Pulaski saw an almost eight-foot storm surge, with flooding after the storm reaching twelve and a half feet high.⁹⁰ Fortunately, many of the park's resources were moved to Fort Frederica on Saint Simons Island, Georgia, prior to the storm. A large part of Cockspur Island was left underwater after the storm had passed, and the dike system was damaged and washed out.⁹¹ The flooding had brought a foot and a half of debris-filled water into the officer's quarters and other rooms within the fort. This high water also lifted the wooden boards in the casemates and dislodged a bridge to one of the sally ports. The bridge was found a quarter of a mile away, by a staff member using Google Maps.⁹²

This damage caused the fort to be closed from October 5 to November 6, 2016. As the flood waters receded, the centuries-old masonry walls started to crack.⁹³ To mitigate any future damage and to repair the destruction that already occurred, the National Park Service deployed the Eastern Incident Management Team. This team was made up of first responders, historic preservationists, workers trained in historical architecture and masonry, and more. Their main goal is to safely secure the site, preserve

90. "Fort Pulaski: The Story of the Storm & the Road to Reopening," *Welcome to Savannah Georgia*, Savannah.com, accessed on February 26, 2021.

91. See Appendix E. for an image of Fort Pulaski flooded in the aftermath of Hurricane Matthew.

92. Molly Samuel, "How Sea Level Rise Threatens Our History," *WABE: Where ATL meets NPR*, (2018), accessed on Jan 24, 2021.

93. Brittini Ray, "Fort Pulaski Closed Indefinitely Until Experts Can Assess Repairs, Ensure Safety After Storm," *Savannah Morning News* (Savannah, GA), October 20, 2016.

any historical structures and artifacts, and bring the site back to working order.⁹⁴ Due to their work, the site finally reopened to ranger-led only tours on November 7, 2016.

Less than a year later disaster struck again. Tropical Storm Irma hit Savannah on September 11, 2017. Irma caused even more flooding than Matthew, turning famous River Street in downtown Savannah into an actual river. The highest water level on Cockspur Island was over twelve feet.⁹⁵ Irma caused identical damage to Matthew. The parade ground was once again washed out as the dikes were unable to slow the rush of water overtaking Cockspur. Aerial photos show just how severe the flooding was.⁹⁶

Irma costs the park service \$750,000 in damage to the fort from flooding and debris. According to Joel Cadoff, the Chief of Interpretation for Fort Pulaski National Monument, the two storms caused \$3 million in total in clean-up and repairs to the fort.⁹⁷ Cadoff told a local news station that “there is a planned conversation with the National Park Service about altering infrastructure to help prevent severe flooding damage in the future.”⁹⁸

One month after Irma, Pulaski opened with limited access to visitors. The Lighthouse Overlook hiking trail is closed through Spring 2021 due to damage from the storms. The project is a little over three years long and will cost \$600,000 to replace

94. National Park Service, "Incident Management Program Reference Manual-55" (Washington, D. C., 2014), 5.

95. Dash Coleman, "Savannah's Fort Pulaski Undergoing Repairs after Irma Damage," *Savannah Now* (Savannah, GA), September 15, 2017.

96. See Appendix F. for images of Fort Pulaski in the aftermath of Hurricane Irma.

97. WSAV, "Fort Pulaski Reopens After Irma, Overall Storm Damage Costing Millions," WSAV (Savannah, GA), October 10, 2017.

98. *Ibid.*

bridges that floated away and remove the debris left by the heavy winds and flood waters.⁹⁹ At the time of this thesis, the trails are still closed.

Sea Levels Are Rising

Flooding from hurricanes is not the only concern of Fort Pulaski. Sea level rise is a threat that gets more destructive every year. Levels have already risen over nine inches since 1935, with an expected six more inches within the next fifty years at Cockspur Island.¹⁰⁰ A lack of drainage has a serious impact on the fort, as it “increases mold, dampness, and standing water, all of which lead to rot and waterlogged vegetation.”¹⁰¹ This would result in damage to Pulaski’s masonry walls, centuries-old wood, and historic dike system.

Sea level rise is already affecting Third System forts on the Gulf Coast as well, with Louisiana’s forts currently being in imminent danger. Years of human activities such as oil drilling, dredging, and deforestation have damaged the local wetland landscape, resulting in an unstable foundation for many of Louisiana’s masonry forts. Like Cockspur Island, the locations of these forts were not very stable to begin with.¹⁰²

Rising sea levels threaten the islands that this system was built on, meaning that they may not be around for much longer. While the locations of Third System defenses were vital to their success, they are also becoming their downfall. Locations like Fort

99. Cadoff, Joel, "Park Begins Projects to Improve Visitor Experience," *National Park Service*, U.S. Department of the Interior, accessed March 20, 2021. <https://www.nps.gov/fopu/learn/news/fopunr20-1.htm>.

100. "Climate Change," *National Parks Service*, U.S. Department of the Interior, accessed February 26, 2021, <https://www.nps.gov/fopu/learn/nature/climatechange.htm>.

101. Ibid.

102. Walsworth, "Sea Level Rise and Climate."

Pulaski are at continued risk from destruction by hurricanes and rising water levels. Eventually, some of these sites may become completely underwater, resulting in a loss of history and science to society. The NPS uses vulnerability assessments to decide which sites are at an increased risk for damage and loss of cultural resources.¹⁰³

Conclusion

Water has played a pivotal role in the history of Fort Pulaski and Cockspur Island. Since its construction, the fort has been battling the Lowcountry landscape to remain on high ground. While water proved to be a military advantage before the Civil War, as weapons technology advanced, Third System forts were left behind. With the introduction of rifled artillery and ironclads into warfare, island forts became obsolete.

Post-war, the preservation of Fort Pulaski as a historical site has been impeded by water and threatened by the destructive forces of the ocean over the coastal landscape. The fort's location among mudflats meant that a dike system had to be built to drain the marsh. Throughout the years, this proved to be a never-ending task as hurricane after hurricane battered Savannah's river guardian.

Studies like this allow us to understand what role humans may have to play in the future as the preservation of our historic and cultural sites becomes difficult due to their locations and the negative impacts of climate change. The characteristics that made Fort Pulaski unique, such as being located on an island and having a masonry construction, also lend themselves to be the fort's downfall. In different forms, water has attempted to erode the national monument, threatening its existence.

103. *National Parks Service*, "Climate Change."

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Appendix A.



Figure 1. Aerial image of Fort Pulaski, depicting the surround marsh and islands (Google Maps).

Appendix B.

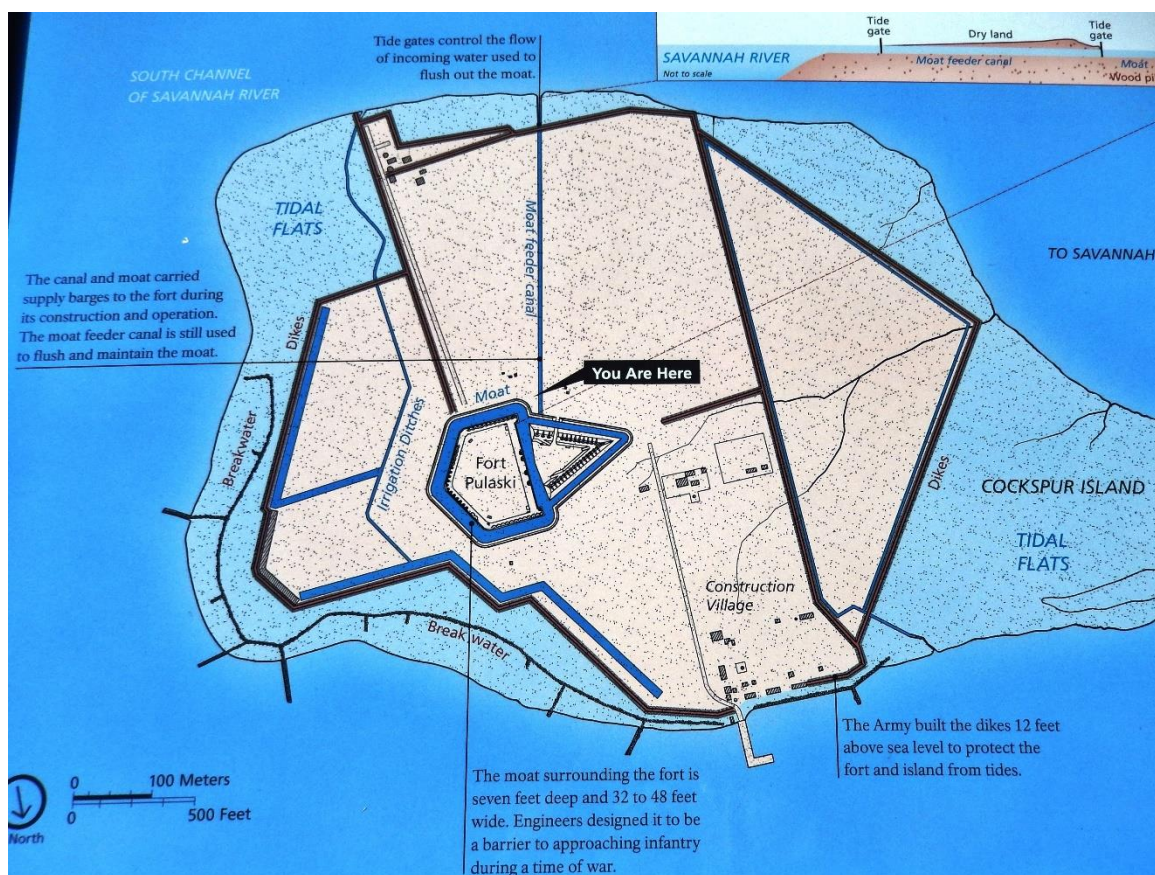


Figure 1. Illustration of the perimeter dike and irrigation ditches around Fort Pulaski (On-site interpretive sign).

Appendix C.

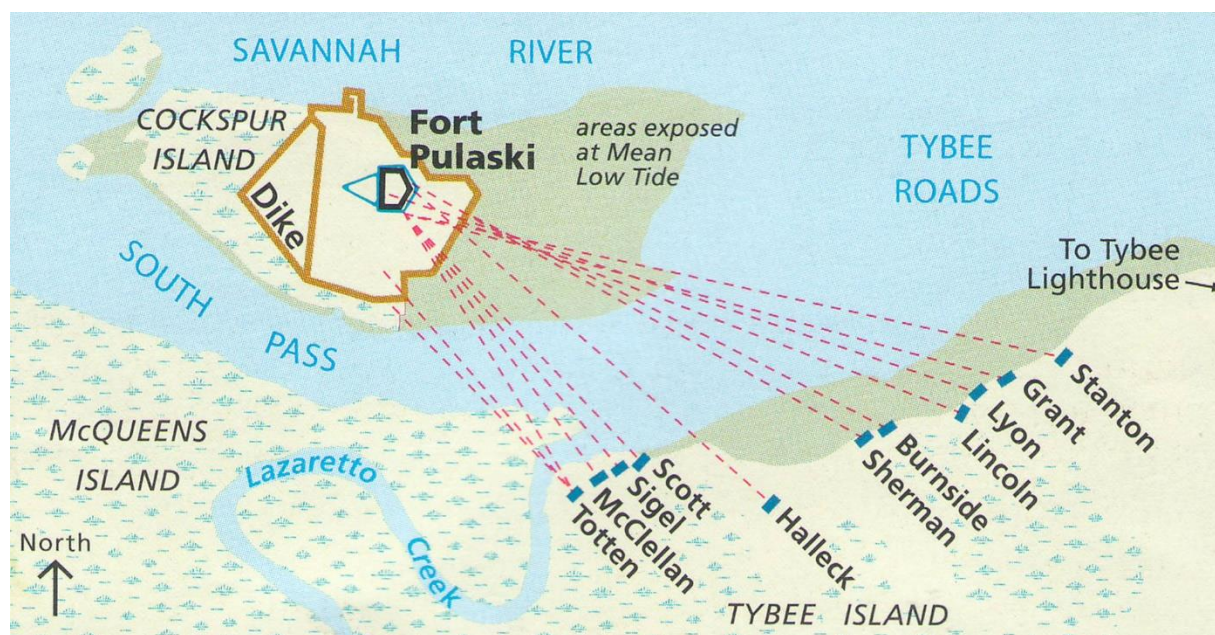


Figure 1. Union batteries on Tybee Island in relation for Fort Pulaski on Cockspur Island (Interpretive sign).

Appendix D.



Figure 1. Flooded parade grounds of Fort Pulaski sometime during the CCC occupation (Box 82_397, Fort Pulaski National Monument Archives).



Figure 2. Flooded parade grounds of Fort Pulaski, possibly mid-storm. Image taken at some point during the CCC occupation (Box 42_415, Fort Pulaski National Monument Archives).

Appendix E.



Figure 1. Aerial photograph from a helicopter depicting the flooding at Fort Pulaski in the aftermath of Hurricane Matthew in 2017 (WTOC).

Appendix F.



Figure 1. Aerial photograph depicting the flooding at Fort Pulaski in the aftermath of Hurricane Irma in 2017 (Chris Compton, AJC).



Figure 2. Flooding at Fort Pulaski covering interpretive signage and a period cannon after Hurricane Irma (Eastern IMT, “091217_Fort Pulaski_Flooding_063”).



Figure 3. Flooding in the casemates of Fort Pulaski after Hurricane Irma (Eastern IMT, “091317_Fort Pulaski_Fort_031”).