Fort Pulaski National Monument
Georgia

National Park Service
U.S. Department of the Interior

Final General Management Plan, Wilderness Study, and Environmental Impact Statement

June 2013

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General Management Plan / Wilderness Study / Environmental Impact Statement
Fort Pulaski National Monument
Chatham County, Georgia

SUMMARY

President Calvin Coolidge established Fort Pulaski as a national monument by proclamation on October 15, 1924, under the authority of section 2 of the Antiquities Act of 1906. The proclamation declared the entire 20-acre area "comprising the site of the old fortifications which are clearly defined by ditches and embankments" to be a national monument.

By act of Congress on June 26, 1936 (49 Stat. 1979), the boundaries of Fort Pulaski National Monument were expanded to include all lands on Cockspur Island, Georgia, then or formerly under the jurisdiction of the secretary of war. The legislation also authorized the Secretary of the Interior to accept donated lands, easements, and improvements on McQueens and Tybee islands in Chatham County, Georgia, for addition to the national monument. Furthermore, the act directed the secretary to construct a bridge or causeway across the South Channel Savannah River from Cockspur Island to McQueens Island as part of the road system of Fort Pulaski and provided for land on the north end of Cockspur Island for the U.S. Army Corps of Engineers to use for dredge spoil and additional land for the U.S. Department of the Treasury to use as a quarantine station.

Executive Orders 6166 of June 10, 1933, and 6228 of July 28, 1933, transferred Fort Pulaski and other military parks, battlefields, and cemeteries from the War Department to the Department of the Interior (National Park Service [NPS]).

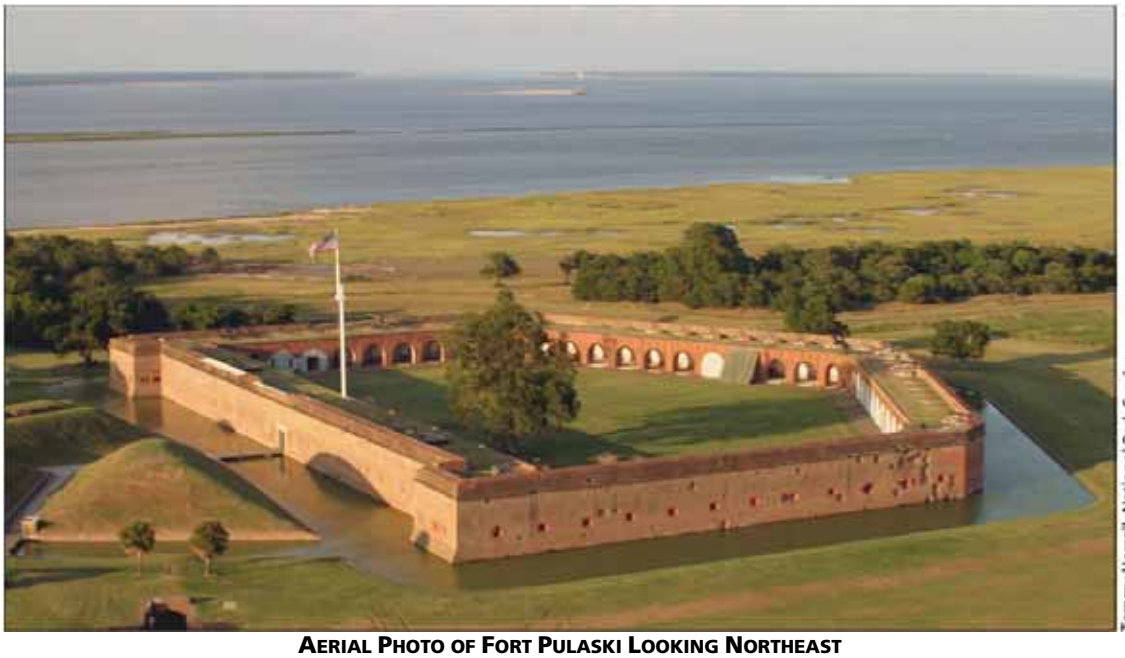
A presidential proclamation on August 14, 1958, transferred two islands from the U.S. Coast Guard to the National Park Service. One contains the Cockspur Island Lighthouse and the other is known as Daymark Island. Finally, in 1996, Congress passed a law that removed the U.S. Army Corps of Engineers' reserved right to deposit dredge spoil on Cockspur Island.

This *General Management Plan / Wilderness Study / Environmental Impact Statement* provides comprehensive guidance for perpetuating natural systems, preserving cultural resources, and providing opportunities for high-quality visitor experiences at Fort Pulaski National Monument. The purpose of the plan is to decide how the National Park Service can best fulfill the monument's purpose, maintain its significance, and protect its resources unimpaired for the enjoyment of present and future generations. It describes the overall path that the National Park Service would follow in managing the national monument during the next 20 years or more.

The document examines three alternatives for managing the national monument for the next 20 or more years and analyzes the impacts of implementing each of the alternatives. Alternative A is the "no-action" alternative, which describes how the national monument is managed now, providing a basis for comparing the other alternatives. Under alternative B, the NPS preferred alternative, Fort Pulaski would be managed to focus on the April 1862 period of significance in terms of the landscape and interpretive programs. This alternative includes landscape restoration and interpretation of the construction village. Under alternative C, the national monument would be managed with a much broader interpretive mandate than in alternative B, to include a wider range of themes and historic periods as well as natural resource themes.

The key impacts of implementing these alternatives are summarized in table 7 and detailed in chapter 4.

This *General Management Plan / Wilderness Study / Environmental Impact Statement* includes letters from governmental agencies, any substantive comments on the draft document, and NPS responses to those comments. The final plan also includes changes and clarifications made to the document in response to comments received. Following distribution of the final plan and a 30-day no-action period, a "Record of Decision" approving a final plan will be signed by the NPS regional director. The Record of Decision documents the NPS selection of an alternative for implementation. With the signed record of decision, the plan can then be implemented, depending on funding and staffing. However, a Record of Decision does not guarantee funds and staff for implementing the approved plan.



Tammy Herrell, National Park Service

AERIAL PHOTO OF FORT PULASKI LOOKING NORTHEAST

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National Park Service

PURPOSE AND NEED FOR THE PLAN

CHAPTER 1: PURPOSE AND NEED FOR THE PLAN

INTRODUCTION

This *General Management Plan / Wilderness Study / Environmental Impact Statement* presents and analyzes three alternative future directions for the management and use of Fort Pulaski National Monument. Alternative B is the National Park Service (NPS) preferred alternative. The potential environmental impacts of all alternatives have been identified and assessed. General management plans are intended to be long-term documents that establish and articulate a management philosophy and framework for decision making and problem solving in the parks. This general management plan will provide guidance for the next 20 years or more.

BACKGROUND

On April 10, 1862, Union batteries opened fire on Fort Pulaski. Within 30 hours the southeastern wall had been breached and the Confederate garrison surrendered. The secret of the siege was the use of rifled cannon by the Union artillery. These new weapons were able to fire their elongated projectiles farther and with more accuracy than the smoothbore cannons that Fort Pulaski was built to withstand. The Battle of Fort Pulaski transformed all the masonry forts built as a part of the Third System of U.S. coastal defense from impenetrable bastions of ingenious engineering to obsolete symbols of American military defense (NPS 2009a).

Fort Pulaski National Monument was established by Presidential Proclamation (Calvin Coolidge) No. 1713 (43 Stat. 1968) on October 15, 1924. The War Department administered the monument until it was transferred to the Department of the Interior, National Park Service, by Executive Order 6166 issued pursuant to the authority of section 16 of the Act of March 3, 1933 (Public Law No. 428-47 Stat. 1517).

An act of Congress (49 Stat. 1979), approved on June 26, 1936, expanded the boundaries of the national monument to include all of the lands on Cockspur Island, Georgia, that were then or formerly under the jurisdiction of the secretary of war. Furthermore, the legislation authorized the Secretary of the Interior to accept donated lands on McQueens and Tybee islands, in Chatham County, Georgia, for addition to the boundary of Fort Pulaski National Monument.

BRIEF DESCRIPTION OF THE PARK

Fort Pulaski National Monument is between Savannah and Tybee Island on the Georgia coast. The site contains 5,623 acres on Cockspur and McQueens islands. Within this insular setting, the monument contains a broad range of significant historic and natural resources.

Fort Pulaski is a well-preserved, massive, brick fortification considered invincible when it was built in the first half of the 19th century. It was one unit in a protective chain of forts planned and built to protect the eastern seaboard cities after the British burned the city of Washington during the War of 1812. The bombardment of Fort Pulaski by rifled cannons during the Civil War resulted in the breach of its “invincible” walls and the surrender of its garrison to Union forces. The success of the bombardment proved that masonry forts could no longer provide an effective deterrent to a coastal assault.

In October 1864, Union troops stationed at Fort Pulaski accepted transfer of a group of imprisoned Confederate officers who later became known as the Immortal Six Hundred. During their incarceration at Fort Pulaski, 13 prisoners died. The dead were buried on-site at Cockspur Island. Most died of dehydration

due to dysentery. In March 1865, prison survivors were sent to Fort Delaware where conditions were somewhat better than at Fort Pulaski.

Other historic resources include the John Wesley Memorial; dikes, ditches, and tidal gates built under the direction of Lt. Robert E. Lee; the Cockspur Island Lighthouse; Civil War era mortar batteries; gun emplacements on the demilune (a triangular piece of land designed to protect the rear of the fort); Battery Horace Hambright, a Spanish-American War era gun emplacement; and the artifacts and documents in the monument's collections and files.

DEMILUNE, MOAT, AND FLAGPOLE

The vast majority of the land comprising Fort Pulaski National Monument consists of nearly 5,000 acres of salt marsh. These tidal marshes, which formed in conjunction with barrier island development, have delicate ecological characteristics including essential life support systems for shrimp, oysters, juvenile fish, and shellfish. Because its appearance has changed little in the last 150 years, the marsh provides the visitor with a historic scene that greatly enhances the appreciation of the fort and the significance of its location as a coastal defense.

Annual recreational visitation to the monument has averaged approximately 339,000 since 1995. The typical peak period of visitation at Fort Pulaski is April through July. The months with the lowest visitation levels are November, December, and January. Most monument visitors participate in day use activities such as viewing exhibits and programs in the visitor center, exploring the fort, walking, fishing, and participating in educational programs.

PURPOSE OF THE PLAN

The approved general management plan will be the basic document for managing Fort Pulaski National Monument for the next 20 years or more. The purposes of this general management plan are as follows:

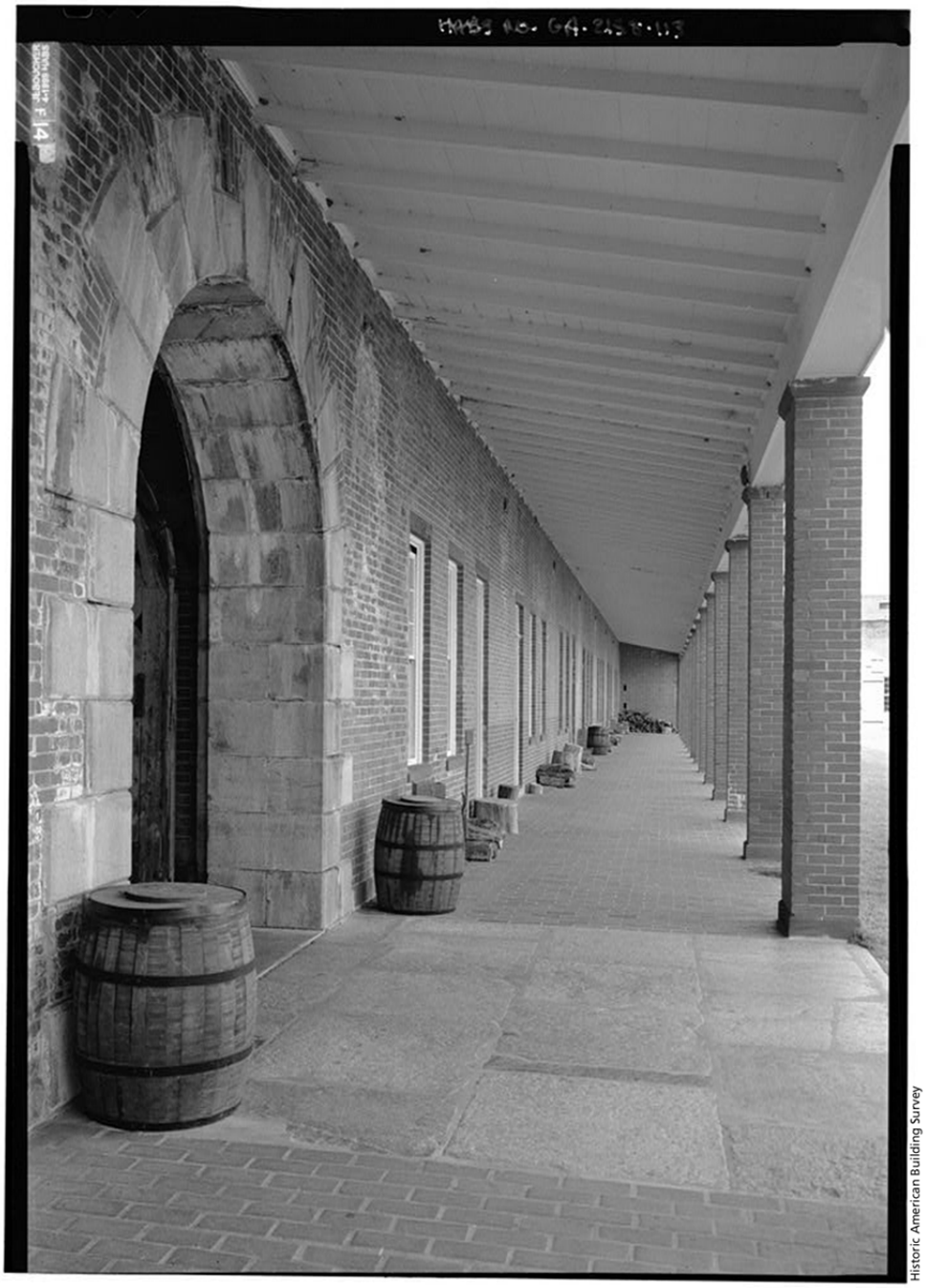
- Confirm the purpose, significance, and special mandates of Fort Pulaski National Monument.
- Clearly define resource conditions and visitor uses and experiences to be achieved in the national monument.
- Provide a framework for Fort Pulaski's managers to use when making decisions about how to best protect monument resources, how to provide high-quality visitor uses and experiences, how to manage visitor use, and what kinds of facilities, if any, to develop in/near the national monument.
- Ensure that this foundation for decision making has been developed in consultation with interested stakeholders and adopted by the NPS leadership after an adequate analysis of the benefits, impacts, and economic costs of alternative courses of action.

Legislation establishing the National Park Service as an agency and governing its management provides the fundamental direction for the administration of Fort Pulaski National Monument (and other units and programs of the national park system). This general management plan will build on these laws and the presidential proclamation that established Fort Pulaski National Monument to provide a vision for the monument's future.

The "Servicewide Laws and Policies" section calls the reader's attention to topics that are

important to understanding the management direction at the national monument. The alternatives presented in this general management plan comprise a variety of strategies intended to attain and maintain a set of desired future conditions in the monument that have not previously been mandated by either law or policy.

The general management plan does not describe how particular programs or projects should be prioritized or implemented. Those decisions will be addressed in future, more detailed planning efforts. All future plans will tier from the approved general management plan.



Interior Walkway with Arches

FORT PULASKI NATIONAL MONUMENT AREA MAP

VICINITY
Fort Pulaski National Monument
United States Department of the Interior • National Park Service
October 2010

FORT PULASKI NATIONAL MONUMENT VICINITY MAP

FORT PULASKI NATIONAL MONUMENT SITE MAP

NEED FOR THE PLAN

A general management plan is needed to meet the requirements of the National Parks and Recreation Act of 1978 (PL 95-625) and the 1978 Redwood Act, which specified that management of the national parks "shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established." NPS policy (NPS *Management Policies 2006*, section 2.3.1.1) also mandates development of a general management plan for each national park system unit. Fort Pulaski has never had a general management plan prepared in conformance with the requirements of PL 95-625 and current management policies and guidelines. The 1971 Fort Pulaski master plan does not address many of the issues facing the monument today. Therefore this *General Management Plan / Wilderness Study / Environmental Impact Statement* has been prepared to comply with those legal and policy requirements.

This general management plan provides broad direction for the monument's future. It is needed to assist monument managers in making purposeful decisions based on a deliberate vision of the park. Also, because the population of the Savannah area and Tybee Island has increased dramatically in recent decades and because the demand to broaden the infrastructure serving this population has risen, the integrity of monument resources may be compromised.

General management planning is needed to

- clarify the levels of resource protection and public use that must be achieved for the park, based on the park-specific purpose and significance, plus the body of laws and policies directing park management
- determine the best mix of resource protection and visitor experiences beyond what is prescribed by law and policy based on the
  - purposes of the park
  - range of public expectations and concerns
  - resources occurring within the park
  - effects of alternative management plans on existing natural, cultural, and social conditions
  - long-term economic costs
- establish the degree to which the park should be managed to
  - preserve and enhance its cultural and natural resources.
  - provide appropriate visitor experiences and recreation opportunities

Purpose and Need for the Wilderness Study

When Congress passed the Wilderness Act of 1964, it declared a policy of securing for present and future generations the benefits of an enduring resource of wilderness. The Wilderness Act (16 USC §§ 1131-1136) established the national wilderness preservation system, a collection of federally managed lands formally designated as "wilderness areas." The purpose of wilderness designation is to preserve and protect the wilderness character and wilderness values of wild lands in perpetuity, including opportunities for solitude or primitive and unconfined recreation. Only Congress can designate lands for inclusion in the national wilderness preservation system.

To fulfill its responsibilities under the Wilderness Act, the National Park Service evaluates all of its lands to determine whether they are eligible for inclusion in the national wilderness preservation system (see NPS *Management Policies 2006*, section 6.2.1). Individual parks with extensive roadless and undeveloped areas are responsible for preparing a wilderness eligibility assessment, which consists of a brief memorandum making a managerial determination as to the eligibility of park lands for wilderness designation. If any lands are found eligible, a

formal wilderness study is subsequently prepared. Wilderness studies assess the wilderness character of eligible lands in more detail and develop a recommendation to Congress for wilderness designation. Wilderness studies can propose that all, some, or no eligible lands be designated as wilderness.

McQueens Island at Lazaretto Creek

During formulation of the management alternatives that are described in chapter 2, the planning team evaluated the wilderness character of the 5,000-acre salt marsh that comprises the McQueens Island section of the national monument. This evaluation constituted the wilderness eligibility assessment required by policy. The importance of this marsh to the region's natural resources is high and will continue to grow as fisheries and bird habitat become more threatened. The aesthetic value is also high as it provides an unspoiled scenic vista that is nearly impossible to obtain in the city of Savannah or nearby.

The planning team found that most of the salt marsh area retains its primeval character and appears to have been affected primarily by the forces of nature, with the imprint of humans' work largely unnoticeable. It is only accessible by water and its marshy nature makes it nearly impossible for humans to walk on its surface. Accordingly, most of the salt marsh was found eligible for designation as wilderness (see wilderness eligibility assessment, appendix B).

After eligible lands were identified in the monument, the National Park Service initiated a formal wilderness study, as required by NPS *Management Policies 2006,* section 6.2.2. An official announcement of intent to prepare a wilderness study was published in the *Federal Register* on July 2, 2007. As part of this study, the National Park Service evaluated various options for designating wilderness at Fort Pulaski. Based on this evaluation, the National Park Service has developed a proposal that Congress designate all eligible lands at the monument as wilderness. Details of the wilderness proposal are included in the wilderness study section of chapter 2. The public was invited to comment on the draft wilderness proposal by providing written comments or by speaking at one of the public meetings at which court reporters were available to record comments.

FORT PULASKI MOAT

The Next Steps

The *General Management Plan / Wilderness Study / Environmental Impact Statement* included a 60-day public review and comment period after which the NPS planning team evaluated comments from other federal, state, and local governmental agencies, tribes, organizations, businesses, and individuals regarding the draft plan and incorporated appropriate changes into a final *General Management Plan / Wilderness Study / Environmental Impact Statement*. The final plan includes letters from governmental agencies, any substantive comments on the draft document, and NPS responses to those comments. Following distribution of the final *General Management Plan / Wilderness Study / Environmental Impact Statement* and a 30-day no-action period, a Record of Decision approving a final plan will be signed by the NPS regional director. The Record of Decision documents the National Park Service selection of an alternative for implementation. With the signing of the Record of Decision, the plan can then be implemented.

IMPLEMENTATION OF THE PLAN

The implementation of the approved plan will depend on future funding. The approval of a plan does not guarantee that the funding and staffing needed to implement the plan will be forthcoming. Full implementation of the approved plan could be many years in the future.

The implementation of the approved plan could also be affected by other factors. Once the general management plan has been approved, additional feasibility studies and more detailed planning and environmental documentation would be completed, as appropriate, before any proposed actions can be carried out. For example:

- Appropriate permits would be obtained before implementing actions that would impact wetlands.
- Appropriate federal and state agencies would be consulted concerning actions that could affect threatened and endangered species.
- The state historic preservation division would be consulted.
- The park will comply with sections 106 (requires federal agencies to consult with the Advisory Council on Historic Preservation) and 110 (requirements for the preservation and use of historic buildings by federal agencies) of the National Historic Preservation Act (NHPA).
- Appropriate documentation would be prepared under the National Environmental Policy Act of 1969 (NEPA).

The general management plan does not describe how particular programs or projects should be prioritized or implemented. Those decisions will be addressed during the more detailed planning associated with strategic plans, implementation plans, etc. All of those future, more detailed plans will tier from the approved general management plan and will be based on the goals, future conditions, and appropriate types of activities established in the approved general management plan. Actions directed by general management plans or in subsequent implementation plans are accomplished over time. Budget restrictions, requirements for additional data or regulatory compliance, and competing national park system priorities could prevent immediate implementation of many actions. Major or especially costly actions could be implemented 10 or more years into the future.

FOUNDATION STATEMENT

Every unit of the national park system is required to have a formal statement of its core mission that will provide basic guidance for planning and management decisions. This statement identifies the purpose, significance, interpretive themes, fundamental resources

and values, and special mandates and administrative commitments of a park unit, as well as the legal and policy requirements for administration and resource protection that factor into management decisions.

Legislative Foundation

Fort Pulaski National Monument was established by Presidential Proclamation No. 1713 (43 Stat. 1968) on October 15, 1924. The War Department administered the monument until it was transferred to the Department of the Interior, National Park Service, by Executive Order 6166 issued pursuant to the authority of section 16 of the act of March 4, 1933 (47 Stat. 1517).

An act of Congress (49 Stat. 1979), approved on June 26, 1936, expanded the boundaries of the national monument to include all of the lands on Cockspur Island, Georgia, that were then or formerly under the jurisdiction of the Secretary of War. Furthermore, the legislation authorized the Secretary of the Interior to accept donated lands on McQueens and Tybee islands, in Chatham County, Georgia, for addition to the boundary of Fort Pulaski National Monument.

A presidential proclamation (72 Stat.1) dated August 14, 1958, expanded Fort Pulaski National Monument to include the Cockspur Island Lighthouse and the small island (Daymark Island) containing the lighthouse near the southeasterly shore of Cockspur Island.

An amendment (110 Stat. 4188, Public Law 104-333) to 49 Stat. 1979 cancelled the reservation of the U.S. Army Corps of Engineers (the Corps) on the north shore of Cockspur Island that allowed for the deposition of dredge spoil.

Purpose

Purpose statements are based on the monument's legislation and legislative history and NPS policies. The statements reaffirm the reasons for which the national monument was set aside as a unit of the national park system and provide the foundation for monument management and use.

The purposes of Fort Pulaski National Monument are to preserve and protect

- the 19th century masonry fort and its associated structures, and interpret its roles in coastal fortifications, military technology, and the Civil War
- other military structures, other government structures, and archeological resources associated with various military developments and fortifications on Cockspur Island
- approximately 5,000 acres of nearly pristine salt marsh on McQueens and Cockspur islands that constitute the largest portion of the national monument and interpret this important coastal ecology for the education, inspiration, and enjoyment of the visitor

Significance

Significance statements capture the essence of the park's importance to the nation's natural and cultural heritage. They are statements of why, within a national, regional, and systemwide context, the park's resources and values are important enough to warrant national park designation. Significance statements describe the park's distinctiveness and provide direction for park managers to make decisions that preserve resources and values consistent with the monument's purpose.

Fort Pulaski National Monument is nationally significant because

- it is the site of Robert E. Lee's first assignment as assistant project engineer after receiving his commission at West Point
- Fort Pulaski National Monument is the site where an innovative use of

rifled cannons resulted in the first successful breach of masonry fortifications at long range, leading to the eventual abandonment of brick and stone coastal defenses

- Fort Pulaski illustrates a historical continuum of coastal defenses on Cockspur Island and reflects many of the architectural features of other Third System forts
- this battle led to the closure of the Port of Savannah, which lessened the ability of the Confederacy to wage war and contributed to the ultimate preservation of the United States
- Fort Pulaski is the site of a tragic example of inhuman treatment of Confederate prisoners of war (often referred to as the "Immortal Six Hundred") in retaliation for the mistreatment of Union prisoners at Andersonville
- Fort Pulaski is the site where, following its capture by the Union Army, General David Hunter issued General Orders # 7 freeing those enslaved on Cockspur Island; President Abraham Lincoln later rescinded these orders but ultimately issued his own emancipation proclamation on January 1, 1863
- the monument preserves nearly 5,000 acres of virtually undisturbed coastal salt marsh, a rich and diverse ecosystem that is critically important to the health of the coastal environment and the coastal economy

Special Mandates and Administrative Commitments

Special mandates are park specific legislative or judicial requirements that expand upon or modify the park's basic mission and purpose. They may be worthy of discussion and special consideration because (1) they are unusual (such as a special provision in a park's establishing legislation for grazing); (2) they add another dimension to an area's purpose and significance (such as the designation of an area in the park as part of the national wilderness preservation system, the inclusion of a river in the national wild and scenic rivers system, a national historic landmark designation for part of a park, or a park's designation as a world heritage site or biosphere reserve); or (3) they commit park managers to specific actions (such as an action required by a court order). Administrative commitments are generally defined as agreements that have been reached through formal, documented processes with other federal or state agencies that refer to the co-management of specific natural or cultural resources.

Fort Pulaski has two long-standing administrative commitments:

- The monument has issued a long-term special use permit to the U.S. Coast Guard for a life-saving station on Cockspur Island encompassing about 6 acres of land with buildings, a dock, and communications equipment.
- The monument has also issued to the Savannah Pilots Association a special use permit for a dock and dormitory facility on Cockspur Island a short distance east of the Coast Guard station. However, based on research and a recent Office of Inspector General report, the legality of continuing to authorize the use by the permit is now subject to question. On March 9, 2011, the two senators from the state of Georgia introduced S.535, a bill to authorize Fort Pulaski to issue a noncompetitive lease to the Savannah Pilots Association in order to continue the longstanding relationship. This proposed legislation became law on December 19, 2011, when President Barack Obama signed it. The act authorizes the Secretary of the Interior to lease no more than 30,000 square feet of land and improvements at the location on Cockspur Island that has been used continuously by

the Savannah Pilots Association since 1940.

Fundamental Resources and Values

Fundamental resources and values are systems, processes, features, visitor experiences, stories, and scenes that warrant primary consideration during planning and management because they are critical to achieving the monument's purpose and maintaining its significance. It is these resources and values that maintain the park's purpose and significance, and if these resources are allowed to deteriorate, the park purpose and/or significance could be jeopardized. The following list is presented in no particular order of importance.

The military significance of the battle

- The naval blockade and the series of fortifications and batteries, such as Battery Hamilton, led to the closure of the Port of Savannah and the cutoff of Fort Pulaski from resupply.
- The Union army's capture of the fort and its subsequent use of the fort kept the Port of Savannah closed.
- The geography and other land and water features of the area facilitated the Union strategy.

The history of the development and evolution of coastal defenses in the United States

- The fort structure is characterized by its well-preserved condition and unique construction (primarily its shape and placement on the site).
- The fort is in an excellent state of preservation, virtually unaltered from its original design.
- The national monument is the site of Fort George, a colonial defensive structure begun in late 1761.
- The national monument is the site of Fort Greene, a First System fort begun in 1794.
- The 1869–1872 modernizations to Fort Pulaski (remodeling of the demilune, installation of underground magazines and passageways, and constructing gun emplacements) demonstrate the evolution of military strategy and technology.
- The national monument is the site of Battery Horace Hambright, a Spanish-American War era structure.

Map obtained in digital format from New York Public Library

HISTORIC MAP (HENRY MEHLES) OF FEDERAL BATTERIES

The story of military weaponry and tactics

- The fort structure itself, particularly the southeast angle, shows the damage clearly.
- Original rifled cannons, believed to have been used by Union troops on Tybee Island during the siege and reduction of the fort, now silent, serve as potent interpretive tools for both historian and monument visitor alike.
- The story includes the hasty surrender (April 11, 1862) by Colonel Charles H. Olmstead within 30 hours of the commencement of hostilities, as well as the groundbreaking application of military technology, the use of rifled cannons against masonry fortifications.

- The geography, landscape, and landforms of the area favored the Union attack strategy and tactics. (Lack of trees on Cockspur provided a clear view for the Union side while trees on Tybee Island provided concealment for the Union batteries.)
- Robert E. Lee visited Fort Pulaski in 1861 and assessed the defensive position of the fort as adequate to withstand attack by cannon from Tybee Island.

National Park Service

FREED MEN AND WOMEN AT FORT PULASKI

African American connections to the site

- Fort Pulaski's history includes the story of one of the earliest efforts to free enslaved African Americans months before Lincoln's emancipation proclamation. General David Hunter's efforts influenced Lincoln and were designed to help former slaves achieve full citizenship through military service, education, and the practice of subsistence farming rather than cash crops such as cotton.

Stories about the mistreatment of prisoners of war

- The national monument is the burial location for the 13 people who died during winter 1864–1865.
- Records and accounts of the events help illuminate those events for modern visitors.
- Archeological evidence of the cemetery contributes to interpretive programming.
- The fort was used as a prison.

Robert E. Lee's connections and contributions to the site

- Lee designed the dike system and the associated drainage ditches and canals.
- The young lieutenant supervised construction of the village used by workers, the principal wharf, and cisterns, some of which survive today.
- Lee prepared surveys that determined the fort's location.
- Lee's connections include stories about his experience in surviving the intense physical environment.
- Lee endured emotional stress due to isolation from local communities.
- There are many stories of Lee's interactions with the community of Savannah.

The vast virtually undisturbed salt marsh that stands in stark contrast to the heavily modified environment of Cockspur Island

- The size of the marsh and the fact that it exists as a contiguous habitat (ecological value of the size and scope of the area).
- Water quality is high enough to support recreational oyster harvesting.
- It is a nursery for many juveniles of fish and shellfish species.
- It provides habitat for many threatened and endangered species and species of concern (e.g., diamondback terrapin, manatee, wood stork).
- The calming and rejuvenating experience provided by views of the vast expanse of uninterrupted marsh.

- The marsh offers superb opportunities for eco-tourism (e.g., canoeing, kayaking).
- There is an opportunity to compare an altered environment with one essentially unaltered (Cockspur vs. McQueens islands).

Other Important Resources and Values

Parks may also have other important resources and values that may not be fundamental to the park's purpose and significance, but are nevertheless determined to be particularly important considerations for general management planning. Identifying other important resources and values is primarily done to separate those resources or values that are covered by the servicewide mandates and policies from those that have important considerations to be addressed in the general management plan.

Cultural Resources

- Wesley Monument—John Wesley, founder of Methodism, landed on Cockspur Island in 1736. Wesley's journal records:

  "...about eight in the morning I first set foot on American ground. It was a small uninhabited island...over against Tybee, called by the English Peeper Island. Mr. Oglethorpe led us through the moorish land on the shore to a rising ground...we chose an open place surrounded with myrtles, bays, and cedars, which sheltered us from the sun and wind, and called our little flock together to prayers."

  The previous quotation is inscribed on the Wesley Monument within Fort Pulaski National Monument. The monument is a simple brick column set on a limestone base.

- Battery Horace Hambright—Between 1898 and 1899, to provide additional harbor protection during the Spanish-American War, the War Department built Battery Horace Hambright on Cockspur Island's north shore (Meader and Binkley 2003).

QUARANTINE STATION AND HOSPITAL

- Quarantine Station—On May 8, 1889, the War Department issued a revocable license to the city of Savannah to establish a quarantine station on the northwest portion of Cockspur Island. A Caribbean-style raised cottage, still extant and used as the monument administrative headquarters today, was completed in 1891 for a quarantine officer (Meader and Binkley 2003).
- Cockspur Island Lighthouse—Situated on an islet off the southeastern tip of Cockspur Island marking the South Channel Savannah River, the Cockspur Island Lighthouse stands 12 miles east of the Port of Savannah. The islet, often covered by high tide, is composed of oyster shells and marsh grass. Documented references suggest the first brick tower, used as a daymark, was built on Cockspur Island between March 1837 and November 1839. In 1854, the structure was destroyed by a hurricane. The tower was rebuilt and enlarged on the same foundation the next year.

COCKSPUR LIGHTHOUSE FROM GROUND LEVEL

- Cisterns, brick foundation ruins, North Channel Pier—These elements are the remains of the construction village used by workers who built Fort Pulaski. The village consisted of small frame buildings, many built on stilts. Some of the structures served as dormitories for workers, while others were reserved for managers. A hospital and storage areas were also constructed. The remains of a stone pier on the north shore of Cockspur Island can be seen at the end of a trail that begins just northwest of the fort's parking lot.

Recreation Opportunities

- wildlife viewing opportunities (deer, herons, eagles, alligators, etc.)
- outdoor recreation opportunities (walking, bicycling, etc.)
- fishing opportunities

Primary Interpretive Themes

Interpretive themes are ideas, concepts, or stories that are central to the monument's purpose, significance, identity, and visitor experience. The primary interpretive themes define concepts that every visitor should have the opportunity to learn. Primary themes also provide the framework for the park's interpretation and educational programs, influence the visitor experience, and provide direction for planners and designers of the park's exhibits, publications, and audiovisual programs. Subsequent interpretive planning may elaborate on these primary themes.

In 1999, Representative Jesse Jackson Jr. (D-IL) inserted language in the Fiscal Year 2000 National Park Service appropriations bill that included this statement: "The Secretary of the Interior is directed to *encourage* (emphasis added) the National Park Service managers of Civil War battle sites to recognize and include in all of their public displays and multimedia educational presentations, the unique role that the institution of slavery played in causing the Civil War and its role, if any, at the individual battle sites."

In general management planning, primary interpretive themes may form the basis for alternatives and management zones that prescribe resource conditions and visitor experiences. Identifying primary themes leads to recommendations for interpretive and educational facilities, media, and services that are core to park missions and facilitate emotional and intellectual connections with park resources and values. The development and interpretation of primary themes provide a framework for shared perspectives among visitors, stakeholders, and the public.
The more significant themes at Fort Pulaski National Monument, extracted from the monument's August 2006 long-range interpretive plan are as follows:

- Fort Pulaski was strategically significant during the Civil War to both Confederate and Union political and military interests. (Shaping the Political Landscape—Political Theories)
- The rifle artillery siege of Fort Pulaski was a landmark experiment in the history of military science and

invention. (Expanding Science and Technology—Experiment and Invention)

- For more than 250 years, Cockspur Island served the colonial, state, and national governments as a strategic site for protecting economic and political interests. (Developing the American Economy—Government Policies and Practices, Shaping the Political Landscape)
- In October 1864, Union troops stationed at Fort Pulaski accepted transfer of a group of imprisoned Confederate officers who later became known as the Immortal Six Hundred. The treatment of prisoners of war and political prisoners continues to be a relevant topic in the 21st century. (Shaping the Political Landscape—Military Institutions)
- A labor force of skilled workers, both free and slave, under the supervision of the U.S. Army Corps of Engineers, built the fort. (Developing the American Economy—Workers and Work Environments)

David Libman, National Park Service

NORTH TIDAL GATE

- The construction village that used the northern bank of the Savannah River provided living accommodations for the skilled workers. A large pier was constructed to handle the arrival of supplies from ports north and south. (Developing the American Economy—Workers and Work Environments)
- The design and construction of Fort Pulaski was a significant project for the U.S. Army Corps of Engineers. (Shaping the Political Landscape—Military Institutions)
- King Cotton brought wealth to the South and the port city of Savannah. (Developing the American Economy—Exchange and Trade)
- The artificial environments on Cockspur Island contrast significantly with the natural environments on adjacent McQueens Island. (Transforming the Environment—Adverse Consequences)
- The Savannah bar pilots and their forbears have served the Port of Savannah from Cockspur and McQueens islands almost continuously since 1762. (Developing the American Economy—Exchange and Trade)
- Fort Pulaski and its remnant structures on Cockspur Island and the vast salt marshes of McQueens Island are worthy of protection as a unit of the national park system. (Transforming the Environment—Protecting and Preserving)
- Much of Fort Pulaski National Monument's initial restoration and site operations were carried out by the Civilian Conservation Corps (CCC) as part of the federal government's effort to stimulate recovery from the Great Depression. (Developing the American Economy—Government Policies and Practices/Workers and Work Environments)
- Cockspur and McQueens islands were laboratories for technical and scientific developments in mosquito control, particularly during the period 1935–80. (Expanding Science and Technology—Effects on Lifestyle and Health/Transforming the Environment—Manipulating the Environment and Its Resources)

SERVICEWIDE LAWS AND POLICIES

This section (expanded in appendix A) identifies what must be done at Fort Pulaski National Monument to comply with federal laws and policies of the National Park Service. Many park management directives are specified in laws and policies guiding the National Park Service and are therefore not subject to alternative approaches. For example, there are laws and policies about managing environmental quality (such as the Clean Air Act, the Endangered Species Act, and Executive Order 11990, "Protection of Wetlands"); governing the preservation of cultural resources (such as the National Historic Preservation Act and the Native American Graves Protection and Repatriation Act); and providing public services (such as the Americans with Disabilities Act), to name only a few. In other words, a general management plan is not needed to decide, for instance, that it is appropriate to protect endangered species, control nonnative species, protect archeological sites, conserve artifacts, or provide for universal access. Laws and policies have already decided those. Although attaining some of the conditions set forth in these laws and policies may have been temporarily deferred in the park because of funding or staffing limitations, the National Park Service will continue to strive to implement these requirements with or without a new general management plan.

Some of these laws and executive orders are applicable solely or primarily to units of the national park system. These include the 1916 Organic Act that created the National Park Service, the General Authorities Act of 1970, the act of March 27, 1978, relating to the management of the national park system, and the National Parks Omnibus Management Act (1998). Other laws and executive orders have much broader application, such as the Endangered Species Act, the National Historic Preservation Act, and Executive Order 11990, that address the protection of wetlands (see appendix A).

The NPS Organic Act (16 USC § 1) provides the fundamental management direction for all units of the national park system:

- [P]romote and regulate the use of the Federal areas known as national parks, monuments, and reservations…by such means and measure as conform to the fundamental purpose of said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

The National Park System General Authorities Act (16 USC § 1a-1 et seq.) affirms that while all national park system units remain "distinct in character," they are "united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage." The act makes it clear that the NPS Organic Act and other protective mandates apply equally to all units of the system. Further, amendments state that NPS management of park units should not "derogat[e]…the purposes and values for which these various areas have been established."

The National Park Service also has established policies for all units under its stewardship. These are identified and explained in a guidance manual entitled NPS *Management Policies 2006*. The "action" alternatives (alternatives B and C) considered in this document incorporate and comply with the provisions of these mandates and policies.

Public Law 95-625, the National Parks and Recreation Act, requires the preparation and timely revision of general management plans for each unit of the national park system. Section 604 of that act outlines several requirements for general management plans,

including measures for the protection of the area's resources and "indications of potential modifications to the external boundaries of the unit and the reasons therefore." NPS *Management Policies 2006* reaffirms this legislative directive.

To truly understand the implications of an alternative, it is important to combine the servicewide mandates and policies with the management actions described in an alternative.

Table 1 shows some of the most pertinent servicewide mandates and policy topics related to planning and managing Fort Pulaski National Monument; each topic has desired conditions that NPS staff is striving to achieve. Appendix A expands on this information by citing the law or policy directing these actions and giving examples of the types of actions being pursued. The alternatives in this general management plan address the desired future conditions that are not mandated by law and policy and must be determined through a planning process.

The Georgia Department of Transportation's U.S. Highway 80 Bridges Replacement Study

This project is an initiative of the Coastal Region Metropolitan Planning Organization in coordination with the Chatham County-Savannah Metropolitan Planning Commission (MPC) to identify feasible solutions for safety and access issues on the Bull River and Lazaretto Creek bridges, as well as for flooding issues on U.S. Highway 80 between the bridges. In a previous project for the same stretch of road between Bull River and Lazaretto Creek, the Georgia Department of Transportation notified Fort Pulaski that some land within the monument boundary would be required for the expanded right-of-way as well as for temporary storage of materials and for staging purposes. If this requirement would still exist under any of the alternatives under consideration for the U.S. Highway 80 bridges replacement project, then the legal opinion described below would apply.

An opinion issued by the Department of the Interior's regional solicitor in Atlanta dated October 13, 2006, concluded that an act of Congress would be required to enable a land exchange between Fort Pulaski National Monument and the Georgia Department of Transportation unless the Secretary of the Department of the Interior, under section 4(f) of the Department of Transportation Act of 1966, determines that impacts from the project on the national monument will be *de minimis*.

The monument will negotiate with the Georgia Department of Transportation to provide for mitigation of lands that could be lost to the project and for other impacts. The highway bisects Fort Pulaski National Monument and therefore this project has the potential to adversely impact natural and cultural resources on the McQueens Island side of the park. The National Park Service has participated in the planning process and will continue to do so as this project moves forward.

TABLE 1. SERVICEWIDE MANDATES AND POLICIES PERTAINING TO FORT PULASKI NATIONAL MONUMENT

Topic	Current laws and policies require that the following conditions be achieved at Fort Pulaski National Monument
Relations with Private and Public Organizations, Owners of Adjacent Land, and Governmental Agencies	Fort Pulaski National Monument is managed as part of a greater ecological, social, economic, and cultural system. Good relations are maintained with adjacent landowners, surrounding communities, and private and public groups that affect, and are affected by the park. The monument is managed proactively to resolve external issues and concerns and ensure that monument values are not compromised. Because the national monument is an integral part of a larger regional environment, the National Park Service works cooperatively with others to anticipate, avoid, and resolve potential conflicts, protect national monument resources, and address mutual interests in the quality of life for community residents. Regional cooperation involves federal, state, and local agencies, neighboring landowners, and all other concerned parties.
Natural Resources	
Air Quality	Air quality in the monument meets national ambient air quality standards for specified pollutants. Monument air quality is maintained or enhanced with no significant deterioration.
Climate Change	Climate change is expected to affect the park's weather, resources (e.g., shorelines, vegetation, and wildlife), facilities (e.g., docks and roads), and visitors (e.g., seasonal use patterns, fishing, and other visitor opportunities such as typical beach activities). These changes will have direct implications on resource management and park operations and on the way visitors use and experience the park. Although climate change is expected to affect the park during the life of this plan, many of the specific effects, the rate of changes, and the severity of impacts are not known. Desired Condition: Fort Pulaski National Monument is a leader in its efforts to address climate change by reducing the contribution of NPS operations and visitor activities to climate change; preparing for and adapting to climate change impacts; and increasing its use of renewable energy and other sustainable practices. NPS staff proactively monitors and mitigates the climate change impacts on cultural and natural resources and visitor amenities. The park provides refugia for marine and terrestrial species to increase their resilience to climate change. Education and interpretive programs help visitors understand climate change impacts in the park and beyond, and how they can respond to climate change. Partnerships with various agencies and institutions allow NPS staff to participate in research on climate change impacts. *Sources:* NPS Organic Act; Executive Order 13423 (includes requirements for the reduction of greenhouse gases and other energy and water conservation measures); Department of the Interior Secretarial Order 3289, Amendment 1, February 10, 2010 (ensures that climate change impacts be taken into account in connection with departmental planning and decision making); NPS *Management Policies 2006* (including sections on environmental leadership [1.8], sustainable energy design [9.1.1.6], and energy management [9.1.7]); NPS Environmental Quality Division's "Draft Interim Guidance: Considering Climate Change in NEPA Analysis."
Ecosystem Management	The monument is managed holistically, as part of a greater ecological, social, economic, and cultural system.
Nonnative Species	The management of populations of nonnative plant and animal species, up to and including eradication, are undertaken wherever such species threaten monument resources or public health and when control is prudent and feasible.
Fire Management	Fort Pulaski National Monument fire management programs are designed to meet resource management objectives prescribed for the various areas of the monument and to ensure that the safety of firefighters and the public are not compromised. All wildland fires are effectively managed, considering resource values to be protected and firefighter and public safety, using the full range of strategic and tactical operations as described in an approved fire management plan.

TABLE 1. SERVICEWIDE MANDATES AND POLICIES PERTAINING TO FORT PULASKI NATIONAL MONUMENT

Topic	Current laws and policies require that the following conditions be achieved at Fort Pulaski National Monument
Floodplains	Natural floodplain values are preserved or restored. Long-term and short-term environmental effects associated with the occupancy and modification of floodplains are avoided. When it is not practicable to locate or relocate development or inappropriate human activities to a site outside the floodplain or where the floodplain will be affected, the National Park Service • prepares and approves a statement of findings in accordance with Director's Order 77-2 • uses nonstructural measures as much as practicable to reduce hazards to human life and property while minimizing impacts on the natural resources of floodplains • ensures that structures and facilities are designed to be consistent with the intent of the standards and criteria of the National Flood Insurance Program (44 *Code of Federal Regulations* [CFR] 60)
General Natural Resources / Restoration	Native species populations that have been severely reduced in or extirpated from Fort Pulaski National Monument are restored where feasible and sustainable. Populations of native plant and animal species function in as natural condition as possible except where special considerations are warranted.
Geologic Resources	The National Park Service will preserve and protect geologic resources as integral components of monument natural systems. As used here, the term "geologic resources" includes both geologic features and geologic processes.
Land Protection	Land protection plans are prepared to determine and publicly document what lands or interests in land need to be in public ownership, and what means of protection are available to achieve the purposes for which the national park system unit was created.
Native Vegetation and Animals	The National Park Service will maintain as parts of the natural ecosystem all native plants and animals in the park.
Soils	The National Park Service actively seeks to understand and preserve the soil resources of Fort Pulaski National Monument, and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources. Natural soil resources and processes function in as natural a condition as possible, except where special considerations are allowable under policy.
Threatened and Endangered Species and Species of Concern	Federal- and state-listed threatened and endangered species and their habitats are protected and sustained. Native threatened and endangered species populations that have been severely reduced in or extirpated from Fort Pulaski National Monument are restored where feasible and sustainable.
Water Resources	Surface water and groundwater are protected, and water quality meets or exceeds all applicable water quality standards. NPS and NPS-permitted programs and facilities are maintained and operated to avoid pollution of surface water and groundwater.
Wetlands	The natural and beneficial values of wetlands are preserved and enhanced. The National Park Service implements a "no net loss of wetlands" policy and strives to achieve a longer-term goal of net gain of wetlands across the national park system through the restoration of previously degraded wetlands. The National Park Service avoids to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and avoids direct or indirect support of new construction in wetlands wherever there is a practicable alternative. The National Park Service compensates for remaining unavoidable adverse impacts on wetlands by restoring wetlands that have been previously degraded.

TABLE 1. SERVICEWIDE MANDATES AND POLICIES PERTAINING TO FORT PULASKI NATIONAL MONUMENT

Topic	Current laws and policies require that the following conditions be achieved at Fort Pulaski National Monument
Cultural Resources	
Archeological Resources	Archeological sites are identified and inventoried and their National Register of Historic Places (national register) significance is determined and documented. Archeological sites are protected in an undisturbed condition unless it is determined through formal processes that disturbance or natural deterioration is unavoidable. When disturbance or deterioration is unavoidable, the site is professionally documented and excavated and the resulting artifacts, materials, and records are curated and conserved in consultation with the Historic Preservation Division of the Georgia Department of Natural Resources, Advisory Council on Historic Preservation, American Indian tribes, and others as appropriate. Mitigation may include a variety of measures ranging from avoidance to data recovery and is generally included in a memorandum of agreement. Artifacts, materials, and records resulting from data recovery are curated and conserved as provided for in 36 CFR 79. Some archeological sites that can be adequately protected may be interpreted to the visitor.
Historic Structures	Historic structures are inventoried and their significance and integrity are evaluated under National Register of Historic Places criteria. The qualities that contribute to the listing or eligibility for listing of historic structures on the national register are protected in accordance with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*. However, if it is determined through a formal process that disturbance or natural deterioration is unavoidable, mitigation measures and consultation are initiated as previously described for archeological resources.
Ethnographic Resources	Appropriate cultural anthropological research is conducted in cooperation with groups associated with Fort Pulaski National Monument. All ethnographic resources determined eligible for listing or listed on the national register are protected. If disturbance of such resources is unavoidable, formal consultation with the state historic preservation division, the Advisory Council on Historic Preservation, and with American Indian tribes as appropriate, is conducted.
Cultural Landscapes	Cultural landscape inventories are conducted to identify landscapes potentially eligible for listing in the national register and to assist in future management decisions for landscapes and associated resources, both cultural and natural. The management of cultural landscapes focuses on preserving the landscape's physical attributes, biotic systems, and uses when those uses contribute to its historical significance. Treatments are based on sound preservation practices for the preservation, rehabilitation, restoration, or reconstruction of cultural landscapes and is undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*. The National Park Service has prepared a cultural landscape report for Fort Pulaski National Monument, which was approved on August 1, 2011.
Museum Collections	All museum collections (prehistoric and historic objects, artifacts, works of art, archival documents, and natural history specimens) are identified and inventoried, catalogued, documented, preserved, and protected, and provision is made for access to and use of items in the collections for exhibits, research, and interpretation in consultation with traditionally associated groups. The qualities that contribute to the significance of collections are protected in accordance with established standards.

TABLE 1. SERVICEWIDE MANDATES AND POLICIES PERTAINING TO FORT PULASKI NATIONAL MONUMENT

Topic	Current laws and policies require that the following conditions be achieved at Fort Pulaski National Monument
Visitor Use and Experience	
Visitor Use and Experience and Park Use Requirements	Fort Pulaski National Monument resources are conserved "unimpaired" for the enjoyment of future generations. Visitors have opportunities for types of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the park. No activities occur that would cause derogation of the values and purposes for which the monument was established. For all zones, districts, or other logical management divisions within Fort Pulaski National Monument, the types and levels of visitor use are consistent with the desired resource and visitor experience conditions prescribed for those areas consistent with the unit's purpose. Park visitors will have opportunities to understand and appreciate the significance of the monument and its resources, and to develop a personal stewardship ethic by directly relating to the resources. To the extent feasible, programs, services, and facilities in the monument are accessible to and usable by all people, including those with disabilities within an inviting atmosphere accessible to every segment of American society.
Public Health and Safety	Although recognizing that there are limitations on its capability and constraints imposed by the Organic Act to not impair resources, the service and its concessioners, contractors, and co-operators will seek to provide a safe and healthful environment for visitors and employees. The monument staff will strive to identify recognizable threats to safety and health and protect property by applying nationally accepted standards. Consistent with mandates and nonimpairment, the monument staff will reduce or remove known hazards and/or apply appropriate mitigative measures, such as closures, guarding, gating, education, and other actions.
Other Topics	
Sustainable Design/ Development	NPS facilities are harmonious with monument resources, compatible with natural processes, aesthetically pleasing, functional, as accessible as possible to all segments of the population, energy efficient, and cost effective. All decisions regarding monument operations, facilities management, and development in the monument—from the initial concept through design and construction—reflect principles of resource conservation. Thus, all monument developments and monument operations are sustainable to the maximum degree possible and practical. New developments and existing facilities are located, built, and modified according to the *Guiding Principles of Sustainable Design* (NPS 1993) or other similar guidelines. Management decision making and activities throughout the national park system should use value analysis, which is mandatory for all Department of the Interior bureaus, to help achieve this goal. Value planning, which may be used interchangeably with value analysis / value engineering / value management, is most often used when value methods are applied on general management or similar planning activities.
Wilderness Values	The National Park Service preserves the wilderness character of those areas eligible for wilderness designation until such time as Congress makes the decision to include or exclude lands in the monument from the national wilderness preservation system.
Transportation To and Within the Park	Visitors have reasonable access to the park, and there are connections from the monument to regional transportation systems as appropriate. Transportation facilities in the monument provide access for the protection, use, and enjoyment of monument resources. They preserve the integrity of the surroundings, respect ecological processes, protect monument resources, and provide the highest visual quality and a rewarding visitor experience. The National Park Service participates in all transportation planning forums (U.S. Highway 80 and Savannah Harbor projects) that may result in links to parks or impact monument resources. Working with federal, tribal, state, and local agencies on transportation issues, the National Park Service seeks reasonable access to parks, and connections to external and alternative transportation systems.
Utilities and Communication Facilities	Neither Fort Pulaski National Monument resources nor public enjoyment of the monument are denigrated by nonconforming uses. Telecommunication structures are permitted in the monument to the extent that they do not jeopardize the monument's mission and resources. No new nonconforming use or rights-of-way are permitted through the monument without specific statutory authority and approval by the director of the National Park Service or his representative, and are permitted only if there is no practicable alternative to such use of NPS lands.

OTHER PLANNING EFFORTS RELATED TO THIS GENERAL MANAGEMENT PLAN

Fort Pulaski National Monument is located on Cockspur and McQueens islands, Georgia, between Savannah and Tybee Island on the Atlantic Ocean coast. The monument is surrounded mostly by waters including the North and South Channels Savannah River, the Bull River, the Atlantic Ocean, and Lazaretto Creek. The Georgia Department of Transportation owns Long Island and Bird Island, which lie immediately to the west of the Cockspur Island portion of the national monument and consist of land mostly created by dredge spoil from the Savannah River. There are no private landowners immediately adjoining the park; however there is a parcel on Tybee Island that is within the authorized boundary but is within private ownership. The owners of this parcel worked with Fort Pulaski to create a small park and exhibit to provide visitors with the only on-the-ground opportunity for visualizing the perspective and line of sight of the federal batteries on Tybee Island.

Several plans have influenced or would be influenced by the approved general management plan for Fort Pulaski National Monument. These include plans by the Coastal Region Metropolitan Planning Organization (CORE MPO) and the Georgia Department of Transportation to replace the U.S. Highway 80 bridges over Bull River and Lazaretto Creek, construct bicycle and pedestrian facilities that link to Tybee Island and the McQueens Island Trail, and improve conditions in flood-prone areas. A major planning effort by the Georgia Port Authority in conjunction with the U.S. Army Corps of Engineers aims to deepen the North Channel Savannah River to accommodate larger and faster container ships in order to maintain competiveness for the Port of Savannah. Both of these projects have potentially serious impacts on natural and cultural resources within the national monument.

The National Park Service has prepared a cultural landscape report for Fort Pulaski National Monument which was approved on August 1, 2011. The following sections highlight those plans most relevant to this general management plan.

The Georgia Ports Authority's Savannah Harbor Expansion Project

The U.S. Army Corps of Engineers is the lead federal agency for an evaluation of the deepening of the federal navigation project at Savannah Harbor, Georgia, in increments from the existing depth of 42 feet Mean Low Water to a potential depth of 48 feet, to ease current shipping constraints and to accommodate anticipated growth in commerce and vessel sizes. In the Water Resources Development Act of 1999, the U.S. Congress authorized deepening the navigation channel to a maximum depth of 48 feet Mean Low Water, subject to further studies and approval of those study results by four federal agencies. The other three federal agencies—the U.S. Environmental Protection Agency (USEPA) (Region IV), the Department of Commerce (acting through the National Marine Fisheries Service), and the Department of the Interior (acting through the U.S. Fish and Wildlife Service)—have agreed to participate as cooperating agencies in the preparation of the Tier II Environmental Impact Statement. The Georgia Ports Authority will also serve as a cooperator in the environmental impact statement development process.

Wave action from larger, faster container ships entering and leaving the Port of Savannah has the potential to cause serious erosion to the northern shoreline of Cockspur Island and the foundation of the Cockspur Island Lighthouse just off the eastern shore of Cockspur Island.

The National Park Service Cultural Landscape Report

The National Park Service has prepared a cultural landscape report for Fort Pulaski National Monument, which was approved on August 1, 2011. The plan sets broad goals for future resource conditions and visitor experiences. A cultural landscape report establishes more specific preservation goals for a cultural landscape. The goals must be grounded in research, inventory, documentation, and analysis and evaluation of a landscape's characteristics and associated features. The content of a cultural landscape report provides the basis for making sound decisions about management, treatment, and use. A report may include information spanning numerous disciplines in order to evaluate a landscape's historical, architectural, archeological, ethnographic, horticultural, landscape, architectural, and engineering features, along with ecological processes and natural systems. Based on this information and site management goals, such as access, contemporary use, and interpretation, a cultural landscape report outlines appropriate treatment for a landscape consistent with its significance, condition, and planned use.

The Georgia State Historic Preservation Plan 2007–2011 (Building a Preservation Ethic)

The preparation and implementation of a statewide comprehensive plan for historic preservation is required by the National Park Service for the participation of a state historic preservation office in the national historic preservation program. In Georgia, the Historic Preservation Division, a unit of the Department of Natural Resources, administers the program. This document is the guiding document for the state's historic preservation program. The primary goal in the Georgia historic preservation plan is naturally to "Preserve Georgia's Historic Resources." The National Park Service assists and partners with the Historic Preservation Division in many ways to achieve this goal. An important example is the Certified Local Governments Program. Seventy-five Georgia communities (including Savannah and Chatham County) participate in the program, choosing to enter into a preservation partnership with the Historic Preservation Division and the National Park Service. By passing a preservation ordinance and establishing a local commission that complies with the Georgia Historic Preservation Act, these communities commit to actively protect their historic resources. This partnership establishes a relationship among these local governments and the state and federal agencies carrying out historic preservation programs. Certified local government programs benefit from this status by receiving technical assistance and being eligible for grant funds passed through the Historic Preservation Division from the National Park Service.

The Regional Plan of Coastal Georgia 2010

"The *Regional Plan of Coastal Georgia* has been created to provide guidance to regional and business leaders, local government, state and federal agencies, and citizens as they help shape coastal Georgia's future. It is the result of a comprehensive review and analysis of coastal Georgia's 10 counties and 35 municipalities' land development trends and patterns that identified opportunities and challenges facing the region." Under the heading "Intrinsic Resources: Cultural and Historical" the Coastal Regional Commission expresses a vision of protecting, restoring, enhancing, and managing these resources for the benefit of its citizens, visitors, and future generations. This is a similar vision to that expressed in the language found in the National Park Service Organic Act of 1916: "…to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." More specifically, a

guiding principle in this section of the plan is to "Maintain viewsheds of significant cultural and historic assets." Performance standards for achieving this principle include adopting design guidelines that protect viewsheds of significant cultural and historic assets and restricting incompatible features from encroaching on important cultural, archeological, and historical viewsheds. These principles and performance standards are perfectly in tune with a major emphasis of the Fort Pulaski National Monument general management plan, which is to reestablish and preserve the views between the southeast angle of the fort and the positions of the Union batteries that reduced that face of the structure to rubble in April 1862.

Coastal Georgia Comprehensive Economic Development Strategy 2007

"The Coastal Georgia Comprehensive Economic Development Strategy is designed to bring together the public and private sectors in the creation of an economic roadmap to diversity and strengthen the regional economy. By completing this strategy, the region is eligible for economic development assistance investment from the U.S. Department of Commerce, Economic Development Administration. The region served by the Coastal Georgia Regional Development Center is also an Economic Development District designated by the Economic Development Administration. Economic development assistance investments from the Economic Development Administration can help fund local infrastructure projects, technology-led economic development projects, and strategies to respond to sudden and severe economic dislocations (e.g., major lay-offs, plant closures)."

Among the major strategies of this plan are the balancing of recreational uses of coastal resources with environmental protection, and the enhancement of natural, historic, and cultural core areas for recreation, public education, and tourist attractions to the extent such enhancements are appropriate within the protection mission. The mission and purpose of Fort Pulaski National Monument and the general management plan alternatives in this document are entirely consistent with these strategies.

Gullah/Geechee Cultural Heritage Corridor Management Plan

Designated by Congress in 2006, the Gullah/Geechee Cultural Heritage Corridor extends from Wilmington, North Carolina, in the north to Jacksonville, Florida, in the south. It is home to one of America's most unique cultures, a tradition first shaped by captive Africans brought to the southern United States from West Africa and continued in later generations by their descendants. The Gullah/Geechee Cultural Heritage Corridor Commission in early 2009 embarked on a series of 21 public meetings for the development of a management plan. In June 2009, at a public input meeting in Savannah, Georgia, Tammy Herrell, Administrative Officer of Fort Pulaski National Monument, addressed the meeting by noting Fort Pulaski's involvement with the Gullah/Geechee Corridor since the year 2000 and by expressing the determination of the monument superintendent and staff to continue educational and interpretive programs that blend the Gullah/Geechee history and culture with the other stories that are part of the Fort Pulaski program.

PLANNING ISSUES/CONCERNS

During scoping (early information gathering) for this general management plan, National Park Service staff, the general public, university scientists and historians, local, state, and county government representatives, and other federal agency staff identified various issues and concerns. An issue is defined as an opportunity, conflict, or problem regarding the use or management of public lands. Comments were solicited at public meetings, through

planning newsletters, and on the Fort Pulaski National Monument's website (see chapter 5, "Consultation and Coordination").

Comments received during scoping revealed concerns about access to the Cockspur Island Lighthouse, interpretation of African American history associated with the site, potential expansion of the monument boundary to include sites of federal batteries on Tybee Island, potential adverse impacts on the monument's natural and cultural resources from the proposed U.S. Highway 80 bridges replacement project and the deepening of the North Channel Savannah River, and extension of the McQueens Island hiker/biker path to Lazaretto Creek and ultimately across the creek to Tybee Island. The issues and concerns generally involve protecting monument resources from shoreline erosion, oil and other hazardous material spills in the Savannah River, and excessive use. The general management plan alternatives provide strategies for addressing the issues within the context of the Fort Pulaski's purpose, significance, and special mandates.

DECISION POINTS AND CONSIDERATIONS

Many aspects of the desired future conditions of Fort Pulaski National Monument are defined in the establishing presidential proclamation, the monument's purpose and significance statements, and established laws and policies. The resolution of questions or issues that have not already been addressed by legislation or laws and policies are the basis for developing different alternatives or approaches to managing the park into the future, because usually there is more than one way an issue could be resolved. As with any decision-making process, there are key decisions that, once made, will dictate the direction of subsequent management strategies. Based on public and partner comments and NPS concerns, the following major decision points were identified for Fort Pulaski National Monument:

- Should the cultural landscape of Cockspur Island be restored to look more like it did in 1862, which would involve removal of some trees and relocating the visitor parking lot to an area not visible from the terreplein (gun deck) of the fort?
- What provisions should be made for recreational opportunities outside the dike system (fishing, canoeing, or kayaking in the South Channel Savannah River, etc.)?
- Should the monument boundary be expanded to include sites of union batteries that are not currently protected?
- Should interpretive programs and displays emphasize primarily the strategies, people, and technology (rifled cannon) associated with the siege and capture of Fort Pulaski in April 1862 or should equal attention be paid to the causes of the Civil War, the use of the fort as a refuge for escaped or freed slaves, the pre-Civil War history of the construction of the fort, and other historical events?

CLIMATE CHANGE

Finally, the phenomenon of climate change has been included in the analysis and has resulted in the development of strategies common to all alternatives. All national park system areas are affected by climate change, but coastal units such as Fort Pulaski National Monument are perhaps more immediately vulnerable to the effects of global warming such as sea level rise and more violent and frequent storm events than parks more distant from the coasts and at higher elevations above sea level.

The National Park Service recognizes that the major drivers of climate change are outside the control of the agency. However,

climate change is a phenomenon whose impacts throughout the national park system cannot be discounted. Some of these impacts are already occurring or are expected in Fort Pulaski National Monument in the life span of this management plan. Therefore, climate change is included in this document to recognize its role in the changing environment of the national monument and to provide an understanding of its impact; other factors driving environmental change include population growth in the area (subsidence of water table, increased visitation, pollution), and major public projects around Fort Pulaski such as the proposed deepening of the north channel of the Savannah River and proposed bridge replacements on U.S. Highway 80 within the national monument boundary.

Although climate change is a global phenomenon, it manifests differently depending on regional and local factors. Climate change is expected to result in many changes to the Atlantic coast of the eastern United States, including warming ocean waters, hotter summer temperatures and fewer winter freezes, sea level rise, and higher storm surges. In addition to these likely widespread effects, specific impacts on Fort Pulaski National Monument could include shifting shorelines due to coastal erosion, erosion of archeological sites, saltwater intrusion into soils and vegetation, flooding of the critical salt marsh environment of McQueens Island, and threats to the integrity and foundation of the Cockspur Island Lighthouse. This dynamic environment is expected to affect the natural and cultural resources in the national monument, as well as visitor use patterns.

Questions to be addressed are as follows:

- What is the contribution of the proposed project to climate change, such as greenhouse gas emissions and the "carbon footprint"?
- What are the anticipated effects of climate change on the national monument resources and visitors that are affected by the management alternatives?

Because the contribution of the proposed project to climate change is negligible under any alternative, the former issue has been dismissed. The latter issue, a discussion of the anticipated effects of climate change on national monument resources, has been carried forward.

ISSUES

The NPS planning team completed the initial scoping phase of the planning process by meeting with other federal agencies, state and local agencies, and a variety of partners, stakeholders, and other interested parties. The result was a wide-ranging list of concerns and suggestions for the National Park Service to consider in developing the general management plan.

The team received approximately 70 comments and suggestions during scoping. Many of the comments and suggestions fell into the following four categories:

- **Interpretation**. The team received suggestions for including and expanding the interpretation of African American experiences at Fort Pulaski. Other contributors noted the growth in ecotourism and natural history interpretation and recommended increasing programs in these areas. The military history of the fort and its connection to the larger military history of Savannah was also a theme recommended for the monument's interpretive program.
- **Boundary expansion.** The protection and possible acquisition of federal batteries was a common element in this category.
- **U.S. Highway 80 widening.** Many respondents emphasized both the need for participation in project planning to protect the monument's resources and realization of

opportunities to benefit Fort Pulaski through improved access, safety, vehicle turnouts, and terrapin exclusion devices.

- **Wetlands/Marsh.** The vast salt marsh on the south side of U.S. Highway 80 evoked several comments from our partners and stakeholders. The identification and delineation of wetland boundaries was one focus. Another theme was the need to protect water quality and biodiversity in the salt marsh ecosystem.

IMPACT TOPICS—RESOURCES AND VALUES AT STAKE IN THE PLANNING PROCESS

An important part of planning is seeking to understand the consequences of making one decision over another. To this end, NPS general management plans are typically accompanied by full environmental impact statements. Environmental impact statements identify the anticipated impacts of possible actions on resources and on park visitors and neighbors.

Impact topics are specific natural, cultural, or socioeconomic resources or values (including visitor use and experience and park operations) that could be affected by implementation of any of the alternatives described in the general management plan, including the no-action alternative. Impacts to these resources or values must be identified, and the intensity or magnitude, duration, and timing of the effect to each resource must be disclosed in the environmental consequences section of the environmental impact statement.

The impact topics identified for this general management plan are outlined in this section; they were identified based on federal laws and other legal requirements, Council on Environmental Quality guidelines, NPS management policies, staff subject-matter expertise, and issues and concerns expressed by the public and other agencies early in the planning process. The planning team selected the impact topics for analysis based on the potential for each topic to be affected by the alternatives. Also included is a discussion of some impact topics that are commonly addressed in general management plans, but are dismissed from detailed analysis in this plan for the reasons given.

IMPACT TOPICS TO BE CONSIDERED

Cultural Resources

The National Historic Preservation Act and the National Environmental Policy Act require that the effects of any federal undertaking on cultural resources be taken into account. Also, NPS *Management Policies 2006* and *Cultural Resource Management Guidelines* (Director's Order 28) call for the consideration of cultural resources in planning proposals, and taking into account the concerns of traditionally associated peoples and stakeholders when making decisions about the monument's cultural resources. Actions proposed in this plan are focused in large part on the historic fort and surrounding environs, and thus could affect archeological resources, historic structures, cultural landscapes, ethnographic resources, and museum collections.

Archeological Resources. Regulations implementing the Archeological Resources Protection Act define archeological resources to be any material remains of human life or activities that are at least 100 years of age and that are of archeological interest. Of archeological interest means capable of providing scientific or humanistic understandings of past human behavior, cultural adaptation, and related topics through the application of scientific or scholarly techniques such as controlled observation, contextual measurement, controlled collection, analysis, interpretation, and explanation. Belowground resources associated with the

construction of Fort Pulaski include remains of the construction village, roadways, and mortar batteries. Dredge spoil deposited on the north shore of the island by the U.S. Army Corps of Engineers has covered the archeological remains associated with the northern portion of the construction village. Because these and other archeological resources could be affected by the proposed alternatives, this topic was retained for further analysis.

Historic Structures. 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. At Fort Pulaski there are 23 historic structures that include the fort, the fort moat, dikes, cisterns, various ruins, Battery Horace Hambright, and the Cockspur Island Lighthouse. These are among the most fundamentally important resources of Fort Pulaski National Monument and because one or more of the alternatives when implemented may affect them, this topic is retained for further analysis.

Fort Pulaski Arches

Cultural Landscapes. Cultural landscapes are complex resources that range from large rural tracts covering several thousand acres to formal gardens of less than an acre. Natural features such as landforms, soils, and vegetation are not only part of the cultural landscape, they provide the framework within which it evolves. In the broadest sense, a cultural landscape is a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions. Because some of these landscapes will be affected in different ways by alternatives in this plan, this topic is retained for further analysis.

Museum Collections. Museum objects are material things possessing functional, aesthetic, cultural, symbolic, and/or scientific value, usually movable by nature or design. Museum objects include prehistoric and historic objects, artifacts, works of art, archival material, and natural history specimens that are part of a museum collection. Large or immovable properties, such as monumental statuary, trains, nautical vessels, cairns, and rock paintings, are defined as structures or features of sites. Fort Pulaski National Monument has an extensive museum collection with the majority of the collection housed on-site. None of the alternatives in this general management plan are expected to have greater than negligible effects on museum collections. However, for purposes of consultation pursuant to section 106 of the National Historic Preservation Act, this topic is retained for further analysis.

Escaping to Fort Pulaski – Former and Escaped Slave March Haynes Standing in Boat

Ethnographic Resources. Ethnographic resources are landscapes, objects, plants and animals, or sites and structures that are

important to a people's sense of purpose or way of life. In other words, ethnographic resources are the kinds of resources managed by many other branches of the National Park Service, but understood from the viewpoint of peoples or groups for which they have a special importance different from that enjoyed by the public. There are several types of studies and research that the National Park Service uses to determine the extent of ethnographic resources in a particular park. The most comprehensive background study, the ethnographic overview and assessment, reviews existing information on park resources traditionally valued by stakeholders. The information comes mostly from archives and publications; interviews with community members and other constituents—often on trips to specific sites—supply missing data. This study also identifies the need for further research. Fort Pulaski National Monument has not yet been the subject of such an assessment and therefore the existence (or nonexistence) of ethnographic resources is undocumented.

However, research by Dr. Charles J. Elmore (Elmore 2002) and other records demonstrate that there are traditional attachments and connections between the African American community in the Savannah, Georgia, area and Fort Pulaski National Monument. However, none of the alternatives in the draft general management plan were expected to have greater than negligible impacts on these traditional attachments. Nevertheless, for purposes of consultation pursuant to section 106 of the National Historic Preservation Act, the topic of ethnographic resources was retained for further analysis. Chapter 2 of this *General Management Plan / Wilderness Study / Environmental Impact Statement* recommends the initiation and completion of an ethnographic overview and assessment.

Natural Resources

Geology and Soils. The geology and soils of Cockspur and McQueens islands reflect a somewhat varied environment and a complex history. The soils can be affected by construction, restoration, and visitor use. Geologic processes and formations can likewise be affected by these factors, as well as by off-site activities. Alternatives in this plan could have an adverse or beneficial impact on geology and soils; thus, this topic has been retained for analysis.

Plant Communities and Vegetation. Fort Pulaski National Monument has a variety of vegetation typical of the maritime and estuarine environment. It also has a significant amount of nonnative invasive vegetation. Alternatives presented in this plan could affect native and invasive nonnative vegetation; thus, this topic has been retained for analysis.

Fish and Wildlife. Fort Pulaski National Monument is home to a variety of fish, birds, and other wildlife. Alternatives presented in this plan could affect wildlife and fish species or important habitat; thus, this topic has been retained for analysis.

Water Quality. Effects on water quality are regulated by NPS policies and the Clean Water Act (33 USC 1344). NPS *Management Policies 2006*, section 4.6.3, states that the National Park Service will "take all necessary actions to maintain or restore the quality of surface waters and groundwaters within the parks consistent with the Clean Water Act and all other applicable federal, state, and local laws and regulations."

Surface water resources in the Fort Pulaski National Monument area of interest include the Atlantic Ocean, the Savannah River, miscellaneous tidal creeks, and the salt marshes of McQueens Island. Implementation of any of the action alternatives could result in increased sedimentation of surface water resources in the park. Therefore, this topic has been retained for analysis.

Wetlands and Floodplains. Executive Order 11990, "Protection of Wetlands," requires federal agencies conducting certain activities to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and to avoid new construction in wetlands if a practicable alternative exists. The National Park Service must determine if proposed actions will be in or will affect wetlands. If so, the responsible official shall prepare a wetlands assessment (statement of findings), which will be part of this environmental impact statement. There are two types of wetlands in the monument that could be affected by implementation of any of the action alternatives—palustrine and estuarine—so this topic is retained for analysis.

Executive Order 11988, "Floodplain Management," requires federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid, to the extent possible, adverse effects associated with direct and indirect development of a floodplain. If so, staff will prepare a floodplain assessment (statement of findings). The assessment will become part of the environmental assessment or environmental impact statement. The alternatives in this plan propose leaving facilities in floodplains or removing them; thus this topic has been retained for analysis.

Wilderness Resources and Values

The Wilderness Act of 1964 (16 USC §§ 1131–1136) established the national wilderness preservation system, a network of federal lands set aside for the permanent preservation of their wilderness character. Only Congress has the authority to designate new wilderness areas.

As required by NPS *Management Policies 2006*, section 6.2.1, and Director's Order 41: *Wilderness Preservation and Management*, the National Park Service has prepared a wilderness eligibility assessment that identifies those areas at Fort Pulaski National Monument meeting the criteria for future designation as wilderness (please see appendix B). This assessment, in turn, has served as the basis for a formal wilderness study, as required by NPS *Management Policies 2006*, section 6.2.2. The purpose of a wilderness study is to develop a proposal to Congress regarding the designation of wilderness at a particular park unit.

The wilderness study included in this document proposes that Congress designate most of the salt marsh of McQueens Island as wilderness. The designation of wilderness, should it occur, could have impacts on monument resources, monument operations, and visitor experience. At the same time, the draft general management plan prescribed management goals and activities that have the potential to affect the wilderness character of the areas proposed for designation. Therefore, this topic was retained for analysis.

Visitor Use and Experience

The Organic Act and NPS *Management Policies 2006* direct the National Park Service to provide visitors with enjoyment opportunities appropriate to the superlative resources found in the park. Actions in the alternatives could affect the types of facilities available to monument visitors, as well as the ability of visitors to engage in recreational activities. Actions in the plan could also affect the degree of visitor understanding and appreciation of monument resources. Therefore, this topic has been retained for analysis.

Socioeconomic Environment

The National Environmental Policy Act requires an examination of social and economic impacts caused by federal actions as part of a complete analysis of the potential impacts of these actions on the "human environment." Chatham County and the cities of Savannah and Tybee Island make up the affected area for the socioeconomic analysis. Private sector businesses, including

visitor service facilities and operators (e.g., restaurants and motels) could be affected by the actions proposed in this management plan. Therefore, this topic has been retained for analysis.

Climate Change

All national park system units are affected by climate change, but coastal units such as Fort Pulaski National Monument are perhaps more immediately vulnerable to the effects of global warming such as sea level rise and more violent and frequent storm events than more terrestrial parks. Therefore, this topic has been retained for analysis.

This impact topic looks at both the impacts of climate change on the monument and how the monument might have to adapt to such change as well as the monument's carbon footprint and how the monument can become more carbon neutral. Coastal national park system units must consider long-term management plans to counteract the negative impacts of sea-level rise on vulnerable coastal areas. The National Park Service and the U.S. Geological Survey have developed Coastal Vulnerability Index maps for a number of coastal parks. These maps identify coastal areas sensitive to sea-level rise, and will allow managers to take precautions necessary for their protection.

Transportation

Providing access to Fort Pulaski National Monument is a public and monument concern. Alternatives proposed in this plan could affect visitor access. In addition, the proposed bridges replacement project on U.S. Highway 80 could affect both access and monument resources. Therefore, this topic has been retained for analysis.

Park Operations

Staffing, funding needs, and monument priorities may change under some of the alternatives. Therefore, this topic has been retained for analysis.

Energy Requirements, Depletable Resources, and Conservation Potential

The National Park Service strives to use sustainable practices and technology and reduce its impact on natural or depletable resources. Under all of the alternatives, ecological principles would be applied to ensure that the monument's natural resources were maintained and conserved. However, the use and consumption of fuel and other nonrenewable resources for NPS operations, activities, and development would continue and vary among the alternatives. Therefore, this topic has been retained for analysis.

IMPACT TOPICS CONSIDERED BUT NOT ANALYZED IN DETAIL

The following topics were considered for detailed analysis, but dismissed for the reasons indicated.

Air Quality

The monument is in an area that has been designated class II under the Clean Air Act. By policy, the National Park Service seeks to perpetuate the best possible air quality in parks in order to preserve natural and cultural resources, and to sustain visitor enjoyment, human health, and scenic vistas (see NPS *Management Policies 2006*, section 4.7.1). The contribution of pollutants resulting from implementing any of the alternatives would be negligible compared to current levels. Therefore, air quality has been dismissed from further consideration.

Special Status Species

Analysis of the potential impacts on special status species (federal or state endangered,

threatened, candidate, or species of concern) is required by the federal Endangered Species Act, NPS management policies, the National Environmental Policy Act, and other laws and regulations. Thirteen special status species have been observed at Fort Pulaski National Monument (see table 2). None of the alternatives presented in this document have the potential to substantially affect any special status species or habitat. Land disturbance under all of the action alternatives will be relatively minor, and will mostly involve removal of nonnative, and some native, vegetation to restore selected historic sight lines. One alternative would involve moving the asphalt parking area to a new location, but this new location does not provide habitat to special status species.

In accordance with the Endangered Species Act and relevant regulations at 50 CFR 402, the National Park Service determined that the management plan is not likely to adversely affect any federally threatened or endangered species and sent a copy of the draft general management plan to the U.S. Fish and Wildlife Service office with a request for written concurrence with that determination. The National Park Service received that concurrence in a letter dated October 12, 2012, from the U.S. Fish and Wildlife Service field office in Athens, Georgia. In addition, the National Park Service has committed to consult on future actions conducted under the framework described in this management plan to ensure that such actions are not likely to adversely affect threatened or endangered species.

Coastal Zone Management

The Coastal Zone Management Act, 16 USC § 1451 et seq., requires that all federal activities in coastal areas be consistent with approved state coastal zone management programs to the maximum extent possible. Georgia's coastal zone management program requires a consistency determination for any general management plan generated by the National Park Service for a monument in the Georgia coastal zone.

TABLE 2. SPECIAL STATUS SPECIES—CHATHAM, EFFINGHAM, AND JASPER COUNTIES

Common Name	Scientific Name
Birds	
American oystercatcher*	*Haematopus palliates*
Bachman's warbler	*Vermivora bachmanii*
Bald eagle*	*Haliaeetus leucocephalus*
Gull-billed tern*	*Sterna nilotica*
Least tern*	*Sterna antillarum*
Peregrine falcon*	*Falco peregrinus*
Piping plover*	*Charadrius melodus*
Red-cockaded woodpecker	*Picoides borealis*
Swallow-tailed kite*	*Elanoide s forficatus*
Wilson's plover *	*Charadrius wilsonia*
Wood stork*	*Mycteria Americana*
Reptiles	
Eastern indigo snake	*Drymarchon couperi*
Gopher tortoise	*Gopherus polyphemus*
Spotted turtle	*Clemmys guttata*
Green sea turtle	*Chelonia mydas*
Hawksbill sea turtle	*Eretmochelys imbricate*
Kemp's ridley sea turtle	*Lepidochelys kempi*
Leatherback sea turtle	*Dermochelys coriacea*
Loggerhead sea turtle*	*Caretta caretta*
Amphibians	
Flatwoods salamander	*Ambystoma cingulatum*
Dwarf siren	*Pseudobranchus striatus*
Mammals	
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*
Humpback whale	*Megaptera novaeangliae*
Right (northern) whale	*Eubalaena glacialis*
West Indian manatee*	*Trichechus manatus*
Plants	
Chaffseed	*Schwalbea Americana*
Dwarf witch-alder	*Fothergilla gardenia*
Narrowleaf obedient plant	*Physostegia leptophylla*
Pondberry	*Lindera melissifolia*
Pondspice	*Litsea aestivalis*
Tidal marsh obedient plant	*Physostegia leptophylla*
Florida privet*	*Forestiera segrata*
Swamp dock*	*Rumex verticillatus*
Fish	
Shortnose sturgeon	*Acipenser brevirostrum*

Source: Rabolli and Ellington (1999); Govus (1998).
*Indicates species that have been observed in the park.

The National Park Service does not propose any development in any area of Fort Pulaski National Monument that would conflict

with the state coastal zone management program. A copy of the draft general management plan / wilderness study / environmental impact statement was submitted to the Georgia Department of Natural Resources, Coastal Resources Division, for a consistency review. The National Park Service received a positive consistency determination from the Coastal Resources Division in a letter dated July 19, 2012.

Soundscape

NPS *Management Policies 2006* (section 4.9) requires national park system unit managers to preserve the natural quiet and sounds associated with physical and biological resources (for example, the sounds of birds and flowing water). The natural soundscape (i.e., natural quiet) at Fort Pulaski is a special resource to park visitors. None of the action alternatives in this plan would result in long-term alteration of the soundscapes in the park. Efforts to preserve natural soundscapes in the monument would continue. Some short-term impacts from construction projects may occur for brief periods in the future, but impacts would be negligible. Degradation of the natural soundscape could occur as a result of activities outside the monument boundary (e.g., possible replacement of U.S. Highway 80 bridges at Bull River and Lazaretto Creek), but the impacts at this point are largely speculative. Therefore, this topic was dismissed from further analysis.

Lightscape Management (Dark Night Sky Preservation)

Light pollution is pervasive in the park, originating primarily from Tybee Island and the city of Savannah. The National Park Service strives to minimize the intrusion of artificial light into the night scene by limiting the use of artificial outdoor lighting to basic safety requirements, shielding the lights when possible, and using minimal impact lighting techniques. The level and type of new development and lighting proposed in this plan is minimal. The effects of the actions in this plan on natural lightscapes would be negligible. Therefore, lightscapes were dismissed from further analysis.

Urban Quality and Design of the Built Environment

The quality of urban areas is not a concern in this planning project. Vernacular architecture and park-compatible design would be considered for any new structures built under the alternatives. Emphasis would be placed on designs, materials, and colors that blend in and do not detract from the natural and built environment. Therefore, adverse impacts are anticipated to be negligible. No further consideration of this topic is necessary.

Socially or Economically Disadvantaged Populations

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. None of the alternatives considered in this document would result in any identifiable adverse health effects, and none of the impacts on the natural and physical environment would significantly and adversely affect any minority or low-income population or community. Therefore, environmental justice was dismissed as an impact topic.

Prime and Unique Agricultural Lands

Council on Environmental Quality regulations require that federal agencies assess the effects of their actions on

farmland soils classified by the Natural Resource Conservation Service as prime or unique. According to the Natural Resource Conservation Service, none of the soils in the project area are classified as prime or unique. Therefore, this topic was dismissed from further consideration.

Indian Sacred Sites and Indian Trust Resources

Executive Order 13007, "Indian Sacred Sites," requires all federal agencies to determine whether their proposed actions would restrict access to or ceremonial use of Indian sacred sites by Indian religious practitioners or adversely affect the integrity of such sacred sites. Secretarial Order 3175, "Departmental Responsibilities for Indian Trust Resources," requires that any anticipated impacts on Indian trust resources from a proposed action or project by a Department of the Interior bureau be explicitly addressed in environmental compliance documents.

None of the alternatives considered in this document would restrict access to any sites sacred to American Indians or limit ceremonial use of any such sites. None of the alternatives would affect Indian trust resources. Components of the plan designed to achieve enhanced management of cultural resources and a reduction in illegal relic hunting would have an overall beneficial effect on any Indian sacred sites. Therefore, this topic was dismissed from further consideration.

Public Health and Safety

The proposed developments and actions in the alternatives would not result in any identifiable impacts on human health or safety. Therefore, this topic was dismissed from further consideration.

Conformity with Local Land Use Plans

Land use at Fort Pulaski National Monument is consistent with local land use plans and regulations. The creation of additional visitor use opportunities in the monument as proposed in the alternatives would be consistent with existing land uses or local (non-National Park Service) land use plans, policies, or controls for the area. Designation of wilderness would not conflict with local land use nor would it prevent traditional motorboat use of creeks in the salt marsh, because NPS management policies allow motorboat use to continue when (a) this use has already become established in an area before its designation as wilderness, and (b) the legislation creating the wilderness area specifically states that motorboat use may continue. Therefore, this topic was dismissed from further consideration.

David Libman, National Park Service

ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE

CHAPTER 2: ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE

Many aspects of the desired future condition of Fort Pulaski National Monument are defined in the establishing legislation, the monument's purpose and significance statements, and the servicewide mandates and policies that were described earlier. Within these parameters, the National Park Service solicited input from the public, NPS staff, government agencies, and other organizations regarding issues and desired conditions for the national monument. Planning team members gathered information about existing visitor use and the condition of monument facilities and resources. They considered which areas of the national monument attract visitors, and which areas have sensitive resources.

Using the previously described information the planning team developed a set of management prescriptions and two action alternatives to reflect the range of ideas proposed by NPS staff and the public.

This chapter describes the management zones and the alternatives for managing the national monument for the next 20 years. The National Park Service planning process requires development of action alternatives (alternatives B and C) for comparison with no change in current monument management and trends (no-action, alternative A). The chapter includes tables that summarize the key differences between the alternatives and the key differences in the impacts that are expected from implementing each alternative. (The summary of impacts table is based on the analysis in chapter 4, "Environmental Consequences.") This chapter also describes mitigative measures that would be used to lessen or avoid impacts, future studies that would be needed, and the environmentally preferred alternative.

MANAGEMENT ZONES AND ALTERNATIVES

The building blocks for reaching an approved plan for managing a national park system unit are the management zones and the alternatives. All are developed within the scope of the park's purpose, significance, mandates, and legislation. Management zones are descriptions of desired conditions for monument resources and visitor experience in different areas of the park. Management zones are determined for each national park system unit; however, the management zones for one unit will probably not be the same for any other national park system unit (although some might be similar). The management zones identify the widest range of potential appropriate resource conditions, visitor experiences, and facilities for the monument that fall within the scope of the park's purpose, significance, and special mandates. Five management zones have been identified for Fort Pulaski National Monument (see table 4 later in this chapter).

The alternatives in this general management plan would create different future directions for the monument using management zones. Each of the action alternatives has an overall management concept and a description of how different areas of the monument would be managed. The concept for each alternative presents the overall picture for the monument in the future. For example, perhaps one management zone is called "natural resource" and another zone is called "recreation." An alternative whose concept is to keep most of the monument in an undeveloped and natural condition would have more of the natural resource zone than the recreation zone. Both zones might also be larger or smaller and in different locations in different alternatives, depending on the overall concept for each alternative.

This *General Management Plan / Wilderness Study / Environmental Impact Statement* presents three alternatives, including the NPS preferred alternative, for future management of Fort Pulaski National Monument. Alternative A, the "no-action" or "no-change" alternative, is a continuation of existing management direction, and is included as a baseline for comparing the consequences of implementing each alternative. The other "action" alternatives are designated B (the NPS preferred alternative) and C. The action alternatives are different ways of managing resources and visitor uses. The two action alternatives embody the range of what the public and the National Park Service want to see accomplished with regard to natural resource conditions, cultural resource conditions, visitor use and experience, the socioeconomic environment, transportation, and monument operations at the national monument. The National Park Service would continue to follow existing agreements and servicewide mandates, laws, and policies regardless of the alternatives considered in this plan. However, actions or desired conditions not mandated by policy, law, or agreements can differ among the alternatives.

The National Park Service would continue to follow existing agreements and servicewide mandates, laws, and policies regardless of the alternatives considered in this plan. These mandates and policies are not repeated in this chapter (see appendix A). However, other general management plan proposed actions do differ among the alternatives. These alternative actions are discussed in this chapter.

FORMULATION OF THE ALTERNATIVES

The alternatives focus on what resource conditions and visitor uses and experiences/opportunities should be at the monument rather than on details of how these conditions and uses/experiences should be achieved. Thus, the alternatives do not include many details on resource or visitor use management.

More detailed plans or studies will be required before most conditions proposed in the alternatives are achieved. The implementation of any alternative also depends on future funding and staffing and environmental compliance. This plan does not guarantee that that funding will be forthcoming. The plan establishes a vision of the future that will guide day-to-day and year-to-year management of the monument, but full implementation could take many years.

IDENTIFICATION OF THE PREFERRED ALTERNATIVE

The National Park Service uses a decision-making system called Choosing by Advantages to select a preferred alternative in the general management planning process. This decision-making system is based on determining the advantages of different alternatives for a variety of factors. The fundamental rule in this system is that sound decisions must be based on the importance of advantages.

One of the greatest strengths of this system is its fundamental philosophy: decisions must be anchored in relevant facts. This minimizes the subjectivity in the decision-making process and makes the decision as objective as possible. For example, the question "Is it more important to protect natural resources or cultural resources?" is unanchored; it has no relevant facts on which to make a decision. Without such facts, it is impossible to make a defensible decision. The Choosing by Advantages system instead asks us to decide which alternative gives the greatest advantage in protecting natural resources and cultural resources. To answer this question, relevant facts would be used to determine the advantages that the alternatives provide for both kinds of resources. For example, we may have facts that show that two alternatives disturb or restore equal amounts of vegetation, so neither alternative would be

more advantageous than the other in protecting natural resources. On the other hand, we may have relevant facts that show that one alternative would disturb five known archeological sites, while the other alternative would disturb only one. This alternative, then, would be more advantageous because it provides natural resource protection (equal to the other alternative) and also provides the greatest advantage for cultural resources.

The planning team used the Choosing by Advantages system to select alternative B as the preferred alternative and it is the NPS proposed action.

First, the planning team determined the factors that would be used in the decision. Those factors were based on the mission of the National Park Service and the purpose and significance of Fort Pulaski National Monument. Within the broader categories of factors, protection of cultural resources, protection of natural resources, and provision of visitor services and recreational opportunities, the team evaluated more specific resources and opportunities such as the extent to which each alternative would

- retain the integrity of the CCC era parking lot
- protect cultural resources by relocating the parking lot
- restore the 1862 viewshed
- restore the salt marsh
- remove nonnative and invasive species
- interpret the construction village and the CCC era
- provide interpretation opportunities through viewshed restoration

The planning team discussed each alternative for each factor and reached a consensus regarding how each factor should be characterized for each of the three alternatives under consideration, including the no-action (continue current management policies and strategies) alternative. The next step was to decide which alternative had the greatest advantage over the others for each factor and which had no advantage. Finally, through discussion and consensus the team decided a score for each advantage of between 0 and 100. The score of 100 was assigned to the advantage judged to be the greatest of all the advantages.

This process resulted in alternative B being substantially more advantageous in restoring the 1862 viewshed, protecting cultural resources such as the cemetery of veterans, removing nonnative and invasive species, and in providing interpretation opportunities due to viewshed restoration than the other alternatives. Alternative A, because it continues current management practices, does not adequately address many of the issues that emerged during the early scoping process and therefore scored lowest in terms of total advantage.

Finally the scores were totaled for each alternative and compared with the estimated cost of each alternative. Because alternative B was only slightly higher in cost than alternative C while providing significantly more advantages, alternative B was selected as the NPS preferred alternative for this *General Management Plan / Wilderness Study / Environmental Impact Statement*.

WILDERNESS STUDY

Congress established the national wilderness preservation system to ensure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States. Wilderness designation is intended to preserve and protect certain federally managed lands in their natural state and provide for compatible recreational opportunities, education, and scientific study. Wilderness areas are intended to contrast with lands where human activities dominate the landscape. Only Congress may designate lands for inclusion in the national wilderness preservation system.

Section 6.2.2 of NPS *Management Policies 2006* requires the National Park Service to

conduct a formal wilderness study of any lands previously found eligible for wilderness designation. As noted in chapter 1, approximately 4,500 acres of salt marsh at Fort Pulaski have been found eligible for designation as wilderness (see "Appendix B: Wilderness Eligibility Assessment"). The purpose of a wilderness study is to evaluate options for designating wilderness and to develop a formal wilderness proposal. Each wilderness study must consider a range of alternatives for wilderness designation, including a "no wilderness" alternative. The resulting proposal will serve as the basis for any wilderness recommendation that the president may submit to Congress, should he choose to do so.

This wilderness study has been guided by the Wilderness Act of 1964, where wilderness is defined and its values are articulated. An important consideration for this analysis has been the traditional use of motorboats in the tidal creeks of McQueens Island. Designation of wilderness, on the terms proposed herein, would not conflict with local land use nor would it prevent traditional motorboat use of creeks in the salt marsh, because NPS policies allow motorboat use to continue when (a) this use has already become established in an area before its designation as wilderness, and (b) the legislation creating the wilderness area specifically states that motorboat use may continue (16 USC § 1133 (d)(1)).

Definition of Wilderness

The Wilderness Act (16 USC § 1132) defines wilderness in the following manner:

"A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean . . . an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."

Uses and Management in Wilderness

Section 4 of the Wilderness Act (16 USC § 1134) provides that designated wilderness areas are generally to be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use. This section of the act specifically directs federal agencies to protect the wilderness character of designated wilderness areas and prohibits certain uses deemed antithetical to the preservation of wilderness character. Permitted and prohibited uses in wilderness are summarized on the following page.

USES AND MANAGEMENT IN WILDERNESS

Although this study is not examining use or management of wilderness, the Wilderness Act and NPS policies permit and prohibit various uses, developments, and actions. These directions need to be considered in evaluating the impacts of the wilderness proposal.

Various recreational uses, management actions, and facilities are permitted in wilderness areas under the Wilderness Act and NPS policies. Among the uses, management actions, and facilities permitted in wilderness areas in national monuments are:

- nonmotorized recreational uses (e.g., hiking, backpacking, picnicking, camping)
- use of motorboats where established use predates wilderness designation
- fishing
- American Indian religious activities and other actions recognized under treaty-reserved rights
- guided interpretive walks and on-site talks and presentations
- use of wheelchairs, service animals, and reasonable accommodations for the disabled that are not in conflict with the Wilderness Act (e.g., barrier-free trails, accessible campsites)
- scientific activities/research
- monitoring programs
- management actions taken to correct past mistakes or impacts of human use, including restoration of extirpated species, controlling invasive alien species, endangered species management, and protection of air and water quality
- fire management activities (including fire suppression)
- protection and maintenance of historic properties eligible for the National Register of Historic Places
- trails
- campsites
- certain administrative facilities if necessary to carry out wilderness management objectives (e.g., storage or support structures, ranger station)
- signs necessary for visitor safety or to protect wilderness resources
- uses and facilities permitted for landowners with valid property rights in a wilderness area

The Wilderness Act also specifically prohibits certain uses and developments. Under sections 2l and 4l of the act, the following uses are not permitted in a wilderness:

- permanent improvements or human habitation
- structures or installations
- permanent roads
- temporary roads
- use of motor vehicles (except motorboats, where specifically authorized by law)
- use of motorized equipment
- landing of aircraft (except for emergency purposes)
- other forms of mechanical transport (e.g., bicycles)
- commercial enterprises (except for commercial services that are necessary for realizing the recreational or other wilderness purposes of the area, such as guiding and outfitting)
- With the exception of permanent roads, the act does recognize that the above uses may be permitted if necessary to meet the minimum requirements for the administration of the area as wilderness or for emergency purposes.

In addition to the above prohibitions, NPS policies also prohibit some developments:

- new utility lines
- permanent equipment caches
- site markings or improvements for nonemergency use
- borrow pits (except for small quantity use of borrow material for trails)
- new shelters for public use
- picnic tables
- interpretive signs and trails and waysides (unless necessary for visitor safety or to protect wilderness resources)

Wilderness Eligibility Assessment

In keeping with the requirements of NPS *Management Policies 2006,* an interdisciplinary NPS team consisting of the monument and Southeast Regional Office staff conducted an evaluation of the monument to determine those areas meeting the criteria for wilderness described in the Wilderness Act. The study area included lands and waters owned by both federal and state governments; however, only federal lands were evaluated for wilderness eligibility. To be eligible for wilderness designation, an area of federal land in the monument had to

- generally appear to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable
- be undeveloped and retain its primeval character and influence, without permanent improvements or human habitation
- be untrammeled by man, where man himself is a visitor who does not remain
- offer outstanding opportunities for solitude or a primitive and unconfined type of recreation
- be protected and managed so as to preserve its natural conditions

The team first examined data to exclude from wilderness consideration lands clearly not meeting one or more of the previously described criteria, such as lands containing permanent improvements, (e.g., buildings, roads, and canals). The remaining lands were evaluated against the criteria and visited as necessary. All lands meeting the criteria and of such size that they could be managed as wilderness were determined to be eligible; all other lands were excluded from further wilderness consideration.

The wilderness eligibility assessment identified about 4,500 acres—approximately 84% of monument total acreage—as meeting wilderness criteria outlined previously and being eligible for wilderness designation (see "Figure 1. Wilderness Eligibility Determination"). Per NPS *Management Policies 2006*, section 6.3.1, the National Park Service will manage these lands to preserve their wilderness character until such time as Congress takes final action either to include or exclude them from the national wilderness preservation system.

Areas that were determined not to be eligible (approximately 865 acres) did not meet wilderness criteria. For more information regarding how the eligibility determination was made, please refer to "Appendix B: Wilderness Eligibility Assessment."

Options Analyzed in the Wilderness Study

All lands found eligible for wilderness designation were subsequently evaluated to determine whether, and if so where, wilderness should be designated within the monument, given the best available information about wilderness character, practical considerations, and public review and comment. As used in this document, the term *proposed wilderness* means an area that has wilderness characteristics and is proposed for wilderness designation by Congress.

Using the overall vision for each action alternative, the planning team investigated a range of possibilities for proposed wilderness. Ultimately, the study team concluded that an identical wilderness proposal, consisting of all lands eligible for designation, should be included in both action alternatives. This determination was based largely on the fact that the salt marsh environment on McQueens Island is more or less uniform throughout and thus any line-drawing to establish alternatives would be essentially arbitrary. Furthermore, none of the eligible land in the salt marsh lends itself to future uses inconsistent with wilderness designation.

Accordingly, this wilderness study proposes that Congress designate as wilderness approximately 4,500 acres of salt marsh on McQueens Island. The area proposed for designation includes all lands previously found eligible for wilderness designation at Fort Pulaski National Monument, except for those lands within 100 feet of the edge of the right-of-way of U.S. Highway 80. This environmental impact statement analyzes the environmental consequences of this proposal.

This wilderness proposal, if finalized, will be forwarded to the president via the director of the National Park Service and the Secretary of the Interior. Both the director and the secretary will review the proposal and make adjustments, as appropriate. The Secretary of the Interior will then be responsible for recommending to the president those lands that are suitable or not suitable for inclusion in the national wilderness preservation system. After receiving the secretary's recommendation, the president will transmit his final recommendations with respect to wilderness designation to both houses of Congress.

Until Congress acts on the president's recommendations, the National Park Service will manage all *eligible* lands—whether recommended for designation or not—in such a way as to protect their wilderness character and preserve their eligibility for future designation.

Management of Proposed Wilderness

Planning. NPS policies governing wilderness management apply equally to proposed and designated wilderness (see NPS *Management Policies 2006*, section 6.3.1). In order to guide the preservation, management, and use of NPS wilderness areas, including proposed wilderness, a wilderness or backcountry management plan is typically developed. Such a plan would be developed for Fort Pulaski with public involvement and would contain measurable objectives for preservation of wilderness values as specified in the Wilderness Act and NPS management policies. Wilderness management plans articulate management actions such as regulations, monitoring, and permit systems.

Management decisions affecting proposed wilderness will be consistent with the "minimum requirements" determination process. This is a documented process used to determine whether administrative activities affecting wilderness character visitor experiences are necessary in wilderness, and if so, how the impacts from such activities can be minimized. The process requires managers to consider alternative approaches for accomplishing necessary tasks in wilderness, and provides a mechanism for determining the "minimum requirement" or "minimum tool" for accomplishing those tasks.

Recreational Use. Recreational uses of NPS wilderness are to be of a type and nature that enable areas to retain their undeveloped character and influence, protect and preserve natural conditions, leave the imprint of humans' work substantially unnoticeable, ensure that other visitors have outstanding opportunities for solitude or primitive and unconfined types of recreation, and preserve wilderness in an unimpaired condition. Canoeing, kayaking, and fishing are appropriate uses of wilderness at Fort Pulaski National Monument. Under the wilderness proposal described herein, motor boating would also be an appropriate and allowed recreational activity in those areas where it is already an established use (see 16 USC § 1133 (d)(1)). However, this use would have to be specifically authorized by Congress at the time it is designated wilderness at Fort Pulaski National Monument.

Emergency Services. In emergency situations involving human health and safety the use of aircraft, motorboats, and other motorized or mechanical equipment is allowed in wilderness. Wildfires will be controlled as necessary to prevent loss of

life, damage to property, the spread of wildfire to lands outside wilderness, or unacceptable loss of wilderness values. The use of tool caches, aircraft, motorboats, and motorized firefighting equipment may be permitted for such control. Prescribed fire and hazard fuel reduction programs may be implemented according to approved plans. The minimum requirement determination process will be followed for all fire activities in wilderness.

Resource Management and Research. Wilderness designation does not prevent the National Park Service from protecting and maintaining historic and other cultural resources located within wilderness areas. Using the minimum requirement process, these resources will be protected and maintained according to the pertinent laws, policies, and plans governing cultural resources. Natural resource management activities may be carried out in a similar fashion, and will generally be undertaken only to address the impacts of past or current uses or influences originating outside wilderness boundaries. Natural processes will be allowed, insofar as possible, to shape and control wilderness ecosystems.

Scientific activities are appropriate in wilderness. Even activities that involve a potential impact to wilderness resources or values (such as inventory, monitoring, and research) are allowed when the benefits of what can be learned outweigh the impacts on wilderness resources or values. However, all such activities must be evaluated using the minimum requirement determination process.

MCQUEENS ISLAND MARSHES

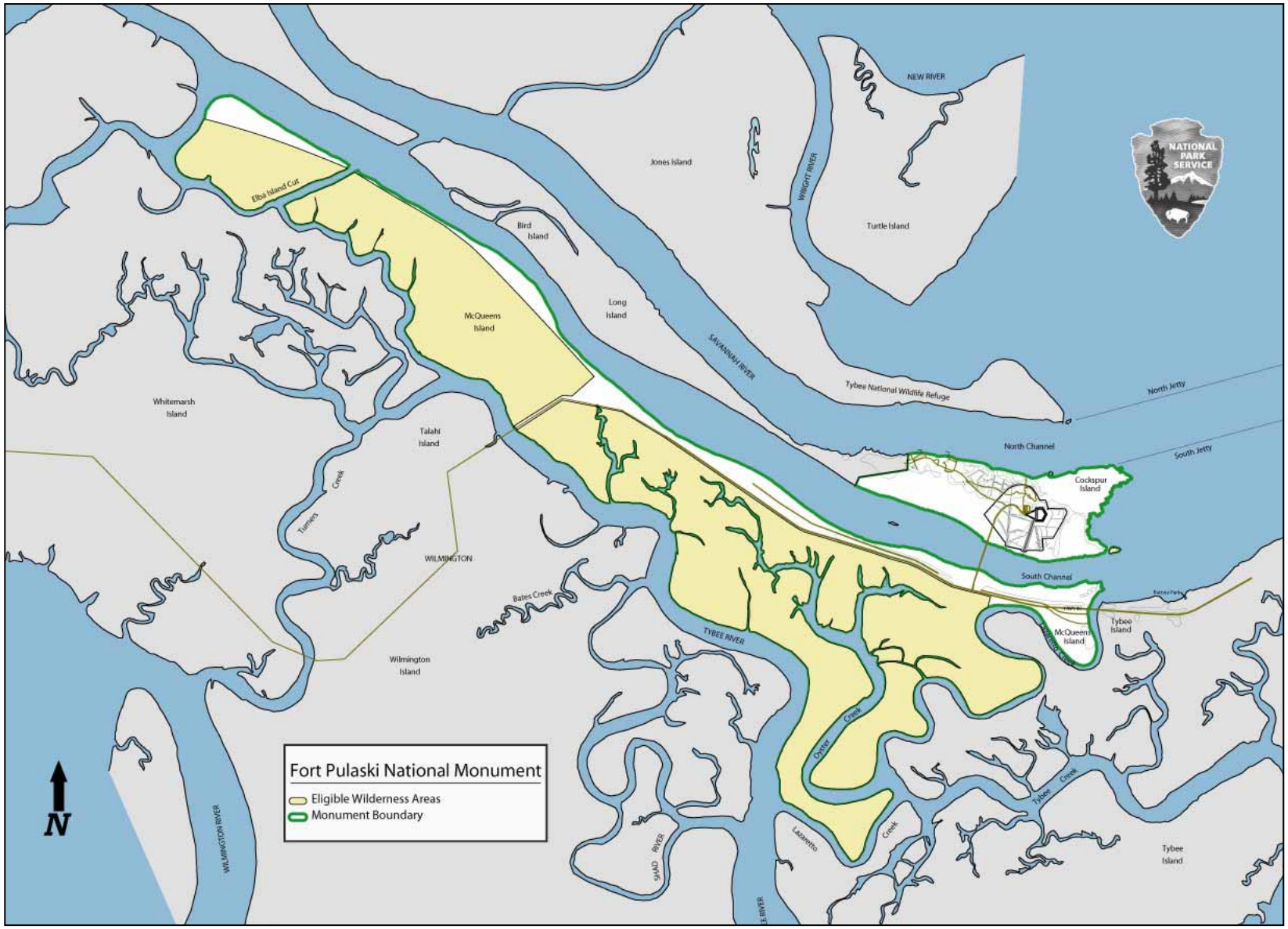


FIGURE 1. WILDERNESS ELIGIBILITY DETERMINATION

USER (CARRYING) CAPACITY

General management plans for national park system units must address user capacity management. The National Park Service defines user capacity as the type and extent of use that can be accommodated while sustaining the quality of a park unit's resources and visitor experiences consistent with the park unit's purpose.

User capacity management involves establishing desired conditions, monitoring, and taking actions to ensure the park unit's values are protected. The premise is that with any visitor use comes some level of impact that must be accepted; therefore, it is the responsibility of the National Park Service to decide what level of impact is acceptable and what management actions are needed to keep impacts within acceptable limits.

Instead of just tracking and controlling the number of visitors, NPS staff manages the levels, types, and patterns of visitor use as needed to preserve the condition of the resources and quality of the visitor experience. The monitoring component of this process helps NPS staff evaluate the effectiveness of management actions and provides a basis for informed management of visitor use.

The foundation for user capacity decision making is the qualitative description of desired resource conditions, visitor experience opportunities, and general levels of development and management described in the management zones. Based on these desired conditions, indicators and standards are identified. An indicator is a measurable variable that can be used to track changes in resource and social conditions related to human activity, so that existing conditions can be compared to desired conditions. A standard is the minimum acceptable condition for an indicator.

User capacity decision making is a continuous process; decisions are adjusted based on monitoring the indicators and standards. Management actions are taken to minimize impacts when needed. The indicators and standards included in this management plan would generally not change in the future. However, as monitoring of the park's conditions continues, managers may decide to modify, add, or delete indicators if better ways are found to measure important changes in resource and social conditions. Information on NPS monitoring efforts, related visitor use management actions, and any changes to the indicators and standards would be available to the public.

This *General Management Plan / Wilderness Study / Environmental Impact Statement* addresses user capacity in the following manner:

- The management zones described earlier in this chapter provide the basis for managing user capacity. Each zone prescribes desired resource conditions, visitor experiences, and recreational opportunities for different areas of the monument. The zones also prescribe the types and levels of development necessary to support these conditions, experiences, and opportunities. This element of the framework is the most important to long-term user capacity management in that it directs the National Park Service on how to best protect resources and visitor experiences while offering a diversity of visitor opportunities.
- The general management plan describes the monument's most pressing use-related resource and visitor experience concerns, existing and potential, given the monument's purpose, related desired conditions, and the vulnerability of specific resources and values. This helps NPS managers focus limited resources on the most significant indicators.
- Table 3 identifies indicators and standards that will be monitored to determine if desired conditions are not being met due to unacceptable

impacts from visitor use and also provides representative examples of management strategies that might be used to avoid or minimize unacceptable impacts from visitor use.

- The user capacity analysis establishes priorities for monitoring attention, if appropriate.

TABLE 3. INDICATORS AND STANDARDS

Indicator	Applicable Zone	Standard	Management Strategies
Indicator Topic: Vehicle safety and congestion at the entrance road (e.g., wait times for visitors to turn into the monument, back-ups onto U.S. Highway 80 from the entrance gate, accidents as a result of having no turn lanes, no acceleration/deceleration lanes, and limited sight distance)			
Number of cars waiting at the monument entrance	Visitor Services Zone	No more than two tour buses or five to six personal vehicles lined up in a lane* *based on current entry configuration	Pretrip planning information to encourage voluntary redistribution of use to off-peak days and times Real- time information about the wait time at the monument entrance Increased staff to attend to vehicles within the monument to aid queuing and fee collection at the entrance Additional temporary entrance lanes Increased coordination with the Department of Transportation and other partners to redesign the entry and manage traffic and speeds on U.S. Highway 80
Incidences of accidents associated with the entrance to the monument	Visitor Services Zone	No more than one accident per year	Pretrip planning information to encourage voluntary redistribution of use to off-peak days and times Site management (e.g., vegetation clearing) Increased staff to attend to vehicles within the monument to aid queuing and fee collection at the entrance Increased coordination with Department of Transportation and other partners to redesign the entry and manage traffic and speeds on U.S. Highway 80
Indicator Topic: Organized group conflicts in the fort (e.g., if two or more groups overlap, impacts such as noise and crowding can result, so groups need to remain dispersed throughout the fort), including impacts from unmanaged behavior in organized groups (e.g., noise, depreciative behavior)			
Number of organized groups in any area of the fort at one time	Historic Setting Zone	One organized group per designated area	Pretrip planning information, including targeted contact with organized groups Coordinate the arrival (day and time) and distribution of organized groups within the monument via a reservation system On-site contact with individual visitors and groups to provide information and direct use in order to avoid conflicts Roving staff for orientation and information

TABLE 3. INDICATORS AND STANDARDS

Indicator	Applicable Zone	Standard	Management Strategies
Number of chaperones to minors in organized groups	Historic Setting Zone	One chaperone per ten minors in organized groups	Pretrip planning information, including targeted contact with organized groups Continue to require advanced reservations and contact with monument staff Provide chaperone support, if available
Number of groups showing up without a reservation	Historic Setting Zone	No more than two unannounced groups per day	Pretrip planning information, including targeted contact with organized groups Continue to require advanced reservations Increased staffing and coordination to distribute groups throughout the monument to avoid crowding and conflicts
People at one time at the visitor center	Visitor Services Zone	No more than 100 people at one time at the visitor center* *based on current building configuration	Pretrip planning information to encourage voluntary redistribution of use to off-peak days and times Advanced reservations and coordination of organized groups Increased staffing and coordination to distribute visitor use on-site
Incidences of unauthorized parking of buses	Visitor Services Zone	No unauthorized bus parking allowed	Education on regulations Enforcement of regulations
Indicator Topic: Impacts associated with the lighthouse as a result of improved access to the site (e.g., damage, wear, crowding, safety incidences)			
Degree of wear or incidences of damage to the lighthouse structure (stairs, walls, guardrail, etc.)	Historic Setting Zone	No noticeable / significant wear* or damage to the lighthouse structure *as evaluated by regular cultural resource evaluations of trained personnel	Education on safety concerns and appropriate behaviors Site management to enhance durability and prevent damage that is consistent with maintaining the site's integrity Regulating access (e.g., limiting the amount of use, guided only access) Temporary or permanent closure
Incidences of reported visitor accidents associated with accessing the lighthouse, within NPS jurisdiction	Historic Setting Zone	No more than five reported accidents per year associated with accessing the lighthouse	Education on safety concerns and appropriate behaviors Site management to enhance safety that is consistent with maintaining site integrity Regulating access (e.g., limiting the amount of use, guided only access) Temporary or permanent closure
Indicator Topic: Incidences of unsafe and depreciative behavior (e.g., sitting/climbing on cannons, fort walls, earth mounds), including incidences of graffiti (e.g., adding current names/dates to historic graffiti wall)			
Incidences of observed unsafe and depreciative behavior (graffiti, theft, sitting/climbing on cannons, fort walls, earth mounds)	Historic Setting Zone	No incidences of observed unsafe and depreciative behavior	Education on appropriate behaviors (signage kept to a minimum, with an emphasis on direct contact and publications) Regulations Temporary or permanent physical barriers Temporary or permanent closures

MANAGEMENT ZONES FOR FORT PULASKI NATIONAL MONUMENT

Management zones are descriptions of desired conditions for monument resources and visitor experiences in different areas of the monument. Management zones are determined for each national park system unit; however, the management zones for one unit will probably not be the same for any other national park system unit (although some might be similar). The management zones identify the widest range of potential appropriate resource conditions, visitor experiences, and facilities for the monument that fall within the scope of the monument's purpose, significance, and special mandates. Five management zones have been developed for Fort Pulaski National Monument. It is important to note that the names of the zones are only general indications of their character. For example, the name Historic Setting Zone should not be interpreted to mean that there are no natural resources within the zone, nor does the name Natural Resource Preservation Zone imply that cultural resources either do not exist or will not be preserved within the zone. The details of how the zones will be managed and the conditions to be achieved are spelled out in table 4, which follows.

In formulating the action alternatives (alternatives B and C), management zones were placed in different locations or configurations on a map of the monument according to the overall intent (concept) of each of the alternatives. (Because alternative A represents existing conditions, and there are no existing management zones, the alternative A map does not show the management zones.) Please note that privately owned properties are not zoned, even if they are within the authorized national monument boundary.

AERIAL PHOTO OF FORT PULASKI

TABLE 4. MANAGEMENT ZONE DESCRIPTIONS FOR FORT PULASKI NATIONAL MONUMENT

	Visitor Services Zone	Administrative Services Zone	Historic Setting Zone	Natural Resource Preservation Zone	Recreation Zone
Desired Resource Conditions	• Necessary visitor facilities in this zone would be placed as unobtrusively as possible in an appropriate setting. • The area would be modified for visitor access and monument operations in a way that aesthetically blends with the natural and cultural environment.	• Nonhistoric elements such as maintenance facilities, administrative offices, and facilities of cooperating partners would predominate in this type of zone. • Minimizing the impacts of these facilities on the natural and cultural resources of the national monument would be a high priority. • A moderate level of native, noninvasive landscape plantings such as grass, shrubs, small trees, flowers, and ground covers could be introduced and maintained to improve the visual appeal of the structures.	• Cultural resources in this zone could accommodate expanded visitor use while maintaining historic resource integrity and while representing the period of significance to the greatest degree feasible. • Some resources would be stabilized at the existing condition. • Restoration and maintenance of the historic scene could occur while screening for modern intrusions. • There would be minimum tolerance for adverse visitor impact.	• This zone would remain an undisturbed, nearly pristine natural environment. • It would be carefully protected from resource degradation. • Some modification could occur to prevent resource degradation. • Generally, the area would exhibit the free play of natural forces and natural ecosystem succession.	• This area would provide opportunities for visitors to recreate, yet resources would remain largely intact. • The environment might be adapted for access and human use. • Sounds and sights of human activity might be apparent. • There would be tolerance for minor resource impacts.
Desired Visitor Experience	• This area would provide for a high level of visitor activity and administrative operations. • In this zone visitors would enter the national monument and they would have opportunities to receive orientation and information, interact with monument staff and other visitors, and experience and learn about the monument's physical resources and interpretive themes.	• Visitors would not typically enter this zone. • Should they enter, either unintentionally or to obtain information or assistance, they might encounter maintenance or administrative buildings, equipment, machinery in operation, loud sounds, and monument staff.	• Observation, education, reflection, and learning would be the primary visitor experiences desired. • Living history demonstrations and interpretive programs could occur in this zone. • Visitors could also find the opportunity for solitary, individual exploration and discovery, quiet, and reflective experiences. • Appropriate recreational activities would be permitted.	• The visitor would perceive the area to be undisturbed and essentially natural. • Visitors would appreciate the beauty of the area and gain new understanding of the forces of nature in the coastal environment. • Access would be limited to waterways and designated trails. • The probability of seeing or encountering other visitors or monument staff would be low most of the time.	• Visitors would have a variety of opportunities to participate in recreational activities and interpretive programs. • Providing opportunities for people to interact with the resources in this area would be important. • The probability of seeing or encountering other visitors or monument staff would range from low to moderate most of the time.

TABLE 4. MANAGEMENT ZONE DESCRIPTIONS FOR FORT PULASKI NATIONAL MONUMENT

	Visitor Services Zone	Administrative Services Zone	Historic Setting Zone	Natural Resource Preservation Zone	Recreation Zone
Appropriate Kinds and Levels of Development	• A visitor center with restrooms, drinking water fountains, museum, fee-collection facility, roads, parking, and walkways are the types of facilities found in this zone.	• The facilities found in this zone could include maintenance buildings, vehicle storage facilities, monument offices, roads, parking areas, utilities, and artifact storage buildings as well as facilities, monument housing, and equipment storage structures of cooperating partners.	• The minimum development necessary for visitor access, safety, resource protection, and interpretive purposes would occur in this zone. • Development could include signage, trails, pathways, benches, or other appropriate facilities.	• There would be no buildings, comfort stations, or other structures in this zone. • Some trails or interpretive markers would be possible in less environmentally sensitive areas.	• There would be specialized facilities or structures dedicated for recreational uses in this zone. • There could be trails, campgrounds, parking areas, or comfort stations in this zone. • Additions to the landscape, including signs, markers, fishing piers, boat ramps, and accessibility features, might be used to enhance visitor experience and public safety and to protect resources.
Appropriate Kinds and Levels of Management Activities	• Management activities could include regular maintenance of both the structural and landscape elements in the zone, fee collection, interpretive services, and law enforcement.	• Moderate to intensive management in this zone would be directed toward maintenance of its buildings and grounds as well as staging and preparation for maintenance and resource protection activities in other zones.	• Management activities that could occur in this zone include interpretation, grounds maintenance, preservation, restoration, stabilization, visitor protection and law enforcement, and archeological investigations. • Adaptive use of some cultural resources would also be permitted in this zone.	• Management activity in this zone would be minimal, only as necessary to maintain natural appearance and/or protect resources from degradation, protect areas from negative visitor impact, and occasionally remove nonnative species to promote the health of the natural ecology. • Cooperation with other entities having jurisdiction over natural resources would be an important aspect of management in this zone.	• Management actions would focus on enhancing visitor experience and safety, protecting resources, and minimizing impacts from visitor use. • Appropriate management actions could include the following: – determining types and levels of use (carrying capacity) – managing access based on the determined carrying capacity – conducting research and restoring and stabilizing resources

TABLE 4. MANAGEMENT ZONE DESCRIPTIONS FOR FORT PULASKI NATIONAL MONUMENT

	Visitor Services Zone	Administrative Services Zone	Historic Setting Zone	Natural Resource Preservation Zone	Recreation Zone
Appropriate Kinds and Levels of Visitor Activities	• Visitor activities could include entering the national monument grounds, paying fees, and receiving orientation to the resources and programs of the national monument.	• Visitors would not typically enter this zone except to obtain information or assistance.	• Typical visitor activities in this zone could include participating in interpretive programs, viewing resources and interpretive displays, photography, and appropriate recreational pursuits.	• Visitor activities would be limited to low-impact activities such as kayaking/canoeing, bird watching, photography, and recreational fishing and shellfish harvesting. • Use levels would probably remain low and would be monitored to assure achievement of zone objectives.	• Appropriate visitor activities could include sightseeing, picnicking, camping, boat launching, fishing, hiking, etc. • Visitor activities might be self directed or they might use interpretive services to plan their activities.

FORT PULASKI AREA MARSH

ACTIONS COMMON TO ALL ALTERNATIVES

U.S. Highway 80 Bridges Replacement Study and Project Response

The National Park Service will continue to participate in the planning and environmental analysis for this proposed project with the goal of minimizing and mitigating any impacts that would result.

Savannah Harbor Response

The National Park Service will continue to participate in the planning and environmental analysis for this proposed project with the goal of minimizing and mitigating any impacts that would result, especially impacts on the northern shoreline of Cockspur Island and the impacts on the foundation of the Cockspur Island Lighthouse.

Visitor Center Annex

Fort Pulaski management proposes to construct a visitor center annex designed for monument visitors, school groups, and staff. This structure would be designed to be technologically current and environmentally friendly and sustainable. In addition to having telecommunications network capabilities, it would provide connections for computers, technical, and audio/visual equipment. This, in addition to the space itself, would make the building ideal for both educational and interpretive programs, lectures, public presentations, staff meetings, staff training, and video conferencing. The existing visitor center is inadequate in size for the current annual monument visitation, which has increased by about 60% since it was built, and inadequate for the types of presentations, exhibits, and programs that today's visitors expect.

The specific dimensions, building footprint, and other design parameters will be determined in a future planning project. The location will be in close proximity to the existing visitor center in order to facilitate a complete experience including touring the fort, enjoying programs and demonstrations in the fort, and viewing exhibits and educational/interpretive programs in the expanded visitor center, a short walk from the fort.

Nonnative Species Management

National monument staff members actively manage and document nonnative species through an internal monument natural resources program and with assistance from the Southeast Coast Exotic Plant Management Team (SEC-EPMT) and the Southeast Coast Network Inventory and Monitoring Program (SECN I&M).

The main nonnative species populations currently being managed through eradication treatments are lantana (*Lantana camera*), Chinaberry (*Melia azedarach*), Chinese tallow (*Triadica sebifera*), and Japanese honeysuckle (*Lonicera japonica*). Past treatments also included Chinese privet (*Ligustrum sinese*) and crapemyrtle (*Lagerstroemia indica*).

The monument management will consider reporting occurrences of invasive species to the Early Detection and Distribution Mapping System developed by the Center for Invasive Species and Ecosystem Health at the University of Georgia. Fort Pulaski National Monument management understands that early detection and rapid response are crucial in keeping nonnative species from displacing natural resources and/or natural processes, impacting cultural resources and landscapes, etc.

ALTERNATIVE A: THE NO-ACTION ALTERNATIVE

Concept

The primary purpose of the no-action alternative, required by the National Environmental Policy Act, is to serve as a baseline for comparing the effects of the action alternatives to the effects of the status quo. The no-action alternative is the continuation of current management actions and direction into the future, i.e., continuing with the present course of action until that action is changed. "No action" does not mean that the monument does nothing. Rather, the no-action alternative presents how monument staff would continue to manage natural resources, cultural resources, and visitor use and experience if a new general management plan was not approved and implemented.

The no-action alternative is a viable course of action and must be presented as an objective and realistic representation of continuing the current monument management direction; otherwise, it will not be an accurate baseline against which to compare action alternatives and their potential impacts.

The monument's enabling legislation and NPS management policies would provide guidance for all of the alternatives. The monument would continue to be managed as it is today, with no major change in management direction (see alternative A map).

Wilderness

A wilderness eligibility assessment has been conducted to evaluate the McQueens Island marshes for eligibility to be included within the national wilderness preservation system. The assessment identified approximately 4,500 acres of eligible land; however, under the no-action alternative, no lands are proposed for wilderness designation by Congress. Per NPS *Management Policies 2006,* the National Park Service will manage these lands to preserve their wilderness character.

Natural Resources

- Vegetation would be maintained in its present condition with the exception of removal of dead, diseased, or hazardous trees, and invasive nonnatives and fuel removal in accord with the approved fire management plan.
- Tidal salt marshes: natural processes would continue except for shoreline erosion control measures and mitigation for U.S. Highway 80 and Savannah Harbor projects.
- Other wetlands: natural processes would continue; mosquito control would be managed through biological controls.
- Uplands: biological mosquito control and grounds maintenance would continue as currently practiced.
- Wildlife: the monument would request a deer management plan or study.
- Nonnatives: the monument would continue nonnative plant management with volunteers and staff as resources become available.

Cultural Resources

- Current management of cultural resources would continue. This includes the use of a fee demonstration project involving a partnership between monument maintenance staff and graduate and undergraduate students majoring in historic preservation from the Savannah College of Art and Design to form a preservation team.
- Under an approved curatorial facilities plan, Fort Pulaski's museum collections would be collocated with

the collections of Fort Frederica and Ocmulgee national monuments in Macon, Georgia, in a facility associated with these monuments (new, rented, or revamped existing facility—the details of the facility and the operations have not been finalized). This would allow the Bally building to be removed from the fort and to get the stored collections away from the coast to mitigate potential natural disasters such as hurricanes.

- As a result of the U.S. Highway 80 bridges replacement project, federal legislation might become necessary to authorize a potential boundary adjustment and/or land exchange with the Georgia Department of Transportation. As mitigation for the impact on the monument the National Park Service would seek to obtain state land adjacent to the monument boundary that contains seven World War II historic structures and Battery Hamilton.
- A fee management program would provide opportunities for deferred maintenance projects, such as:
  - repointing masonry structures
  - repairing and maintaining historic structures
  - implementing the long-range interpretive plan to include updating of furnishing plan and furnishings in casemates

Visitor Use and Experience

Current programs and opportunities would be continued.

- Visitors would enter the visitor center to obtain basic information and view an orientation film, then walk to the fort and explore on their own.
- Living history demonstrations and other interpretive programs would continue on a scheduled basis.
- Access for fishing, walking, biking, and other appropriate activities would remain as currently available.

Access

Current access to the monument via the bridge over the South Channel Savannah River would be maintained. Repairs to correct deteriorating structural conditions are currently in the preliminary design stage. These repairs would be expected to extend the usable life of the bridge for another 30 to 35 years.

Boundary Expansion

As a result of the proposed U.S. Highway 80 bridges replacement project, the national monument boundary may be expanded to include Bird Island/Long Island as well as the west end of Cockspur Island. (The Georgia Department of Transportation has proposed mitigating use of monument land for the U.S. Highway 80 project by transferring the west end of Cockspur Island and Bird Island/Long Island to the National Park Service. Congressional legislation would be required to authorize this boundary expansion).

Battery Halleck, on Tybee Island, is the only known remaining undisturbed federal battery site. The acquisition of this site would help complete the ability of the national monument to interpret the entire story of the siege and reduction of Fort Pulaski. However, the land is currently in private ownership. Fort Pulaski National Monument has no authority to acquire any land on Tybee Island except by donation, so a third party, such as a land conservation trust, would have to acquire the property from the owner, assuming a willing seller, and then donate the land to the monument.

Interpretation

The monument would continue implementation of the approved long-range

interpretive plan. Specifics include the following:

- adaptive use of some fort casemates, such as converting the ranger office to a sales outlet "sutlery," where visitors could purchase period reproductions, reprints, and other interpretive items directly related to the fort and its themes
- restored interpretive personal services program (talks, demonstrations, special events) in the fort
- improvements to the parking lot and visitors' approach to the visitor center and the fort interior

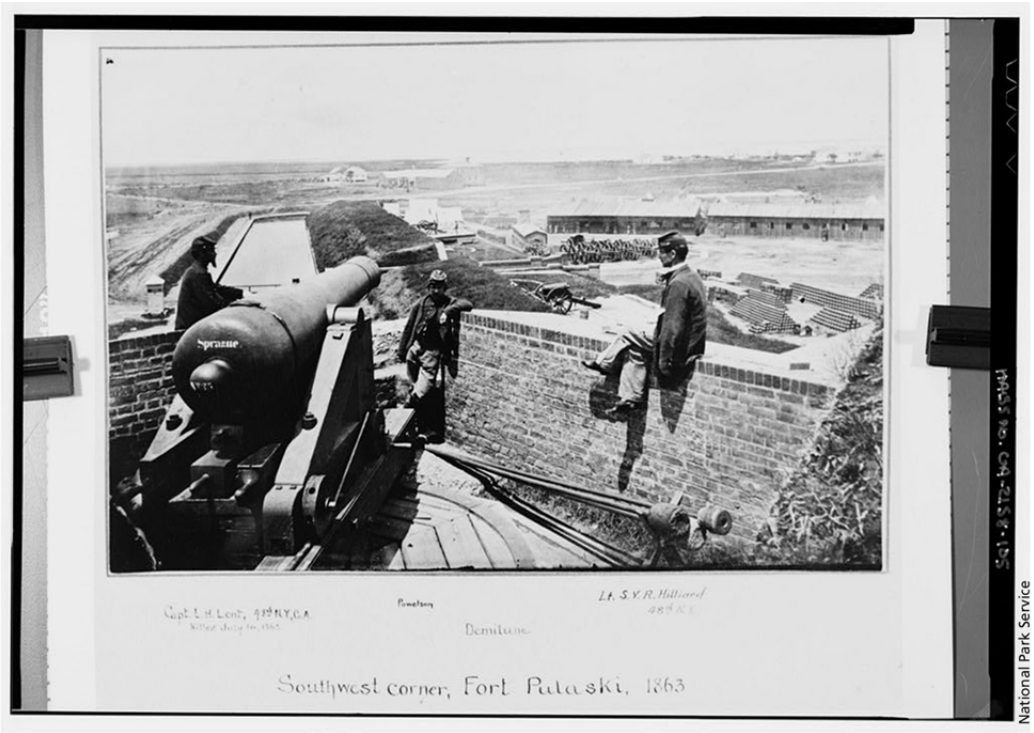
Trails

The existing trail system would be maintained and work with the Georgia Department of Transportation, Chatham County, the city of Savannah, and the city of Tybee Island to extend the McQueens Island bike trail from its current end at the entrance to Fort Pulaski across the Lazaretto Creek Bridge to Battery Park on Tybee Island would be continued.

Viewshed and Vistas

A viewshed is an area of land, water, and/or other environmental or cultural elements that is visible from a fixed vantage point. Viewsheds tend to be areas of particular scenic or historic value that are deemed worthy of preservation against development or other change.

At Fort Pulaski the principal viewshed of historical interest would be the view from the fort to the location of the federal batteries on Tybee Island and vice versa. Under the no-action alternative, Fort Pulaski would maintain current viewsheds, none of which are historically accurate. Because there would be no change from current conditions and the zones that have been developed for alternatives B and C would not be applied to the landscape, the monument boundary map (figure 2) is essentially the map for the no-action alternative.



FORT PULASKI SOUTHWEST CORNER GUN DECK, 1863

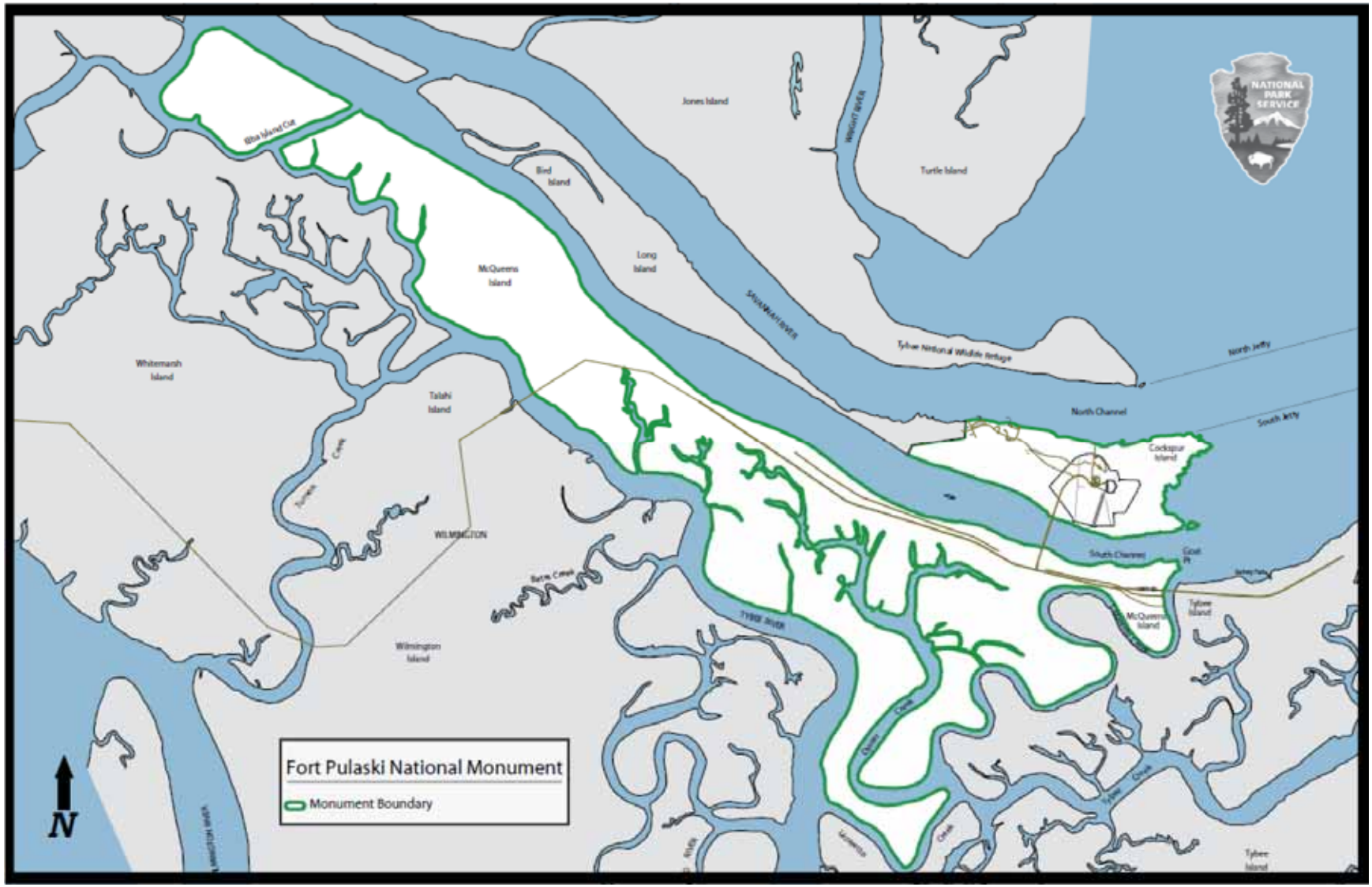


FIGURE 2. MONUMENT BOUNDARIES

ALTERNATIVE B (NPS PREFERRED ALTERNATIVE)

Concept

Fort Pulaski would be managed to focus on the April 1862 period of significance in terms of the landscape and interpretive programs. The federal siege and reduction of the fort using rifled cannon, the hasty surrender of the Confederate forces, and the story of the "Immortal Six Hundred" would be paramount.

- Selected vegetation would be removed to facilitate understanding of Fort Pulaski's field of fire as a defensive coastal fort and to better understand the sight lines during the historic battle.
- This alternative would emphasize to a high degree the restoration, preservation, and interpretation of historic landscapes and viewsheds of the site for the purpose of providing visitors a greater understanding of the siege and reduction of Fort Pulaski in 1862. There would be mitigation for tree loss.
- The visitor center parking lot would be removed and the site returned to the approximate landscape condition that existed during the principal period of significance (April 1862).
- The visitor center parking lot would be relocated to a site near the visitor center but outside the viewshed from the top of the fort. The relocated parking lot would be just as near to the visitor center and just as accessible as the current one. There would be mitigation for tree loss.
- The current facilities and opportunities would be maintained for recreation. Future facilities and opportunities would facilitate a greater understanding of the siege and reduction of the fort.

Wilderness

As part of the general management plan process, the National Park Service conducted a wilderness eligibility assessment to determine whether any lands at Fort Pulaski National Monument are eligible for inclusion in the national wilderness preservation system. This assessment identified approximately 4,500 acres of eligible land within the monument boundary (see figure 2 and appendix B). All eligible lands at Fort Pulaski are located on McQueens Island and consist of salt marsh. The National Park Service subsequently initiated a formal wilderness study to analyze these eligible lands in depth and to determine which lands should be proposed for wilderness designation. This study, summarized previously, found that all eligible lands in the monument should be proposed as wilderness, except for those lands within 100 feet of the right-of-way of U.S. Highway 80.

Under alternative B, all lands identified as eligible in the wilderness eligibility assessment are proposed for designation as wilderness, except for those lands within 100 feet of the edge of the right-of-way of U.S. Highway 80. If finalized and approved by Congress, this proposal would result in approximately 4,500 acres of salt marsh receiving permanent protection as wilderness. Per NPS *Management Policies 2006,* the National Park Service will manage these lands to preserve their wilderness character until the legislative process has been completed.

Natural Resources

- Tidal salt marshes: Same as alternative A.
- Other wetlands: Same as alternative A.
- Uplands: In accordance with the recommendations of an approved cultural landscape report, selected vegetation would be removed to

facilitate understanding of Fort Pulaski's field of fire as a defensive coastal fort and to better understand the sight lines during the historic battle.

- To mitigate the loss of selected mature trees and other vegetation from the cultural landscape inside the dike system, the National Park Service would
  - replace mature trees outside the dike system on Cockspur Island on a two for one basis
  - remove mature red cedars only as they succumb to disease, lightning damage, etc.
  - remove trees, using a certified arborist, after they are marked by a surveyor and forester, in consultation with a cultural landscape specialist, to ensure that no more trees are removed than necessary to achieve the desired sightlines
  - prepare a mitigation plan that would include a young tree maintenance plan that involves weekly watering for the first 2 years
- Screening would remain to block the view of the Lazaretto Creek Bridge and modern development on Tybee and Cockspur islands within view of Fort Pulaski.
- Wildlife: Same as alternative A.
- Nonnatives: Same as alternative A

Cultural Resources

Same as alternative A plus:

- The larger Historic Setting Zone in this alternative would permit restoration of some cultural landscapes in accord with an approved cultural landscape report to be completed following the completion and final approval of the general management plan.

Visitor Use and Experience

Visitor understanding and appreciation of the monument's significance would be enhanced by restoring most historic site conditions and views.

- In accordance with the recommendations of the approved cultural landscape report, selected vegetation would be removed to facilitate understanding of Fort Pulaski's field of fire as a defensive coastal fort and to better understand the sight lines during the historic battle.
- To mitigate the loss of selected mature trees and other vegetation from the cultural landscape inside the dike system the National Park Service would
  - replace mature trees outside the dike system on Cockspur Island on a two for one basis
  - remove mature red cedars only as they succumb to disease, lightning damage, etc.
  - remove trees, using a certified arborist, after they are marked by a surveyor and forester, in consultation with a cultural landscape specialist, to ensure that no more trees are removed than necessary to achieve the desired sightlines
  - prepare a mitigation plan that includes a young tree maintenance plan that involves weekly watering for the first 2 years
- Screening would remain to block the view of the Lazaretto Creek Bridge and modern development on Tybee and Cockspur islands within view of Fort Pulaski.

Access

Same as alternative A.

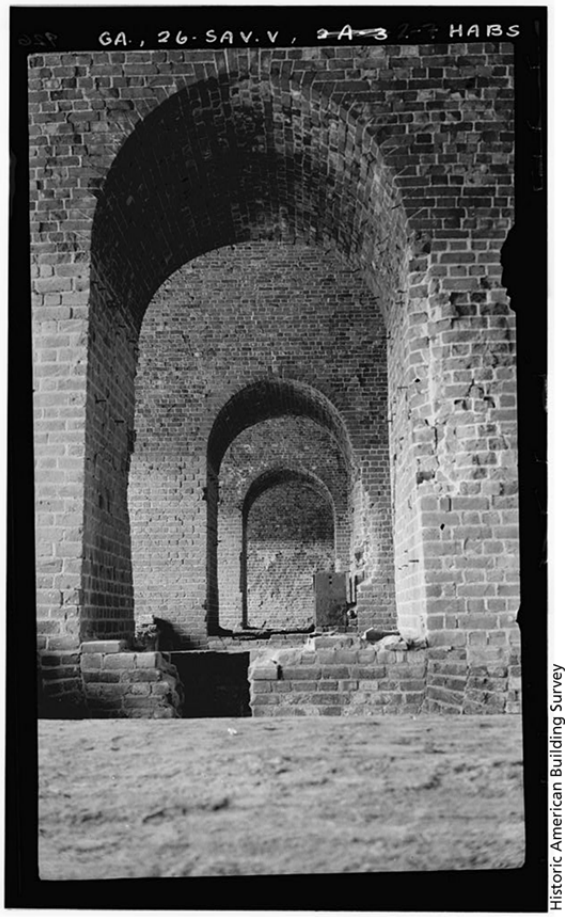
Boundary Expansion

Same as alternative A.

Interpretation

Same as alternative A with the following additions:

- Improved sight lines to the Union batteries would enable interpreters to more effectively convey aspects of the strategy of the siege and reduction than can be explained under current conditions.
- Improved sight lines to the Savannah River (both north and south channels) would enable interpreters to more effectively describe the strategic location of the fort and how it defended the Port of Savannah.
- Increased research on American Indian habitation, construction of the fort, and the role of Fort Pulaski in the Underground Railroad would enhance the interpretation of these important stories.



Historic American Building Survey

FORT PULASKI INTERIOR ARCHES

Trails

Same as alternative A.

Viewshed and Vistas

- In accordance with the recommendations of the approved cultural landscape report, selected vegetation would be removed to facilitate understanding of Fort Pulaski's field of fire as a defensive coastal fort and to better understand the sight lines during the historic battle.
- To mitigate the loss of selected mature trees and other vegetation from the cultural landscape inside the dike system, the National Park Service would
  - replace mature trees outside the dike system on Cockspur Island on a two for one basis
  - remove mature red cedars only as they succumb to disease, lightning damage, etc.
  - remove trees, using a certified arborist, after they are marked by a surveyor and forester, in consultation with a cultural landscape specialist, to ensure that no more trees are removed than necessary to achieve the desired sightlines
  - prepare a mitigation plan that includes a young tree maintenance plan that involves

weekly watering for the first 2 years

- Screening would remain to block the view of the Lazaretto Creek Bridge and modern development on Tybee and Cockspur islands within view of Fort Pulaski.

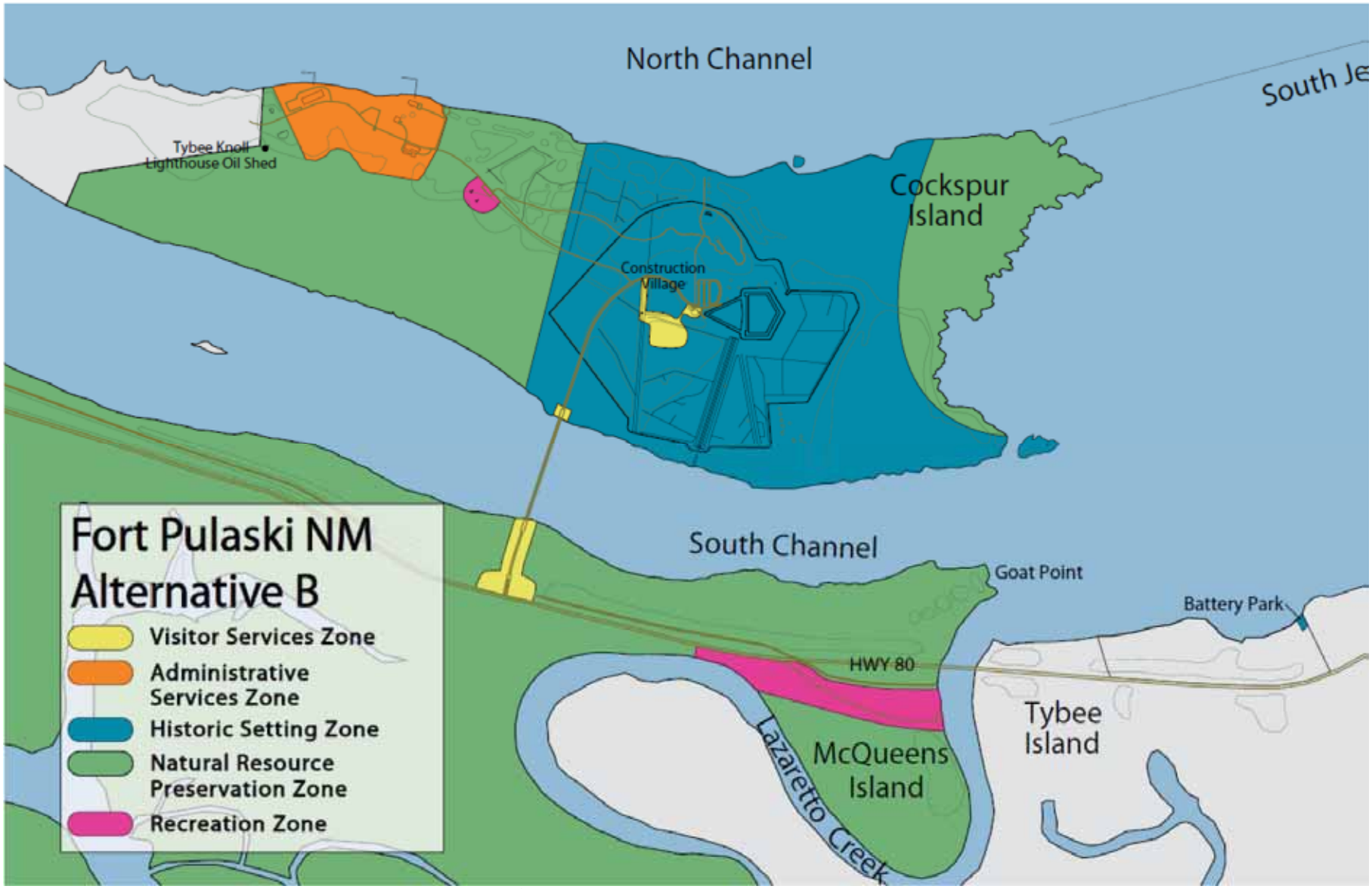


FIGURE 3. ALTERNATIVE B MANAGEMENT ZONES

ALTERNATIVE C

Concept

Fort Pulaski would be managed with a much broader interpretive mandate than in alternative B. This would include a wider range of themes and historic periods as well as natural resource themes.

- Only minor changes from existing conditions would be made to restore historic views. There would be mitigation for tree loss.
- Appropriate recreational activities and facilities within the monument would be allowed to expand.

Wilderness

Same as alternative B.

Natural Resources

- Tidal salt marshes: Same as alternative A.
- Other wetlands: Same as alternative A.
- Uplands: In accordance with recommendations of the cultural landscape report, vegetation would be removed to better understand the sight lines during the historic battle (from the Union batteries at Goat Point to Fort Pulaski). This alternative removes less vegetation than alternative B. Mitigation measures would be the same as in alternative B.
- Wildlife: Same as alternative A.
- Nonnatives: Same as alternative A.

Cultural Resources

Same as alternative B with the following additions:

- Tybee Knoll Lighthouse oil shed would be stabilized.
- Access to Cockspur Island Lighthouse would be provided.
- The smaller Historic Setting Zone in this alternative would permit restoration of cultural landscapes, in accord with an approved cultural landscape report, within the historic dike system and some vista clearing between the southeastern wall of the fort and the federal battery exhibit on Tybee Island to enhance interpretation of the siege and reduction of Fort Pulaski.

Visitor Use and Experience

Visitor understanding of the siege and reduction of the fort and appreciation of the monument's significance would be enhanced by restoring some historic site conditions and views.

Expand recreational access by

- expanding the trail system on Cockspur Island (for example, a trail to the Tybee Knoll Lighthouse oil shed)
- expanding launching facilities for canoes and kayaks at Lazaretto Creek

Access

Same as alternative A with the addition of expanded canoe and kayak launching facilities at Lazaretto Creek.

Boundary Expansion

Same as alternative A.

Interpretation

Same as alternative A with the following additions:

- Interpretation of the siege and reduction of the fort would be improved because vegetation would be removed to better understand the sight lines during the historic battle (from the batteries at Goat Point to Fort Pulaski).
- Expanded recreational opportunities would create additional opportunities for interpreting the natural resources of Fort Pulaski, particularly the tidal salt marshes.

Trails

Same as alternative A with the addition of an expansion of the trail system at the west end of Cockspur Island. A boardwalk would be developed through the marsh on Cockspur Island.

Viewsheds and Vistas

- In accordance with recommendations of the approved cultural landscape report, vegetation would be removed to enhance understanding of the sight lines during the siege and reduction of the fort (from the batteries at Goat Point to Fort Pulaski). This would be the same mitigation strategy as alternative B but less mitigation would be needed.
- This alternative removes less vegetation than alternative B.

PAVED TRAIL

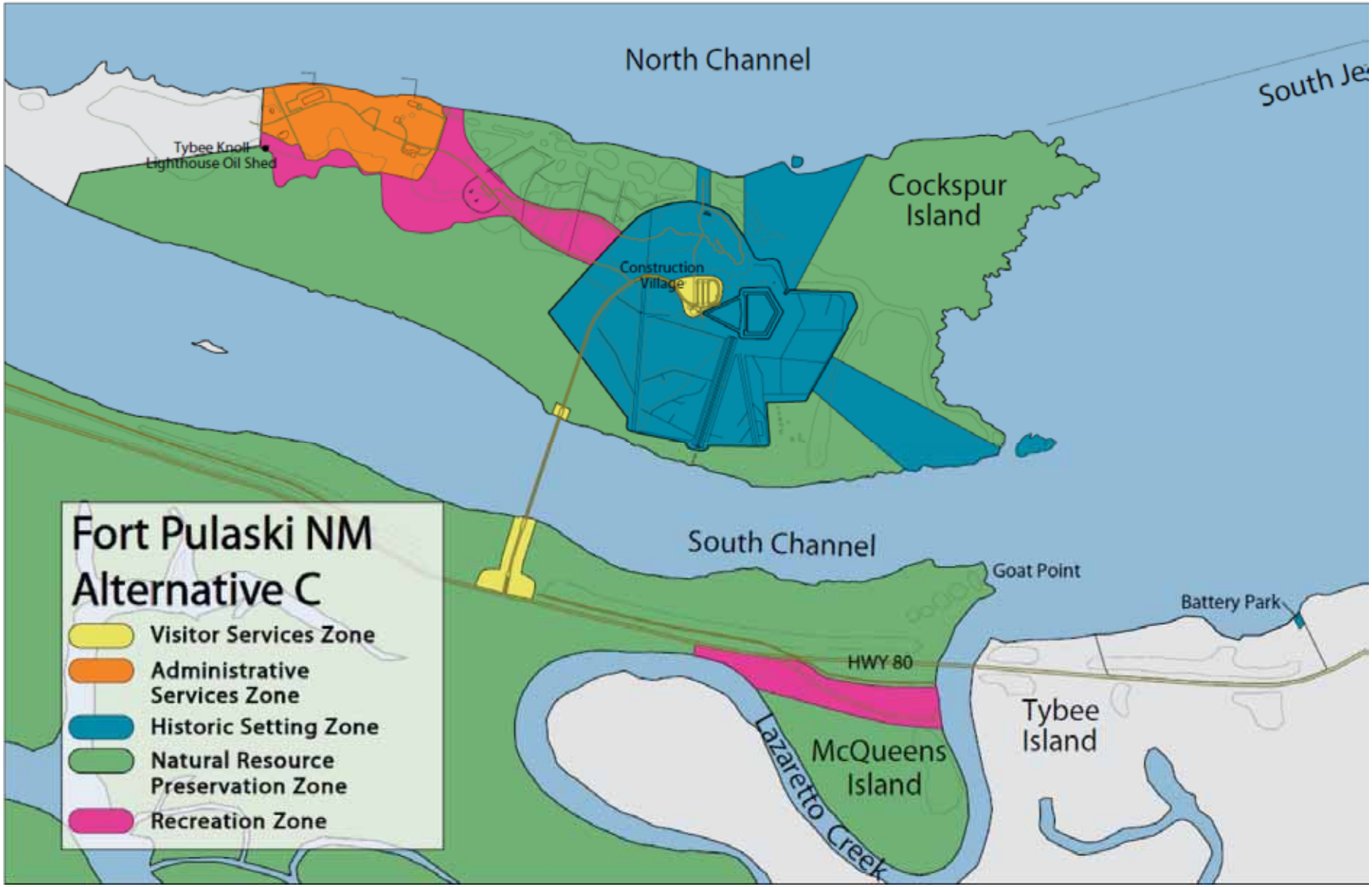


FIGURE 4. ALTERNATIVE C MANAGEMENT ZONES

TABLE 5. COMPARISON OF ALTERNATIVES

	Alternative A	Alternative B	Alternative C	Differences
Overall Concept	Alternative A would continue current management practices and policies.	Fort Pulaski would be managed to focus on the April 1862 period of significance both in terms of the landscape and interpretive programs; this includes landscape restoration and interpretation of the construction village.	Fort Pulaski would be managed with a much broader interpretive mandate than in alternative B to include a wider range of themes and historic periods as well as natural resource themes.	Alternative A would continue current management with no restoration of historic landscapes or views. Alternative B would emphasize restoration of cultural landscapes and viewsheds. Alternative B would also relocate the visitor parking lot to a site outside the view from the top of the fort. Alternative C would place less emphasis on the restoration of historic landscapes and viewsheds and more emphasis on expanding interpretive efforts to include a broader range of historic periods and natural resources themes.
Wilderness	No land within the monument would be proposed for wilderness designation by Congress.	Approximately 4,500 acres of salt marsh at McQueens Island would be proposed for wilderness designation by Congress.	Same as alternative B.	Alternatives B and C are identical with respect to the amount of proposed wilderness under the wilderness study.
Natural Resources	Vegetation would be maintained in its present condition with the exception of removal of dead, diseased, or hazardous trees, and invasive nonnatives and fuel removal in accord with the approved fire management plan. Tidal salt marshes: natural processes would continue except for shoreline erosion control measures and mitigation for U.S. Highway 80 and Savannah Harbor projects. Other wetlands: natural processes would continue; mosquito control would be managed through biological controls. Uplands: mosquito control would be managed through biological controls and grounds maintenance would continue. Wildlife: monument staff would request a deer management	Tidal salt marshes: same as alternative A. Other wetlands: same as alternative A. Uplands: selected vegetation would be removed to facilitate understanding and interpretation of the historic events. Any loss of trees due to vista clearing would be mitigated. Wildlife: same as alternative A. Nonnatives: same as alternative A.	Tidal salt marshes: same as alternative A. Other wetlands: same as alternative A. Uplands: In accordance with recommendations of the cultural landscape report, vegetation would be removed to better understand the sight lines during the historic battle. This alternative removes less vegetation than alternative B. Mitigation measures would be the same as in alternative B. Wildlife: same as alternative A. Nonnatives: same as alternative A.	The larger Historic Setting Zone in alternative B would provide for more restoration of historic views and landscapes than in alternative C. This would mean potentially more vegetative clearing than in alternative C, which would clear vegetation in a narrow, cone-shaped band, from the southeast wall of the fort to the shoreline in the direction of the Battery Park site on Tybee Island. Management of tidal salt marshes, other wetlands, and other natural resources would be identical across all alternatives.

TABLE 5. COMPARISON OF ALTERNATIVES

	Alternative A	Alternative B	Alternative C	Differences
	plan or study. Nonnatives: nonnative plant management would continue with volunteers and staff as resources become available.			
Cultural Resources	Current management of cultural resources would continue. Fort Pulaski's museum collections would be collocated with the collections of Fort Frederica and Ocmulgee national monuments in Macon, Georgia. A fee management program would provide opportunities for deferred maintenance projects, such as re-pointing masonry structures and repairing and maintaining historic structures.	Same as alternative A plus: Larger Historic Setting Zone would permit restoration of some cultural landscapes in accord with an approved cultural landscape report.	Same as alternative B plus: Tybee Knoll Lighthouse oil shed would be stabilized. Access to Cockspur Island Lighthouse would be provided. Smaller Historic Setting Zone in this alternative would permit restoration of cultural landscapes within the historic dike system and some vista clearing between the southeastern wall of the fort and the federal battery exhibit on Tybee Island.	The larger Historic Setting Zone in alternative B would provide for more restoration of historic views and landscapes than in alternative C. Alternative A would maintain existing conditions. Management of historic structures including the fort and demilune, dikes and drainage structures, monuments, World War II era structures, archeological resources, and collections, would be identical under all alternatives.
Visitor Use and Experience	Current programs and opportunities would continue. Visitors would continue to enter the visitor center to obtain basic information and view an orientation film, then walk to the fort and explore on their own. Living history demonstrations and other interpretive programs would continue on a scheduled basis. Access for fishing, walking, biking, and other appropriate activities would remain as currently available.	Same as alternative A plus: Visitor understanding and appreciation of the monument's significance would be enhanced by restoring most historic site conditions and views.	Same as alternative A plus: Visitor understanding of the siege and reduction of the fort and appreciation of the monument's significance would be enhanced by restoring some historic site conditions and views. Recreational access would be increased by expanding the trail system on Cockspur Island and expanding launching facilities for canoes and kayaks at Lazaretto Creek.	Under alternative B the visitor experience would be focused on the views and structural elements of the national monument that tell the story of the siege and reduction and hasty surrender of Fort Pulaski in April 1862. Alternative C would immerse the visitor in a broader range of interpretive themes including natural resource themes.

TABLE 5. COMPARISON OF ALTERNATIVES

	Alternative A	Alternative B	Alternative C	Differences
Access	Current access to the monument via the bridge over the South Channel Savannah River would be maintained. Repairs to correct deteriorating structural conditions are currently in the preliminary design stage.	Same as alternative A.	Same as alternative A plus: Canoe and kayak launching facilities at Lazaretto Creek would be expanded.	All alternatives are the same with respect to maintaining access to Cockspur Island over the existing bridge. Alternative C adds canoe and kayak launching facilities at Lazaretto Creek. Access to the tidal creeks that meander among the salt marshes of McQueens Island would remain the same under all alternatives.
Boundary Expansion	With the U.S. Highway 80 project, the boundary might be expanded to include Bird Island/Long Island as well as the west end of Cockspur Island. Authorizing legislation would be required. Battery Halleck, on Tybee Island, is the only known remaining undisturbed federal battery site. The acquisition of this site would help complete the ability of the national monument to interpret the entire story of the siege and reduction of Fort Pulaski.	Same as alternative A. Same as alternative A.	Same as alternative A. Same as alternative A.	Potential boundary expansion under all alternatives would be identical.
Interpretation	Implementation of the monument's approved long-range interpretive plan would continue.	Same as alternative A plus: Sight lines to the Union batteries would be improved to enable interpreters to more effectively convey aspects of the strategy of the siege and reduction of the fort. Sight lines to the Savannah River would be improved to enable interpreters to more effectively describe the strategic location of the fort and how it defended the Port of Savannah.	Same as alternative A plus: Interpretation of the siege and reduction of the fort would be improved because vegetation would be removed to better understand the sight lines during the historic battle. Recreational opportunities would be expanded to create additional opportunities for interpreting the natural resources of Fort Pulaski, particularly the tidal salt marshes.	Alternative A would continue current interpretive programs, themes, and emphases. Alternative B would focus more on the siege and reduction of Fort Pulaski during April 1862 both in terms of interpretive themes, methods, exhibits, and in managing the cultural landscape and views to support that strategy. Alternative C would expand the range of interpretive themes and historical periods beyond the siege and reduction period and would include more programs, exhibits, and brochures to address natural resource themes, especially the vast salt marshes of McQueens Island.

TABLE 5. COMPARISON OF ALTERNATIVES

	Alternative A	Alternative B	Alternative C	Differences
Trails	The existing trail system would be maintained. With help from partners, the McQueens Island bike trail would be extended from its current end at the entrance to Fort Pulaski across the Lazaretto Creek Bridge to Battery Park on Tybee Island.	Same as alternative A.	Same as alternative A plus: The trail system at the west end of Cockspur Island would be expanded and a boardwalk would be developed through the marsh on Cockspur Island.	All alternatives would expand the McQueens Island bike trail beyond the current end at the Fort Pulaski entrance to Lazaretto Creek and ultimately to Tybee Island.
U.S. Highway 80 Project	The National Park Service would continue to participate in the planning and environmental analysis for this proposed project with the goal of minimizing and mitigating any impacts that would result.	Same as alternative A.	Same as alternative A.	All alternatives are the same.
Savannah Harbor Project	The National Park Service would continue to participate in the planning and environmental analysis for this proposed project with the goal of minimizing and mitigating any impacts that would result, especially impacts on the northern shoreline of Cockspur Island and the impacts on the foundation of the Cockspur Island Lighthouse.	Same as alternative A.	Same as alternative A.	All alternatives are the same.
Viewshed and Vistas	Current viewsheds, none of which are historically accurate, would be maintained.	Selected vegetation would be removed to facilitate understanding of Fort Pulaski's field of fire as a defensive coastal fort and to better understand the sight lines during the historic battle. Any loss of trees due to vista clearing would be mitigated.	In accordance with recommendations of the cultural landscape report, vegetation would be removed to facilitate understanding of the sight lines during the siege and reduction of the fort. The mitigation strategy would be the same as alternative B; less mitigation would be needed because less vegetation would be removed.	Alternative A would maintain current landscapes, viewsheds, and vistas. Alternative B would potentially restore historic landscapes, especially through the relocation of the visitor parking lot to a location outside the view from the top of the fort. Alternative C would reestablish the direct line of sight between the southeastern wall of the fort and the approximate location of some of the federal batteries on Tybee Island.

DEVELOPMENT OF COST ESTIMATES

National Park Service decision makers and the public must consider an overall picture of the complete costs and advantages of various alternatives, including the no-action alternative, to make wise planning and management decisions for the monument. Such consideration can shed light on the cost of the no-action alternative and make possible a more legitimate comparison to the action alternatives.

The actual cost of implementing the approved general management plan will ultimately depend on future funding and servicewide priorities over the life of the plan, as well as the ability to partner with other agencies or groups. The approval of a general management plan does not guarantee that funding and staffing needed to implement the plan will be forthcoming. Funding for capital construction improvements is not currently shown in NPS construction programs. It is not likely that all capital improvements will be totally implemented during the life of the plan. Larger capital improvements may be phased over several years.

Cost estimates were developed through an evaluation of capital and annual operating costs for each of the alternatives. The estimates in this section regarding the general costs of implementing the alternatives were originally developed based on fiscal year 2006 dollars and the *Cost Estimating Guideline with Class "C" Cost Data: New Construction* (NPS 2001). The cost table has been adjusted upward from those numbers by an inflation factor of 9.3% representing the period January 2006 through February 2010. This inflation factor was obtained using a calculator on the website InflationData.com, published by Financial Trend Forecasters®. The National Park Service uses a broad range of costing techniques including Class "A," Class "B," and Class "C" levels of cost estimating. Class "A" and "B" estimates are based on more detailed information, and represent design and construction finances at the time of actual development activities. The capital costs estimates calculated for this general management plan are in the form of Class "C" estimates, which are general order-of-magnitude estimates. The accepted industry range of Class "C" estimates is minus 30 percent to plus 50 percent. Therefore, a $1,000,000 estimate has an actual range of between $700,000 and $1,500,000.

Range of Annual Costs

Annual operating costs are the total costs per year for maintenance and operations associated with each alternative, including utilities, supplies, staff salaries and benefits, leasing, and other materials. Cost and staffing estimates assume that the alternative is fully implemented as described in the narrative.

The total number of full-time equivalent employees is the number of person-years of staff required to maintain the assets of the monument at a good level, provide acceptable visitor services, protect resources, and generally support monument operations. The full-time equivalent number indicates staff funded by the operation of the National Park System only, not volunteer positions or positions funded by partners. Full-time equivalent salaries and benefits are included in the annual operating costs.

One-time facility costs include those for the design, construction, rehabilitation, or adaptive reuse of visitor centers, roads, parking areas, administrative facilities, comfort stations, educational facilities, entrance stations, fire stations, maintenance facilities, museum collection facilities, and other visitor facilities.

One-time nonfacility costs include actions for the preservation of cultural or natural resources not related to facilities, the development of visitor use tools not related to facilities, and other monument management activities that would require substantial funding above monument annual operating costs. Examples include preparing historic structures reports and an historic resource study.

Implementation

Actions directed by general management plans or in subsequent implementation plans are accomplished over time. Budget restrictions, requirements for additional data or regulatory compliance, and competing national park system priorities could prevent immediate implementation of many actions. Major or especially costly actions could be implemented 10 or more years into the future.

TABLE 6. COSTS OF ALTERNATIVES

Item	Alternatives		
	Alternative A	Alternative B	Alternative C
Annual Operating Costs (ONPS) (1)	$1,396,627	$1,517,374	$1,507,143
Staffing—Full-time Equivalent (FTE) (2)	23	23	23
Total One-time Costs	$488,890	$1,468,770	$1,212,978
One-time Facility Costs (3)	$445,389	$683,786	$427,994
Visitor Center Annex	$445,389	$445,389	$445,389
One-time Nonfacility Costs (4)	$43,501	$339,595	$339,595

(1) Annual operating costs are the total costs per year for maintenance and operations associated with each alternative, including utilities, supplies, staff salaries and benefits, leasing, and other materials. Cost and staffing estimates assume that the alternative is fully implemented as described in the narrative.

(2) The total number of FTEs is the number of person-years of staff required to maintain the assets of the monument at a good level, provide acceptable visitor services, protect resources, and generally support monument operations. The FTE number indicates ONPS-funded NPS staff only, not volunteer positions or positions funded by partners. FTE salaries and benefits are included in the annual operating costs.

(3) One-time facility costs include those for the design, construction, rehabilitation, or adaptive reuse of visitor centers, roads, parking areas, administrative facilities, comfort stations, educational facilities, entrance stations, fire stations, maintenance facilities, museum collection facilities, and other visitor facilities.

(4) One-time nonfacility costs include actions for the preservation of cultural or natural resources not related to facilities, the development of visitor use tools not related to facilities, and other monument management activities that would require substantial funding above monument annual operating costs. Examples include preparing historic structures reports and an historic resource study.

The following applies to costs presented throughout this general management plan:

- The costs are presented as estimates and are not appropriate for budgeting purposes.
- The costs presented have been developed using NPS and industry standards to the extent available.
- Specific costs will be determined at a later date, considering the design of facilities, identification of detailed resource protection needs and changing visitor expectations.
- Actual costs to the National Park Service will vary depending on if and when the actions are implemented, and on contributions by partners and volunteers.
- Approval of the general management plan does not guarantee that funding or staffing for proposed actions will be available.
- The implementation of the approved plan, no matter which alternative, will depend on future NPS funding levels and servicewide priorities, and on partnership funds, time, and effort.

TABLE 7. SUMMARY OF IMPACTS

Topic	Alternative A	Alternative B	Alternative C
Transportation	Impacts to transportation under all alternatives would be negligible to minor, long term, direct, and adverse. Moderate to major impacts on a number of monument natural resources could ensue from deepening the Savannah River ship channel and constructing the proposed Jasper Port, both of which would take place outside the monument boundary.	Same as alternative A.	Same as alternative A.
Climate	Direct impacts on climate under all alternatives would be negligible, long term, direct and indirect, and adverse. Major, long-term, and adverse impacts on monument resources could ensue from global climate change. The alternatives in this plan would contribute a negligible increment to this adverse impact.	Same as alternative A.	Same as alternative A.
Archeological Resources	Impacts on archeological resources would continue to result from visitor use and administrative activities. Impacts would be permanent, negligible, and adverse.	Impacts similar to alternative A, except that landscape restoration activities (i.e., removing and replanting trees) could result in some soil disturbance and attendant impacts on archeological resources. Similar impacts may result from relocating the parking area and removing the old lot. On the other hand, funding would also be sought for archeological studies to provide information about the construction village that was necessary to recreate part of the cultural landscape. Funding would also be sought to prepare exhibits. Overall, impacts on archeological resources would be permanent, negligible, and adverse.	Impacts similar to alternative A, except that landscape restoration activities (i.e., removing and replanting trees) could result in some soil disturbance and attendant impacts on archeological resources. Impacts from restoration would be less under this alternative than under alternative B because the amount of land to be restored is smaller and because the parking lot would not be relocated. Impacts on archeological resources would be permanent, negligible, and adverse.
Museum Collections	Moving museum collections to a safer location would result in permanent, beneficial impacts. Cumulative impacts on museum collections would be permanent and beneficial. The actions under alternative A would contribute a significant increment to this cumulative impact.	Impacts similar to alternative A. However, funding would also be sought for archeological studies to provide information about the construction village that was necessary to recreate part of the cultural landscape. In addition, funding would be sought to prepare exhibits. The proposed studies would expand the monument's museum collections. Impacts to museum collections would be local, long term, and beneficial. Cumulative impacts would be	Same as alternative A.

TABLE 7. SUMMARY OF IMPACTS

Topic	Alternative A	Alternative B	Alternative C
		permanent and beneficial. The actions under alternative B would contribute a significant increment to this cumulative beneficial impact.	
Historic Structures	Impacts to historic structures would continue to occur due to aging of the historic fabric, normal wear and tear, and vandalism. Impacts would be short term, negligible, and adverse, mostly due to normal wear and tear. Cumulative impacts would be moderate to major and adverse due to continued development in the local and regional area. The actions under alternative A would constitute a negligible increment to this cumulative impact.	Impacts to historic structures would for the most part be local, long term, direct and indirect, and beneficial due to partial restoration of the historic scene from the principal period of significance. However, removal of the parking area of the Mission 66 visitor center would result in long-term, direct, major, and adverse impacts on a historic structure. In addition, some short-term, direct, negligible, and adverse impacts would occur to historic structures, mostly due to normal wear and tear. Cumulative impacts would be moderate to major and adverse due to continued development in the local and regional area. The actions under alternative B would contribute to these adverse cumulative impacts on a negligible to minor degree.	Same as alternative A, plus impacts from stabilizing the Tybee Knoll Lighthouse oil shed and providing access to Cockspur Island Lighthouse. Impacts to historic structures would for the most part be local, long term, direct and indirect, and beneficial. Some short-term, direct, negligible, and adverse impacts would occur, mostly due to normal wear and tear. Cumulative impacts would be moderate to major and adverse. The beneficial actions under alternative C would offset these cumulative adverse impacts on a negligible degree.
Cultural Landscape	Impacts to the cultural landscape would be long term and beneficial due to a gradual reduction in nonnative vegetation. Cumulative impacts would be long term, minor to moderate, and both beneficial and adverse. Alternative A would contribute a negligible to minor increment to this cumulative impact.	Impacts to the cultural landscape would be long term, moderate to major, and both beneficial and adverse. Restoration of historic site conditions and views would result in an overall beneficial impact on the cultural landscape; however, movement of the visitor center parking lot from its original location would result in an adverse effect to a historic property. Cumulative impacts would be long term and beneficial. Alternative B would contribute a moderate increment to this cumulative impact.	There would be less restoration of cultural landscapes under this alternative than under alternative B. Beneficial impacts of restoring historic site conditions and views would be correspondingly less. Unlike alternative B, there would be no impacts on the cultural landscape (beneficial or adverse) resulting from relocation of the existing visitor center parking lot. Overall impacts on the cultural landscape would be long term and beneficial due to restoration of historic site conditions and views. Cumulative impacts would be long term, minor to moderate, and both beneficial and adverse. Alternative C would contribute a moderate, beneficial increment to this cumulative impact.

TABLE 7. SUMMARY OF IMPACTS

Topic	Alternative A	Alternative B	Alternative C
Ethnographic Resources	Alternative A would have few if any impacts on ethnographic resources at Fort Pulaski because it would continue to provide long-term protection to the fort and its historic context. Impacts to ethnographic resources would therefore probably be negligible, long term, and neutral.	Same as alternative A.	Same as alternative A.
Soils and Geologic Resources	Geological, physiographical, and soil resources would continue be subject to current management practices and policies. Impacts on soils and geologic resources would be long term, negligible to minor, adverse, and local. There would be a long-term, moderate to major, adverse cumulative impact on soils and geologic resources. The actions under alternative A would contribute a negligible increment to this cumulative impact.	Impacts would include those from alternative A, plus impacts from restoration of historic site conditions and views in selected locations. There would be additional impacts from moving the visitor parking lot. Soils under the old parking area would be restored as much as possible in order to recover a semblance of the historic scene. Soils under the new parking area would be compacted and covered by paving material. Overall impacts on soils would be local, long term, direct, minor to moderate, and adverse. There would be a long-term, moderate to major, adverse cumulative impact on soils and geologic resources. The actions under alternative B would contribute a very small increment to this cumulative impact.	Impacts would include those from alternative A, together with additional erosion from construction and use of new trails and other recreational facilities. Some removal of vegetation would occur to restore historic sight lines, but not as much as under alternative B. Impacts to soils would be local, short and long term, minor, and adverse. There would be a long-term, moderate to major, adverse cumulative impact on soils and geologic resources. The actions under alternative C would contribute a negligible increment to this cumulative impact.
Plant Communities and Vegetation	Current impacts on plant communities and vegetation would continue and would be due primarily to removal of dead, diseased, or hazardous trees, as well as fuel removal in accordance with the approved fire management plan. Impacts would be long term, adverse, negligible to minor, and local. There could be long-term, moderate to major, adverse cumulative impacts on vegetation and plant communities in the surrounding region. The actions under alternative A would contribute a negligible increment to this cumulative impact.	Impacts would include those from alternative A, plus impacts from restoration of historic site conditions and views in selected locations including moving the visitor parking lot. Vegetation in the vicinity of the old parking area would be restored as much as possible in order to recover a semblance of the historic scene. Vegetation in the area of the new parking lot would be removed. Overall impacts on plant communities and vegetation would be local, long term, direct, minor to moderate, and adverse. There would be a long-term, moderate to major, adverse cumulative impact on plant communities and vegetation. The actions under alternative B would contribute a small increment to this adverse cumulative impact.	Impacts would include those from alternative A, plus impacts from restoration of historic views and installation of some new recreational facilities. Impacts to plants and plant communities from vista clearing would be less under alternative C than under alternative B because less clearing would take place under alternative C. Impacts on plant communities and vegetation would be local, short and long term, direct, minor, and adverse. There would be long-term, moderate to major, adverse cumulative impacts on vegetation and plant communities in the surrounding region. The actions under alternative C would contribute a very small increment to this cumulative impact.

TABLE 7. SUMMARY OF IMPACTS

Topic	Alternative A	Alternative B	Alternative C
Exotic/Nonnative Plants	Impacts from continuing encroachment of nonnative plants and nonnative vegetation would be long term, adverse, and moderate to major, and would be concentrated on Cockspur Island. There could be a long-term, moderate to major, adverse cumulative impacts on native natural processes. The actions under alternative A would contribute a very small increment to this cumulative impact.	Site restoration activities would produce some reductions in nonnative vegetation, but nonnative vegetation would continue to displace native vegetation in large portions of Cockspur Island. In addition, relocation of the parking lot would result in disturbed ground where nonnatives could generate. Site restoration in the former parking area would entail control of nonnatives. Nevertheless, despite these and other efforts, nonnative vegetation would continue to displace native vegetation in large portions of Cockspur Island. Overall, impacts from nonnative plants and nonnative vegetation would be long term, adverse, and moderate to major. There could be long-term, moderate to major, adverse cumulative impacts on native natural processes. The actions under alternative B would offset these cumulative adverse impacts to a negligible degree.	Impacts would generally be the same as under alternative B, except that a less extensive sightline restoration effort would mean less removal of nonnatives. Impacts from nonnative plants and nonnative vegetation would be long term, adverse, and moderate to major, and would be concentrated on Cockspur Island. There could be long-term, moderate to major, adverse cumulative impacts on native natural processes. The actions under alternative C would offset these cumulative adverse impacts to a negligible degree.
Fish and Wildlife	Existing impacts on fish and wildlife would continue, primarily as a result of disturbance to soils and vegetation caused by ongoing visitor use and NPS management activities. Impacts would be long term, minor, and both beneficial and adverse. Impacts would be concentrated at Cockspur Island. Minor adverse impacts on soil, water quality, and vegetation would result in minor adverse effects on some fish and wildlife species. In contrast, the removal of nonnatives would result in minor beneficial effects on some wildlife species. There would be long-term, moderate, adverse cumulative impacts on fish and wildlife. The actions under alternative A would contribute a very small increment to this cumulative impact.	Impacts on fish and wildlife would be local, short and long term, direct and indirect, minor, and both beneficial and adverse. Impacts would be concentrated at Cockspur Island and would result from restoration of historic site conditions and views in selected locations, as well as movement of the principal parking area to a new location. Minor adverse impacts on soil, water quality, and vegetation would result in minor adverse effects on some fish and wildlife species. In contrast, the removal of nonnatives would result in minor beneficial effects on some wildlife species. There would be long-term, moderate, adverse cumulative impacts on fish and wildlife. The actions under alternative B would contribute a very small increment to this cumulative impact.	Impacts on fish and wildlife would be local, short and long term, direct and indirect, minor, and both beneficial and adverse. Impacts would be concentrated at Cockspur Island and would result primarily from restoration of historic site conditions and views in selected locations, as well as the construction of new recreational facilities. Minor adverse impacts on soil, water quality, and vegetation would result in minor adverse effects on some fish and wildlife species. In contrast, the removal of nonnatives would result in minor beneficial effects on some wildlife species. There would be long-term, moderate, adverse cumulative impacts on fish and wildlife. The actions under alternative C would contribute a very small increment to this cumulative impact.

TABLE 7. SUMMARY OF IMPACTS

Topic	Alternative A	Alternative B	Alternative C
Water Quality	Impacts on water quality would be due to sedimentation from existing roads and trails, as well as from oil and grease discharges at parking areas and road crossings over waterways. Additional impacts could occur from the use of herbicides to control nonnative vegetation. Impacts would be long term, negligible to minor, adverse, and local. There would be a long-term, adverse cumulative impact on water quality in the watershed. The intensity of the impact is unknown. The actions under alternative A would contribute a very small adverse increment to this cumulative impact.	Overall, impacts on water quality under alternative B would be local, short and long term, direct and indirect, minor, and adverse. There would be a long-term, adverse cumulative impact on water quality in the watershed. The intensity of the impact is unknown. The actions under alternative B would contribute a very small increment to this cumulative impact. Impacts would be partially mitigated by use of best management practices during clearing and site recovery.	There would be slightly more runoff and impacts on water quality under alternative C than under alternative A, but less than under alternative B. Impacts on water quality would be local, short and long term, minor, and adverse. There would be a long-term, adverse cumulative impact on water quality in the watershed. The intensity of the impact is unknown. The actions under alternative C would contribute a very small increment to this cumulative impact. Impacts would be partially mitigated by use of best management practices during clearing and site recovery.
Floodplains	Impacts from actions under this alternative would not result in impairment of floodplain functions because no new structures would be built that would impede the flow of floodwaters, and impacts from existing structures would be negligible to minor. Nothing in this alternative would increase the risk posed by flooding to the historic fort or other key monument resources. Cumulative impacts would be long term, minor to major, and adverse. The actions under alternative A would contribute a very small increment to this cumulative impact.	Same as alternative A.	Impacts would generally be the same as under alternatives A and B. Some new trails and other recreational facilities would be constructed, with minimal additional impacts on floodplain functioning. Impacts to floodplain functions would be negligible to minor, local, direct and indirect, and adverse. Impacts to infrastructure in the event of flooding would be moderate to major, short and long term, and adverse. Cumulative impacts would generally be the same as under alternative A. The actions under alternative C would contribute a very small increment to this adverse cumulative impact.
Wetlands	Past impacts on wetlands would continue and would be long term, minor, adverse, and local. There would be a long-term, minor to major, adverse cumulative impact on wetlands. The actions under alternative A would not contribute any new impacts on this cumulative impact.	Impacts would generally be the same as those from alternative A. The site of the new visitor parking area under alternative B is located in an area of former (pre-1847) wetlands. Final siting of the parking area will be done in such a way as to avoid or minimize any wetland impacts. Such impacts, if they occur, are likely to be local, long term, negligible to moderate, and adverse. Cumulative Impacts would be the same as under alternative A. The actions under alternative B would contribute a very small increment to this cumulative impact.	Same as alternative A.

TABLE 7. SUMMARY OF IMPACTS

Topic	Alternative A	Alternative B	Alternative C
Wilderness Resources and Values	Resources would continue to be protected and opportunities for solitude and primitive and unconfined recreation would continue to be available. Impacts on wilderness resources and values from the continuation of current management would be long-term, minor, beneficial, and local. There would be a long-term, minor to moderate, adverse cumulative impact on wilderness resources and values in the region. The actions under alternative A would not contribute to this cumulative impact.	Formal designation of wilderness would afford the highest level of protection available to federally managed public lands and allow permanent protection of the wilderness resource. Impacts on wilderness resources and values would be long term, moderate to major, and beneficial. There would be a long-term, minor to moderate, adverse cumulative impact on wilderness resources and values in the region. The actions under alternative B would offset these impacts somewhat by granting most of the salt marsh in the monument permanent protection as wilderness.	Same as alternative B.
Visitor Use and Experience	Access to historic resources and the availability of varied recreational opportunities would continue. Impacts on visitor use and experience would be long term, moderate, and neutral. The cumulative impact on visitor use and experience in the monument would be long term, negligible to minor, and beneficial. The actions under the no-action alternative would not contribute an appreciable increment to this cumulative impact.	Impacts to visitor use and experience would stem primarily from targeted restoration of historic views, including enhanced historic views west from the fort gun deck resulting from relocation of the visitor parking lot. The area of the former parking area would be restored as much as possible to its historic appearance, thereby enhancing the experience of many visitors. The impacts would be local, short and long term, moderate, and both beneficial and adverse, depending on a given visitor's individual preferences. Some visitors would appreciate the enhanced opportunity to experience historic views, while others would experience the removal of vegetative cover as a loss. The cumulative impact on visitor use and experience in the monument would be long term and beneficial. The actions under alternative B would contribute substantially to this cumulative impact.	Impacts to visitor use and experience under alternative C would stem both from targeted restoration of historic views and authorization of additional recreational facilities. Impacts would be local, short and long term, moderate, and both beneficial and adverse, depending on a given visitor's individual preferences. Less clearing would take place under this alternative than under alternative B, and impacts on visitor use and experience would vary accordingly. The cumulative impact on visitor use and experience in the monument would be long term and beneficial. The actions under alternative C would contribute a substantial increment to this cumulative impact.

TABLE 7. SUMMARY OF IMPACTS

Topic	Alternative A	Alternative B	Alternative C
Socioeconomic Environment	There would be no changes to visitor spending or construction activity within Chatham County under alternative A. Long-term and short-term impacts on the socioeconomic environment would be local, negligible, and neutral. As a result, county employment, housing, and sales would remain constant. In terms of cumulative impacts, long-term and short-term impacts would be local, moderate, and beneficial. Alternative A would contribute a negligible increment to this total cumulative effect.	This alternative would produce only slight increases to visitor spending or monument expenditures within Chatham County. Long-term and short-term impacts on the socioeconomic environment would be local, negligible, and beneficial. As a result, county employment, housing, and sales would not be measurably affected. In terms of cumulative impacts, long-term and short-term impacts would be local, moderate, and beneficial. Alternative B would contribute a negligible increment to this total cumulative effect.	Same as alternative B.
Monument Operations	Operation of existing visitor and administrative facilities in the monument would result in continuing minor, long-term, neutral impacts on NPS operations. The cumulative impacts of the no-action alternative and other reasonably foreseeable future actions required of monument staff would be minor to moderate, long term, and neutral.	Impacts would include those of alternative A, plus the additional costs and effort needed to restore and maintain targeted historic views. The restoration would impose additional maintenance and interpretation responsibilities on monument staff. However, no addition of permanent staff is necessary to implement alternative B. Thus, alternative B would result in minor, long-term, neutral impacts on monument operations.	Same as alternative B.

MITIGATIVE MEASURES COMMON TO ALL ACTION ALTERNATIVES

Congress charged the National Park Service with managing the lands under its stewardship "in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (NPS Organic Act, 16 USC 1). As a result, the National Park Service routinely evaluates and implements mitigation whenever conditions occur that could adversely affect the sustainability of national park system resources.

To ensure that implementation of the action alternatives protects natural and cultural resources and the quality of the visitor experience, a consistent set of mitigative measures would be applied to actions proposed in this plan. The National Park Service would conduct appropriate environmental review (e.g., that required by the National Environmental Policy Act, National Historic Preservation Act, and other relevant legislation) for these future actions. As part of the environmental review, the National Park Service would avoid, reduce, or minimize adverse impacts when practicable. The implementation of a compliance-monitoring program would be considered to stay within the parameters of NEPA and NHPA compliance documents, U.S. Army Corps of Engineers section 404 permits, etc. Compliance with section 106 and 36 CFR 800 will be guided by the 2008 Programmatic Agreement between the National Park Service, the Advisory Council for Historic Preservation, and the National Conference of State Historic Preservation Officers. The compliance-monitoring program would oversee these mitigative measures and would include reporting protocols.

The following mitigative measures and best management practices would be applied to avoid or minimize potential impacts from implementation of the alternatives. These measures would apply to all alternatives.

Management Strategies to Address Climate Change

Climate change has very high potential to adversely affect the future conditions of coastal resources such as Fort Pulaski National Monument. As global and regional climates continue to change, a management approach that enhances the protection and resilience of climate-sensitive resources is becoming increasingly important. The following outlines such a strategy that adapts to our growing understanding of climate change influences and the effectiveness of management to contend with them.

Climate change science is a rapidly advancing field and new information is continually being collected and released, yet the full extent of climate change impacts on resource conditions is unknown. As such, monument managers and policy makers have not determined the most effective response mechanisms for minimizing impacts and adapting to change. Because of this, this proposed management strategy does not provide definitive solutions or directions; rather it provides science-based and scholarship-based management principles to consider when implementing the broader management direction of the national monument.

Strategy

The NPS Climate Change Response Program aims to prepare the agency and its parks for the anticipated management needs that result from climate change. To help parks cope with the uncertainty in future climate conditions, this Climate Change Response Program serves to help park managers determine the extent to which they can and should act to protect the parks' current resources while allowing the parks' ecosystems to adapt to new conditions. Efforts of the NPS Climate Change Response Program focus on the following strategies:

Science

- Conduct scientific research and vulnerability assessments necessary to support NPS adaptation, mitigation, and communication efforts.
- Collaborate with scientific agencies and institutions to meet the specific needs of management as it confronts the challenges of climate change.
- Learn from and apply the best available climate change science.

Mitigation

- Reduce NPS carbon footprint.
- Promote energy efficient practices, such as alternative transportation.
- Enhance carbon sequestration as one of many ecosystem services.
- Integrate mitigation into all business practices, planning, and the NPS culture.

Adaptation

- Develop the adaptive capacity for managing natural and cultural resources and infrastructure under a changing climate.
- Inventory resources at risk and conduct vulnerability assessments.
- Prioritize and implement actions and monitor the results.
- Explore scenarios, associated risks, and possible management options.
- Integrate climate change impacts into facilities management.

Communication

- Provide effective communication about climate change and impacts to the public.
- Train monument staff and managers in the science of climate change and decision tools for coping with change.
- Lead by example.

With the guidance of the above strategies, Fort Pulaski National Monument will use the following management approach to address climate change throughout the implementation of this general management plan. Further elaboration and adaption of these approaches is anticipated as implementation of the general management plan proceeds.

- Identify key natural and cultural resources and processes that are at risk from climate change. Establish baseline conditions for these resources, identify their thresholds, and monitor for change. Increase reliance on adaptive management to minimize risks.
- Restore key ecosystem features and processes and protect cultural resources to increase their resilience to climate change.
- Use best management practices to reduce human-caused stresses (e.g., monument infrastructure and visitor-related disturbances) that hinder the ability of species or ecosystems to withstand climatic events.
- Form partnerships with other resource management entities to maintain regional habitat connectivity and refugia that allow species dependent on national monument resources to better adapt to changing conditions.
- Reduce or mitigate greenhouse gas emissions associated with national monument operations and visitor use, such as alternative transportation options (e.g., shuttles and low-emission vehicles for the monument's fleet) and biofuels and other

renewable energy sources for the visitor center and administrative buildings.

- Use the fragile environments of Fort Pulaski National Monument such as the salt marshes of McQueens Island as an opportunity to educate visitors about the effects of climate change on the resources they are enjoying. Inspire visitors to take action through leadership and education.

- Manage national monument facilities and infrastructure (structures, trails, roads, docks, drainage systems, etc.) in a way that prepares for and adapts to the effects of climate change.

Cultural Resources

The National Park Service would preserve and protect, to the greatest extent possible, resources that reflect the history, events, and people associated with Fort Pulaski National Monument. Specific mitigative measures include the following:

- Continue to develop inventories for and oversee research about archeological, historic, and ethnographic resources to better understand and manage the resources. Conduct any needed archeological or other resource specific surveys and national register evaluations, and identify recommended treatments. Incorporate the results of these efforts into site-specific planning and compliance documents.
- Continue to manage cultural resources and collections following federal regulations and NPS guidelines. Inventory the monument's collection and maintain it in a manner that would meet NPS curatorial standards.
- Subject projects to site-specific planning and compliance procedures. For archeological resources, by locating projects and designing facilities in previously disturbed (which may represent historical developments requiring treatment as cultural resources) or existing developed areas, make efforts to avoid resources and thus adverse impacts through use of *The Secretary of the Interior's Standards for Archeology and Historic Preservation*.
- Use screening and/or sensitive design that would be compatible with historic resources and cultural landscapes and not adjacent to ethnographic resources. If adverse impacts could not be avoided, a consultation process with all interested parties would be employed to determine the appropriate impact mitigation measure(s).
- Conduct archeological site monitoring and routine protection. Conduct data recovery excavations at archeological sites threatened with destruction, where protection or site avoidance during design and construction is infeasible. Strictly adhere to NPS standards and guidelines on the display and care of artifacts. This would include artifacts used in exhibits in the visitor center.
- In addition, for structures and cultural landscapes, mitigative measures include documentation according to standards of the Historic American Buildings Survey / Historic American Engineering Record / Historic American Landscape Survey. The level of this documentation, which includes photography, archeological data recovery, and/or a narrative history, would depend on significance (national, state, or local) and individual attributes (an individually significant structure, individual elements of a cultural landscape, etc.) and be determined in consultation with the Historic Preservation Division, Georgia Department of Natural Resources.

Natural Resources

Nonnative Plant Species. Implement a nonnative plants control program during construction activities. Standard measures could include the following elements: ensure construction-related equipment arrives on-site free of mud or seed-bearing material, certify all seeds and straw material as weed-free, identify areas of noxious weeds preconstruction, treat noxious weeds or noxious weed topsoil before construction (e.g., topsoil segregation, storage, herbicide treatment), and revegetate with appropriate native species.

Soundscape. Cockspur Island, the site of the principal cultural resource of the national monument, is between U.S. Highway 80 to the south and the Savannah River, the major waterway for large container ships serving the Port of Savannah, to the north. Despite these land and water thoroughfares, the relative quiet and serenity of Cockspur Island is an important feature of the site to visitors.

The National Park Service will restore to the natural condition wherever possible those monument soundscapes that have become degraded by unnatural sounds (noise) and will protect natural soundscapes from unacceptable impacts. Using appropriate management planning, superintendents will identify what levels and types of unnatural sound constitute acceptable impacts on monument natural soundscapes. The frequencies, magnitudes, and durations of acceptable levels of unnatural sound will vary throughout a park, being generally greater in developed areas. Within and adjacent to parks, the National Park Service will monitor human activities that generate noise that adversely affects monument soundscapes, including noise caused by mechanical or electronic devices. The National Park Service will take action to prevent or minimize all noise that through frequency, magnitude, or duration adversely affects the natural soundscape or other monument resources or values, or that exceeds levels that have been identified through monitoring as being acceptable to or appropriate for visitor uses at the sites being monitored.

Soils. Build new facilities on soils suitable for development. Minimize soil erosion by limiting the time that soil is left exposed and by applying erosion control measures, such as erosion matting, silt fencing, and sedimentation basins in construction areas to reduce erosion, surface scouring, and discharge to water bodies. Once work is completed, revegetate construction areas with native plants in a timely manner. Place construction equipment in previously disturbed areas. Locate trails on soils with low erosion hazards and small changes in slope and develop proper signs to minimize social trails. Ensure proper drainage of parking areas.

Threatened and Endangered Species and Species of Concern. Mitigative actions would occur during normal monument operations as well as before, during, and after construction to minimize immediate and long-term impacts on rare, threatened, and endangered species. These actions would vary by specific project and area of the national monument affected, and additional mitigations will be added depending on the specific action and location. Mitigative actions specific to rare, threatened, and endangered species would include the following:

- Conduct surveys for rare, threatened, and endangered species as warranted.
- Locate and design facilities/actions to avoid adverse effects on rare, threatened, and endangered species. If avoidance is infeasible, minimize and compensate for adverse effects on rare, threatened, and endangered species as appropriate and in consultation with the appropriate resource agencies. Conduct work outside of critical periods for the specific species.
- Develop and implement restoration and/or monitoring plans as warranted. Plans should include methods for implementation,

performance standards, monitoring criteria, and adaptive management techniques.

- Implement measures to reduce adverse effects of nonnative plants and wildlife on rare, threatened, and endangered species.

Many of these measures would also benefit rare, threatened, and endangered species by helping to preserve habitat.

Vegetation. Monitor areas used by visitors (e.g., trails) for signs of native vegetation disturbance. Use public education, revegetation of disturbed areas with native plants, erosion control measures, and barriers to control potential impacts on plants from trail erosion or social trailing. Use barriers and closures when necessary to prevent trampling and loss of riparian vegetation. Develop revegetation plans for areas disturbed by construction or unauthorized visitor use and require the use of native species. Revegetation plans should specify seed/plant source, seed/plant mixes, soil preparation, etc. Salvage vegetation from construction activities should be used to the extent possible.

Water Resources. Contractors for construction projects would be required to develop and implement a storm water pollution prevention plan. Standard best management practices to limit erosion and control sediment release would be employed. Such measures include use of silt fencing, limiting the area of vegetative disturbance, use of erosion mats, and covering banked soils to protect them until they are reused. To avoid introduction of nonnative plant species, no hay bales would be used to control soil erosion.

Wildlife. The National Park Service will adopt monument resource preservation, development, and use management strategies that are intended to maintain the natural population fluctuations and processes that influence the dynamics of individual plant and animal populations, groups of plant and animal populations, and migratory animal populations in parks.

In addition to maintaining all native plant and animal species and their habitats inside parks, the National Park Service will work with other land managers to encourage the conservation of the populations and habitats of these species outside parks whenever possible. To meet its commitments for maintaining native species in the national monument, the National Park Service will cooperate with states, tribal governments, the U.S. Fish and Wildlife Service, and the National Oceanic and Atmospheric Administration, as appropriate, to

- participate in local and regional scientific and planning efforts, identify ranges of populations of native plants and animals, and develop cooperative strategies for maintaining or restoring these populations in the parks
- employ techniques to reduce impacts on wildlife, including visitor education programs, restrictions on visitor activities, and park ranger patrols
- prevent the introduction of nonnative species into the national monument
- remove, when possible, or otherwise contain individuals or populations of species that have already become established in the unit

Endangered and Threatened Species. Prior to the implementation of any action that is part of the final approved general management plan, the National Park Service will initiate and complete the appropriate level of compliance with the National Environmental Policy Act, section 7 of the Endangered Species Act (including consultation with the U.S. Fish and Wildlife Service), and the National Historic Preservation Act (especially sections 106 and 110).

Wetlands. Delineate wetlands and apply protection measures during construction. Wetlands would be delineated by qualified

NPS staff or certified wetland specialists and clearly marked before construction work. Construction activities would be performed in a cautious manner to prevent damage caused by equipment, erosion, siltation, etc.

Visitor Safety and Experience

Although there are limitations on its capability to totally eliminate all hazards, Fort Pulaski staff and concessioners, contractors, and cooperators will seek to provide a safe and healthful environment for visitors and employees. The monument staff will work cooperatively with other federal, tribal, state, and local agencies; organizations; and individuals to carry out this responsibility. Fort Pulaski National Monument staff will strive to identify and prevent injuries from recognizable threats to the safety and health of persons and to the protection of property by applying nationally accepted codes, standards, engineering principles, and the guidance contained in Director's Orders 50B: *Occupational Safety and Health Program*, 52C: *Park Signs*, 58: *Structural Fire Management*, and 83: *Public Health* and their associated reference manuals.

The national monument management recognizes that the natural and cultural resources it protects are not only visitor attractions, but that some may also be potentially hazardous. Therefore, when practicable and consistent with congressionally designated purposes and mandates, Fort Pulaski staff will reduce or remove known hazards and apply other appropriate measures, including closures, guarding, signing, or other forms of education. In doing so, the preferred actions will be those that have the least impact on monument resources and values.

Noise Abatement

Mitigative measures would be applied to protect the natural sounds in the national monument. Specific mitigative measures include the following:

- Implement standard noise abatement measures during typical maintenance (grass cutting and use of other types of power equipment) and construction activities. Standard noise abatement measures could include the following elements:
  - a schedule that minimizes impacts to visitor experiences
  - the use of the best available noise control techniques wherever feasible
  - the location of stationary noise sources as far from sensitive uses as possible

Scenic Resources

Mitigative measures are designed to minimize visual intrusions. These include the following:

- Where appropriate, use facilities such as fences to route people away from sensitive natural and cultural resources, while still permitting access to important viewpoints.
- Provide vegetative screening, where appropriate.

FUTURE STUDIES AND IMPLEMENTATION PLANS NEEDED

After completion and approval of a general management plan for managing the national monument, other more detailed studies and plans would be needed for implementation of specific actions. As required, additional environmental compliance (National Environmental Policy Act, National Historic Preservation Act, and other relevant laws and policies), and public involvement, would be conducted. Those additional studies include but would not be limited to the following:

- **Cultural landscape report.** A cultural landscape report is the primary guide to treatment and use of a cultural landscape. Based on the historic context provided in a historic

resource study, a cultural landscape report documents the characteristics, features, materials, and qualities that make a landscape eligible for the national register.

- **Comprehensive interpretive plan.** The comprehensive interpretive plan process is the basic planning component for interpretation and education in a park. The plan is a tool to help parks decide priorities for their objectives, determine what stories to tell, identify their audiences, and describe the most effective mix of media and personal services to use.
- **Resource stewardship strategy.** As a program planning document, the resource stewardship strategy serves as a link between the monument's general management plan and its strategic planning, wherein monument personnel and financial resources are allocated to implement resource stewardship actions. The resource stewardship strategy identifies specific components of the monument resources to target for management during the next 20 years, establishes methods to evaluate the status of these components, determines measurable targets for resources, and evaluates whether the resources are currently meeting targets. Resource stewardship strategy documents are reviewed by subject matter experts before finalization; however, they are not publicly reviewed compliance documents.
- **Climate change scenario planning.** This is a process that informs the park management of the plausible climate futures projected for the region and associated impacts, based on the latest climate models. Managers can then test management strategies/actions under the range of plausible climate futures to help validate future park investments, which includes identifying "no regrets" actions or "no gainer" actions.
- **Vulnerability assessments.** Conduct vulnerability assessments of park natural and cultural resources to sea level rise and increased storm frequency and intensity. Storms are the primary drivers of change along the coast. The National Park Service, in cooperation with various universities and government agencies, is undertaking a series of investigations to assess the vulnerability of natural and cultural resources to storms and sea level rise in coastal parks. These projects will allow managers to better understand the level of vulnerability, improve the park's pre-storm preparedness and post-storm response, and increase the safety of park visitors and employees.
- **Data collection and research.** Initiate data collection and research projects that address climate change effects on the park's natural and cultural resources, as well as on visitors' experiences, health, safety, and overall enjoyment of Fort Pulaski National Monument. These efforts could include scenario planning via the assistance of the NPS Climate Change Response Program and partnership research efforts with other agencies/institutions.
- **Ethnographic overview and assessment.** The most comprehensive background study, this document reviews existing information on monument resources traditionally valued by stakeholders. This study also documents the need for further research on cultural affiliations, important events and associated places in the park, and traditional uses and ways of life.
- **Additional research.** Additional research is needed on the history of Fort Pulaski and Cockspur Island beyond the Civil War to expand understanding of park resources and add to interpretive programs and

media. Research topics in need of further study include American Indian habitation, the construction of Fort Pulaski (including the role of enslaved people) and the fort's role in the Underground Railroad.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The environmentally preferable alternative is defined as the alternative that would promote the national environmental policy as expressed in section 101 of the National Environmental Policy Act. That section indicates that it is the continuing responsibility of the federal government to do the following:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
- Ensure safe, healthful, productive, and esthetically and culturally pleasing surroundings for all Americans.
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
- Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and a variety of individual choices.
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

A description of how each alternative would or would not achieve the requirements of sections 101 and 102(1) of the NEPA criteria is provided below and illustrated through a rating system in table 8.

Criterion 1. Fort Pulaski National Monument is a unit of the national park system and as the trustee of this area the National Park Service would continue to fulfill its obligation to protect this area for future generations. The no-action alternative would provide less direction on important issues needed to successfully manage the monument; consequently it was ranked lower than the action alternatives. Alternatives B and C would provide a roughly equal level of protection for the monument over time. landscape to its historic condition than would the other alternatives. These restoration activities would also provide the greatest protection and enhancement of the monument's cultural landscape.

Criterion 2. All the alternatives would ensure safe, healthful, productive, and culturally pleasing surroundings for all Americans. Alternative B would provide the most pleasing surroundings by moving the existing parking area to a less visible location.

Criterion 3. Alternative C would provide more opportunities for recreational use of monument resources than the other action alternatives, while still ensuring their future protection. Therefore, alternative C scores the highest under criteria 3.

Criterion 4. Alternative B provides the greatest opportunities for learning because it would restore more of the monument's

Criterion 5. All of the alternatives offer environmental protection benefits to society, but alternatives B and C would do so to a greater extent than alternative A.

Criterion 6. All of the alternatives would result in enhancing the quality of the renewable resources through NPS management, but alternatives B and C would do so to a greater extent than alternative A.

The environmentally preferable alternative for the monument's general management plan is alternative B (the preferred alternative). According to the ratings included in table 8, this alternative would surpass the other alternatives in realizing the full range of national environmental policy goals in section 101. In particular, the preferred alternative best responds to criteria 2 ("ensure . . . aesthetically and culturally pleasing surroundings for all Americans") by moving the existing parking area to a less visible location and improving the views from the historic fort.

TABLE 8. ENVIRONMENTALLY PREFERABLE ALTERNATIVE ANALYSIS

Criteria	Alternatives		
	A	B	C
1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.	4	5	5
2. Ensure safe, healthful, productive, and aesthetically and culturally pleasing surroundings for all Americans.	3	5	4
3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.	4	4	5
4. Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and a variety of individual choices.	3	5	4
5. Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.	4	5	5
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.	4	5	5
Total Points*	22	29	28

* Five points were given to the alternative if it fully meets the criterion; four points if it meets nearly all of the elements of the criterion; three points if it meets more than one element of the criterion; two points if it meets only one element of the criterion; and one point if the alternative does not meet the criterion.

ALTERNATIVES AND ACTIONS CONSIDERED BUT DISMISSED FROM DETAILED EVALUATION

During the planning process for Fort Pulaski National Monument, other alternative concepts and elements of concepts were presented and then dismissed from further consideration.

Combination of Two Alternatives

The planning team initially proposed two alternatives whose only difference was that in one, the visitor parking lot would be removed from its current location and relocated to a location outside the view from the top of the fort. The resulting area would be restored partially to the conditions that existed during April 1862 in order to establish a more accurate representation of that scene. During the internal reviews of the *Draft General Management Plan / Wilderness Study / Environmental Impact Statement* the decision was made to combine these two alternatives into one because of their similarity. The resulting alternative is alternative B in the document.

Remove Fort Pulaski and Surrounding Structures from Floodplains

Fort Pulaski National Monument is located within a 100-year floodplain, Zone VE, which has been mapped by the Federal Emergency Management Agency on a flood insurance rate map issued in 2004. Zone VE is described as having a 1% chance of flooding per year with an additional high wind velocity potential (FEMA 2004). No new structures were proposed to be constructed in the 100-year floodplain under either of the action alternatives in the draft plan. However, the National Park Service proposes to retain in place all existing structures in the floodplain because it is not practicable to relocate them to a point outside the 100-year floodplain. In accordance with NPS policy, a floodplain statement of findings has been prepared that outlines in more detail the reasons for retaining these structures in place (see NPS *Management Policies2006*, section 4.6.4). The floodplain statement of findings is attached to this document as appendix D.

Construct an Observation Tower on Tybee Island

The planning team considered construction of an observation tower on Tybee Island as an alternative to clearing a small section of trees on Cockspur Island to provide a view of the fort from Tybee Island that would give visitors to the exhibits at Battery Park some idea of the scene that federal troops manning the batteries on Tybee Island would have had in April 1862. This idea was dismissed as too controversial, costly, impractical, and potentially dangerous.

Permit After-hours Vehicular Access to the Monument

Early consideration was given to providing more after-hours access to the monument for bird watching, fishing, stargazing, nature study, etc. Fishing is now allowed along the banks of the Savannah River on and around Cockspur Island, including the use of the Cockspur Island Bridge after hours (the bridge is closed to vehicles). However, the team determined that to allow vehicles onto the island after hours would put both visitors and resources at risk due to lack of staff available on-site to respond to emergencies.

SOUTH CHANNEL BRIDGE

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AFFECTED ENVIRONMENT

CHAPTER 3: AFFECTED ENVIRONMENT

INTRODUCTION

This chapter describes the existing environment of Fort Pulaski National Monument and the surrounding region. It focuses on the cultural and natural resources of the monument, visitor activities and experiences, facilities, and socioeconomic characteristics that have the potential to be affected if any of the alternatives were implemented.

EARLY HISTORY

Little archeological evidence provides insight into the early history of Cockspur Island, the site of Fort Pulaski National Monument. Nearby islands had American Indian residents during the Middle Woodland (500 BC to AD 500) and Late Woodland (AD 500 to 1100) periods. Not until the 1580s, when Spanish missions began to appear along the Georgia coast, does more specific documented history of Cockspur Island begin (Meader and Binkley 2003).

By 1680, the Spanish had been pushed deeper into present-day Florida through raids by American Indians allied with English settlers to the north. This left the Georgia coast open to English colonization, which occurred with General James Oglethorpe's landing in 1733. Originally called Peeper Island, Oglethorpe's small fleet anchored on Cockspur Island before sailing to the future site of Savannah, Georgia, a set of bluffs overlooking the Savannah River 15 miles west (Meader and Binkley 2003).

With the founding of Savannah, Cockspur Island was used by rum runners, shipping merchants, and blessed by John Wesley in 1736. By 1761, construction of a timber fort had begun on Cockspur Island to protect Savannah from Spanish attacks out of St. Augustine, Florida, to the south. Fort George was built to guard against the Spanish, but became more useful for regulating shipping and pirates and for quarantining the infectious arrivals at the Port of Savannah. Fort George consisted of a 100-foot square palisade enclosing a 40-foot square blockhouse. The structure was in disrepair by the 1770s (Meader and Binkley 2003).

The United States, as a new nation by 1794, authorized the construction of the "First American System of Fortifications." As part of this program, construction began on Cockspur Island at an undocumented site to build a new defensive fort, named Fort Green. Fort Green was constructed of earth and timber and was used primarily as a quarantine station. Fort Green was demolished in a storm in 1804, killing half the inhabitants (Meader and Binkley 2003).

19TH CENTURY HISTORY

Congress authorized the "Second American System of Fortifications" in 1807 and with the guidance of the U.S. Army Corps of Engineers began to design a new, stronger system of fortifications. The War of 1812 provided an impetus to redesign the defense system further. The Third System of U.S. coastal defense was planned to provide greater coastal defense and use modern defensive technology. The defense plans would span four decades and erect masonry forts to defend strategic coastal locations throughout the United States. Cockspur Island was selected as the site for Fort Pulaski in 1828 (Meader and Binkley 2003).

Construction of the red brick walls of Fort Pulaski officially began in 1833, but the years 1829–1831 were notable for young Robert E. Lee's assignment to Cockspur Island as an assistant engineer to Major Samuel Babcock. Lee performed excavation and foundation direction for 3 years before being transferred to Virginia (Meader and Binkley 2003).
The construction phase of Fort Pulaski is marked by the creation of additional

structures on Cockspur Island including the construction village on the north end of the island and a system of dikes and trenches to control the water over the low-lying island. A moat with a drawbridge and other strategic earthworks were also constructed around Fort Pulaski (Meader and Binkley 2003).

The masonry fort used 25 million bricks. It was built with 32-foot-high walls, interior rooms, a large gun deck, and a demilune complete with a drawbridge over the moat. By 1847, Fort Pulaski was essentially completed (Meader and Binkley 2003).

In 1848, the Cockspur Island Lighthouse was built on the southeast corner of the island on a strip of oyster shells and mud. The lighthouse was destroyed by a hurricane in 1854 and a replacement lighthouse was built on the same foundation (Meader and Binkley 2003). This lighthouse still stands in 2013.

Soon after South Carolina's secession from the Union in late 1860, Georgia Governor Joseph Brown garrisoned Fort Pulaski with the Georgia Volunteer Militia. Robert E. Lee returned to Fort Pulaski in November of 1861 to oversee the strengthening of Confederate coastal defenses in Georgia, South Carolina, and Florida. Upon Lee's return to Fort Pulaski, defensive improvements were made and arms were brought from Tybee Island in preparation for war. Federal troops took possession of nearby Tybee Island in response (Meader and Binkley 2003).

On April 10, 1862, Fort Pulaski was bombarded by Union batteries on Tybee Island. The bombardment lasted only 30 hours and brought about the surrender of Fort Pulaski to Union General Quincy Adams Gillmore. Gillmore's rifled cannons breached Fort Pulaski's southeast corner, and subsequently made the use of masonry forts obsolete as defense to modern weaponry (Meader and Binkley 2003).

BREECH IN FORT PULASKI WALL APRIL 1862

Under federal occupation Fort Pulaski was used as a prison camp and blockade station for the Savannah River. Another result of the federal occupation of Fort Pulaski was an influx of escaped slaves to the island seeking federal protection. Many of these former slaves became soldiers in the 1st, 2nd, and 3rd South Carolina Volunteers (Meader and Binkley 2003).

POST-CIVIL WAR HISTORY

After the Civil War, Fort Pulaski continued to serve as a prison for former Confederate officials and Union deserters. The fort's damaged sections were repaired and upgrades to the demilune included earthwork mounds over gun emplacements and underground passageways. Despite the repairs, Fort Pulaski was almost deserted and placed on reserve in 1873 as attention was put toward the construction of Fort Screven on Tybee Island. An army caretaker was left to oversee Fort Pulaski until 1914 (Meader and Binkley 2003).

By the turn of the 20th century, the North Channel Savannah River had become the primary shipping channel due to dredging and Fort Pulaski had been supplanted by Fort Screven on Tybee Island. Fort Pulaski was used as a control station for mining the North Channel Savannah River in 1895 at the outbreak of war in Cuba. Battery Horace Hambright was later built in 1898–1899 on the north shoreline of Cockspur Island for harbor protection during the Spanish-American War. Neither the mines nor the battery saw any military action (Meader and Binkley 2003).

The Cockspur Island Lighthouse continued to operate, but most of the other structures on the island, including the construction village, were destroyed in a hurricane in 1881. The dike system was damaged as well during this storm prompting the construction of a lighthouse keeper's cottage on the upper level, gorge terreplein, in 1906. A jetty was constructed on the northeast end of Cockspur Island attracting sediment and building up the island on the northeast side. In 1889, a wood frame elevated quarantine station was built on the northwest portion of Cockspur Island. This station continued to expand in buildings and acreage until after World War I when it was closed and the quarantine station moved to Savannah (Meader and Binkley 2003). The quarantine station attendant's cottage was eventually adapted for a monument residence and in 1999 was converted into the monument's administrative headquarters.

In 1933, the National Park Service acquired Fort Pulaski National Monument from the War Department, but years of prior neglect ensured that years of further effort were required to rehabilitate the fort and its grounds. The first steps in this process centered on monument development. Fortunately, several New Deal agencies, especially the Civil Works Administration, the Civilian Conservation Corps, and the Public Works Administration, were able to help Fort Pulaski achieve many of its early development goals (Meader and Binkley 2003).

In May 1934, the Department of the Treasury authorized the National Park Service to establish CCC Camp 460 on the northwest shore of Cockspur Island directly east of the old U.S. Public Health Service quarantine station. This location proved to be ideal because of its access to a first-class ship's dock and short 15-minute walk to the fort. Extra buildings at the quarantine station, built at the end of World War I, provided quarters for enrollees (Meader and Binkley 2003).

In late 1941, the U.S. Navy established a section base on Cockspur Island for use by small coastal patrol ships. The Navy's occupation of Fort Pulaski National Monument lasted the duration of World War II and ended in 1947. Moreover, when the Navy finally vacated Cockspur Island, it left behind many ramshackle buildings that NPS planners had to consider. By 1949, the National Park Service had drafted a plan that proposed to remove 57 buildings, many of them from the Navy occupation. However, to redevelop the residence and utility area as specified in the 1942 master plan, 8 buildings were to be retained and used for monument purposes: 3 residences, the fire pump house and firehouse, a transformer house, a small magazine, and a lumber shed.

Historic American Building Survey

World War II Bunker Fort Pulaski

Official interaction between the U.S. Coast Guard and Fort Pulaski National Monument began in 1938 when the former obtained NPS permission to establish a wharf on Lazaretto Creek within the monument's boundary. The wharf is between McQueens Island and

Tybee Island, near the creek's confluence with the South Channel Savannah River. The next major activity of the U.S. Coast Guard on Cockspur Island began on June 20, 1945, when the U.S. Navy transferred its Naval Receiving Station to the agency. The end of World War II created a sudden demand for the U.S. Coast Guard to obtain facilities to discharge demobilized personnel. The discharge center operated only until June 17, 1946, at which time the U.S. Coast Guard vacated its Navy buildings (Meader and Binkley 2003).

Although the U.S. Coast Guard discharge center closed and the Navy returned Fort Pulaski to the National Park Service in 1948, the U.S. Coast Guard sought to continue activities at the monument. In 1949, Superintendent Ralston Lattimore agreed to allow the U.S. Coast Guard to use the wharf built by the Navy on the north shore of Cockspur Island. The following year, the National Park Service issued a permit to the U.S. Coast Guard to use and maintain 350 feet of the deep-water dock, followed by a long-term special use permit on September 25, 1952. By January 1954, the U.S. Coast Guard further proposed to claim a large section of Cockspur Island's residence and utility area to establish barracks and recreational facilities. The proposal lacked a strong defense purpose, however, and the National Park Service was thus successful in rejecting the application. A few years later, the U.S. Coast Guard renewed its attempt to expand operations on Cockspur Island. On November 17, 1965, the agency succeeded in establishing a search and rescue station. The National Park Service issued a special long-term use permit that allowed the U.S. Coast Guard to occupy a 400-foot by 450-foot tract of land on which permanent buildings, concrete-moorings, and communication equipment and antennas were constructed.

In 1980, an interagency agreement between the National Park Service and the U.S. Coast Guard authorized administrative jurisdiction over an additional 1.85 acres of land for the search and rescue station as long as it did not jeopardize or interfere with the area's natural and historic resources. In 1993, the U.S. Coast Guard reconstructed a 75-foot-tall steel aid-to-navigation structure destroyed in a recent storm and originally built in 1978. The U.S. Coast Guard continues these operations at Fort Pulaski National Monument to this day. Generally, the National Park Service views U.S. Coast Guard activities as compatible with monument policy (Meader and Binkley 2003).

The Savannah bar pilots and their collective, the Savannah Pilots Association, have roots that trace to the early days of the Colony of Georgia. Reportedly, William Lyford established a pilot house near Fort George on Cockspur Island in 1768. The State Board of Commissioners of Pilotage at the Port of Savannah currently regulates the bar pilots, who earn their keep by facilitating safe passage to and from the port through the difficult-to-navigate waters of the Savannah River. Individual ships or shipping companies pay the pilots for these services. Cockspur Island provides a convenient location for the Savannah Pilots Association dock and facilities because every commercial vessel entering or leaving the Savannah River must have a pilot on board (Meader and Binkley 2003).

In 1940, the Savannah Pilots Association moved their operations from Lazaretto Creek to the west end of Cockspur Island. At first, the group requested the use of quarters and the dock on the north channel of the island, but the NPS coordinating superintendent opposed their presence. He felt that they had no historical association with the monument. Superintendent Holland disagreed due to the relevance of the operation of the Savannah Harbor. The NPS acting director concurred with Holland and approved the proposal in October 1940. This decision was taken in light of the public service that would benefit the monument during weather emergencies and because it would receive immediate notice of advancing storms. Annual rent for the Savannah Pilots Association was set at $70 (Meader and Binkley 2003).

The Savannah Pilots Association soon moved into a dormitory and two small buildings and occupied this facility under a special use permit that was renewed annually. This arrangement worked until the early 1970s, by which time the bar pilots' buildings had deteriorated. In 1973, the National Park Service issued a 20-year special use permit to the Savannah Pilots Association to construct, maintain, and use living quarters, a dock, and fuel supply system, and a parking area on its .67-acre lot. With a long-term lease in place, the bar pilots completed renovations. The new dormitory they built stands at the location of the previous Savannah Pilots Association building. The National Park Service renewed the association's special use permit in 1993 and again in 1998 (Meader and Binkley 2003).

The Savannah bar pilots have had exclusive use of NPS land and improvements at Fort Pulaski National Monument since 1940 to operate a vessel piloting business. The National Park Service authorized the use by special use permit in 1940 and has issued, through Fort Pulaski, a series of permit renewals since that time. The last permit renewal expired on December 8, 2008. Based on research and a recent Office of Inspector General report, the legality of continuing to authorize the use by special use permit was then subject to question. The Savannah Pilots Association wished to continue operating their business out of Fort Pulaski. There were not at that time, and are not now, any other known locations that would allow the Savannah bar pilots to operate more efficiently because of the deep water accessibility and the distance to embarking and disembarking ships that enter and leave the Savannah Harbor. The bar pilots have been operating at the current location for more than 70 years with virtually no adverse impact on monument resources, visitor experience, or monument operations. On December 19, 2011, President Barack Obama approved Public Law 112-69 which authorizes the Secretary of the Interior to lease no more than 30,000 square feet of land and improvements at the location on Cockspur Island that has been used continuously by the Savannah Pilots Association since 1940.

THE NATIONAL MONUMENT AND ITS REGIONAL CONTEXT

Fort Pulaski National Monument encompasses large portions of Cockspur and McQueens islands in Chatham County, Georgia, approximately 13 miles east of Savannah. Cockspur Island sits at the mouth of the Savannah River, splitting the river into north and south channels that enter the Atlantic Ocean at the island's eastern end. The city of Tybee Island and its popular beaches are about 5 miles east via U.S. Highway 80.

Tybee Island, the location of federal batteries during the Battle of Fort Pulaski, is southeast of Cockspur Island across the South Channel Savannah River. McQueens Island, 5,000 acres of salt marsh and part of Fort Pulaski National Monument, is south of Cockspur Island and connected by the South Channel Bridge. Lazaretto Creek separates McQueens Island from Tybee Island to the east.

Fort Pulaski National Monument is regionally located adjacent to a state line, the North Channel Savannah River, politically separating Georgia and South Carolina near the mouth of the Savannah River on the Atlantic Coast. This location is easily accessible by Interstate 95 connecting Florida to Maine along the Atlantic Seaboard. Interstate 16 runs east-west and connects Savannah, Georgia, to Interstate 75 and Atlanta, Georgia, where major air, freight, and other interstate highways converge. Fort Pulaski National Monument is a day's drive from central Florida, Alabama, Georgia, South Carolina, North Carolina, and parts of Virginia. Population centers in this region include Savannah, Macon, Atlanta, and Augusta in Georgia; Jacksonville, Orlando, Tampa, and Miami in Florida; Birmingham and Montgomery in Alabama; Charleston, Columbia, and Greenville in South Carolina; and Charlotte, Raleigh-Durham, Wilmington,

Winston-Salem, and Greensboro in North Carolina.

Fort Pulaski is sited at the eastern end of Cockspur Island and faces due east. The fort's footprint encompasses 3.25 acres, surrounded on three sides by the broad waters of the Savannah River. The historic 2-mile system of dikes and ditches encircles the fort and demilune. The boundaries of Fort Pulaski National Monument encompass 5,623 acres of Cockspur Island and the majority of McQueens Island across the South Channel Savannah River.

Cockspur Island is a low, marshy island. Much of it was formerly salt marsh, but centuries of draining, dredging, and filling have created dry land. Still, elevations seldom reach more than 6 or 7 feet above sea level and about half the island is inundated at high tide. Most of the high ground is located within the historic 2-mile dike system and in the area to the west of the fort and north of the service road, extending as far as the World War II bunkers. Much of the area south of the service road has never been filled and stays wet most of the time. There is a retention pond in this area.

Long Island, to the immediate west of Cockspur Island, has had a similar history of draining, dredging, and filling. Over the years, the two islands had become joined through this process. Late in 2007, a breach opened this connector between Cockspur and Long islands and has since widened, recreating two separate islands.

The Cockspur Island Lighthouse was built in 1854 and sits on an islet at the mouth of the South Channel Savannah River. The use of the lighthouse as a shoreline navigational guide was discontinued in 1949 with increased use of the North Channel Savannah River for shipping. It was transferred to National Park Service ownership from the U.S. Coast Guard in 1959. Periodic attempts to organize a reconstruction effort after NPS ownership of the lighthouse have resulted in piecemeal maintenance. The Cockspur Island Lighthouse underwent major repairs and replication of its iron cap in 1999, but it continues to have maintenance problems due to its location on a periodically submerged island (Meader and Binkley 2003).

The lighthouse foundation is threatened by years of erosion from storms and the active shipping channel that have lowered the height of the island and removed previous revetment, causing the island to be underwater at all times except low tide.

A revetment is a facing of masonry or the like, especially for protecting an embankment. River or coastal revetments are usually built to preserve the existing uses of the shoreline (in this case, the foundation of the lighthouse) and to protect the slope, as defense against erosion. Removal of the revetment exposes the wooden platform that supports the masonry foundation to shipworm infestation that can compromise and eventually destroy the platform.

This threat is current and loss could occur within a matter of years. An environmental assessment to evaluate the replacement of the historic revetment around the lighthouse was completed with the signing of the "Finding of No Significant Impact" on November 18, 2009. The project is nearing completion and is expected to be completed by late winter 2013.

LAND ACQUISITION

In 1935, the state of Georgia donated 297.39 acres to Fort Pulaski National Monument, including the east end of Cockspur Island and portions of the abandoned right-of-way of the Central Georgia Railroad on McQueens Island. In 1936, Congress authorized a western boundary expansion to the U.S. Public Health Service quarantine station, currently adapted for monument administrative offices, and also authorized the Secretary of the Interior to accept donated land on McQueen and Tybee islands. This legislation permitted the construction of the South Channel Bridge

and created a special reservation along the north shore of the island for the deposit of dredging materials by the U.S. Army Corps of Engineers. In 1939, the state of Georgia deeded to Fort Pulaski National Monument 5,000 acres of marshland on McQueens Island from Lazaretto Creek to the Tybee River to St. Augustine Creek, increasing monument acreage to 5,623 acres.

CULTURAL RESOURCES

Background

This section describes the cultural resources within Fort Pulaski National Monument. Cultural resources include archeological resources, historic structures, cultural landscapes, and museum collections. Several archeological surveys and investigations have taken place at Fort Pulaski since the 1960s. These surveys have provided coverage of the monument, indicated the potential locations of archeological sites, and provided information on the range of cultural resources and the likelihood of finding any additional archeological or historical sites.

Colonial Sites

A comparison of the 1766 map of Cockspur Island to those prepared by Robert E. Lee in 1830 and 1831 shows an island that had been reshaped considerably. The small hammock on which Fort George was built in 1761 had been reduced to a mud flat by 1830. It is still possible, however, that remains of the fort may be buried in the mud at the southeastern end of Cockspur Island now that the island has regained some of its former shape (NPS 2006b).

Although previous studies stated that Fort Greene, constructed from 1794 to 1795, was on or near the same location as Fort George, a letter recently found at the National Archives dated July 26, 1842, indicates that the location was near the North Channel Pier (NPS 2006b).

If Fort Greene was in fact located in the northeastern portion of the construction village, remnants may remain buried beneath the ground surface between Battery Horace Hambright and the North Channel Pier (NPS 2006b).

Efforts in 1999 to locate the Lyford Pilot House on the easternmost hardwood hammock of Cockspur Island were unsuccessful. This site was probably washed away by the hurricane that destroyed Fort Greene in 1804. Comparing the 1758 and 1766 maps prepared by Henry Yonge and William De Brahm with Lee's 1830s maps shows that much of the southeastern portion of Cockspur Island was reduced to a mud flat (NPS 2006b).

Archeological Resources

Belowground Archeological Resources. Belowground resources associated with the construction of Fort Pulaski include remains of the construction village, roadways, and mortar batteries. Dredge spoil deposited on the north shore of the island by the U.S. Army Corps of Engineers has covered the archeological remains associated with the northern portion of the construction village. Additionally, by comparing the route of the dike system as it appeared on the 1843 Mansfield map with the route of the dike system today, it is likely that repairs to the dike system in the 1930s altered the original route in the area where the Laborers' Quarters and the Blacksmith Shop stood and covered their remains (NPS 2006b).

Linear arrangements of brick and stone that, judging from their placement and alignment, correspond with the original South Channel Pier built during the fort's construction are visible on the island's marsh flats. Thus, although the South Channel Pier was washed away long ago, archeological remains are still preserved in place and are considered to be in good condition (NPS 2006b).

In August 2004, ground-penetrating radar scoping was performed in an open area west

of the visitor center parking lot. It appears that remnants of the Storm House, a kitchen, and one of the Mechanics' Quarters may be present below the ground surface (NPS 2006b).

In 1999, limited archeological investigations were conducted in the vicinity of the brickwork thought to be associated with the residence occupied by the ordnance sergeant in the 1880s. This area was labeled as an oven on a 1936 CCC map. Artifacts observed during the excavation seem to corroborate that a building was located here, but additional archeological investigations will be needed to confirm these findings (NPS 2006b).

Archeological Investigations. In October 1994, the Southeast Archeological Center conducted a noninvasive remote sensing survey to search for the graves of the Confederate prisoners of war interred at Fort Pulaski. The most probable location for the cemetery based on historic records is north of the demilune and moat near the visitor parking area. However, the results of the survey were inconclusive. None of the anomalies recorded and subsequently excavated revealed evidence of the graves (NPS 2006b).

During repairs to the northern portion of the main ditch for mosquito control by Chatham County's maintenance staff in 1995, a Civil War refuse area was exposed. A team from the Southeast Archeological Center examined the exposed refuse area, which was interpreted as a dump used by Union forces while making repairs to the fort in 1862. This interpretation was based on the location of the refuse area and the presence of complete bottles rather than bottle fragments. The presence of whole Civil War bottles helped rule out the possibility that the refuse area was the result of CCC activities from the 1930s (NPS 2006b).

In 1997, the Southeast Archeological Center conducted a survey of the dikes prior to rehabilitation to determine the original size, shape, and methods employed during construction of the dike in the 1830s. Two locations were chosen based on historic documentation that indicated they may not have been repaired over the years. Clearly visible in all profiles was a thin layer of oyster shell probably added to the top of the original dike during the CCC reconstruction. The soil used in the original construction and the original ground surface were found below this layer of oyster shell. The second location also showed evidence of repairs made by Fort Pulaski maintenance crews in the past 50 years (NPS 2006b).

Extensive excavations of the cemetery occurred in 1999, leading to the complete delineation of its boundaries. Thirty-seven separate burials were identified. Of these, 19 to 21 lie in the general area of the documented Confederate section. Based on archival research and the 1999 excavations, it is felt that most of the Union troops who died during the Civil War were exhumed, and their cemetery plots were reused by civilians and post-Civil War military personnel (NPS 2006b). In addition to the 37 burials, 5 areas of disturbance were identified. These disturbances probably had an impact on surrounding burials (NPS 2006b).

In 1999, 80 shovel tests in the assumed vicinity of Fort George, Fort Greene, and the Lyford Pilot House failed to yield any positive proof of their location. Historic documentation indicates that the search for these particular sites should focus on the mud flats at the southeastern end of Cockspur Island for Fort George and the area around the North Channel Pier for Fort Greene. It seems unlikely that enough remains of the Lyford Pilot House to warrant further archeological investigation (NPS 2006b).

In June 2008 an archeological assessment of the foundation of the Cockspur Island Lighthouse was performed by archeologist R. Steven Kidd of the Southeast Archeological Center of the National Park Service. The assessment was performed prior to an emergency stabilization project on the foundation of the lighthouse due to severe infestation by marine borers and resulting

damage to the wooden timbers that comprise the base of the lighthouse foundation. Desired results of the assessment included recording the construction methods and materials used in the lighthouse foundation and the collection and preservation of any artifacts located during the project. The assessment successfully documented the foundational supports for the lighthouse and recorded the effects of marine borer damage on the supports. Very few artifacts were observed or recovered during the project. However there were a few glass and metal items (including a largely intact brass key) recovered that were associated with the operation of the lighthouse (NPS 2008a).

Other Archeological Resources. In addition to Fort Pulaski's list of classified structures, NPS Archeologist Guy Prentice in 2005 identified a number of sites that should receive investigation. Potentially, remains of Fort Greene could be located under mud near Battery Horace Hambright along the north shore of Cockspur Island. An additional unidentified structure, possibly a barge, has been located protruding from the mud on the eastern end of Cockspur Island. Though not currently on NPS property, Prentice emphasizes the various World War II era military structures on the western end of Cockspur Island as archeologically or historically valuable should the National Park Service gain control of the property.

The Tybee Knoll Lighthouse was built in 1879 on the western side of the island overlooking the South Channel Savannah River. Later, a boat house and keeper's house were constructed on the southwestern face of the island near the lighthouse, followed by a wharf in 1888 and an oil storage shed in 1893. The lighthouse was operated in conjunction with the Cockspur Island Lighthouse by the U.S. Lighthouse Service until the early 20th century (Meader and Binkley 2003). The only extant structure is the brick oil storage shed. The keeper's house chimney foundation remains above ground. The site is not open to the public and is overgrown (NPS 2009a).

Climate change may impact archeological sites in Fort Pulaski National Monument if more erosion occurs because of increased storm frequency and intensity or sea level rise. As archeological and historic resources become submerged or compromised because of climate change, they become unavailable for archeological research, artifact recovery, and visitor enjoyment.

Museum Collections

Fort Pulaski National Monument has an extensive museum collection with the majority of the collection housed on-site. A modern super insulated storage facility consisting of a "Bally" building built into one of Fort Pulaski's casemates with an attached heat pump is used to regulate the temperature and humidity of stored museum pieces.

Tybee Knoll Oil Shed Side View

Dehumidifiers and ceiling fans are additionally used to regulate humidity in areas of Fort Pulaski containing artifacts not stored in the Bally building. The current *Collection Management Plan for Fort Pulaski National Monument* was completed in 1995 and provides details on more extensive collection management measures (NPS 1995a).

Currently the museum collection at Fort Pulaski National Monument includes 35,979 archeological, historical, and archival objects. The archeology collection includes 1,791 objects. A history section comprises 580 objects. The archival collection contains 33,600 items. The Southeast Archeological

Center manages 1 archeological item and 10 archival items for Fort Pulaski National Monument (NPD 1995).

Under the approved *Southeast Region Museum Collection Curatorial Facility Plan – May 2006,* Fort Pulaski's museum collections will be collocated with the collections of Fort Frederica and Ocmulgee national monuments in Macon, Georgia, in a facility associated with Ocmulgee (new, rented, or revamped existing facility—the details of the facility and the operations have not been developed). This will allow the Bally building to be removed from the fort and the collections stored away from the coast to mitigate damage from sea level rise and other effects of climate change, including potential natural disasters such as hurricanes.

Historic Structures

This evaluation of historic structures is taken from Fort Pulaski's list of classified structures. The list is an evaluated inventory of all historic and prehistoric structures within the monument boundary that have historical, architectural, and/or engineering significance. The list is evaluated or "classified" by the National Register of Historic Places criteria. Structures are constructed works that serve some form of human activity and are generally immovable. They include buildings and monuments, dams, millraces and canals, nautical vessels, bridges, tunnels and roads, railroad locomotives, rolling stock and track, stockades and fences, defensive works, temple mounds and kivas (ceremonial structures that are usually round and partially underground), ruins of all structural types that still have integrity as structures, and outdoor sculpture. Table 9, sorted by significance level, lists the various structures.

FORT PULASKI SOUTHWEST ANGLE

TABLE 9. LIST OF CLASSIFIED STRUCTURES

Catalog Number	Name	Significance Level
HS-09	Dike	Contributing
HS-10	Canal Lock	Contributing
HS-11	Feeder Canal	Contributing
HS-2A1	Cistern No. 5 (Ruin)	Contributing
HS-2A2	Cistern No. 4	Contributing
HS-2A4	Cistern No. 1	Contributing
HS-2A6	Cistern No. 2	Contributing
HS-2A7	Cistern No. 3	Contributing
HS2B3	Cistern No. 6	Contributing
HS2B5	Stones from Cistern (ruin)	Contributing
HS-03	North Channel Pier (Ruin)	Local
HS-06	Residence	Local
HS-2A3	Brick Foundation Ruin at Cistern No. 4	Local
HS-2A5	Brick Foundation Ruin at Cistern No. 3	Local
HS2B4	Cistern No. 7	Local
HS-01	Fort Pulaski	National
HS-07	Moat	National
HS-08	Demilune	National
CS-01	John Wesley Memorial	Not Significant
HS-13	Lieutenant Robert Rowan Grave Stone	Not Significant
HS-14	Sellmer, Charles Howard, Grave Marker	Not Significant
HS-04	Cockspur Island Lighthouse	State
HS-05	Battery Horace Hambright	State

Dike. The dike, which allowed the island to be drained, was essential to the construction of Fort Pulaski. This historic engineering structure is directly associated with Robert E. Lee, who designed it. The dike is an earthen structure approximately 4–5 feet above grade with an irregular circumference of 2 miles.

Canal Lock. The canal lock controls water flow between the moat and the feeder canal and kept tidal flooding out. This is also part of the water control system designed by Robert E. Lee. Water from the canal enters this arched brick tunnel, containing a tide gate, just before it enters the moat. The tunnel is flanked by brick retaining walls; the dimensions are 51 feet by 77 feet. A metal valve handle that controls the gate lies just north.

Feeder Canal. The feeder canal is an engineering structure that provides water to the fort's moat and is part of the water control system designed by Robert E. Lee. The canal is approximately 2,000 feet long and runs south from the moat to the South Channel Savannah River. The canal banks are earthen except near the moat, where there are brick retaining walls.

Cistern No. 5 (Ruin). This cistern, one of several that supplied water to laborers living on-site during the construction of Fort Pulaski, is significant as an example of early 19th century utilitarian structure. These are

the remains of a 15-foot-diameter round cistern. Visible on the ground surface are pieces of the stone cistern cover.

Cistern No. 4. This cistern, associated with the post-construction history of Fort Pulaski, is significant as a 19th century utilitarian structure. The 14.67-foot-diameter brick cistern has been filled with sand. No trace of cistern cover is visible.

Cistern No. 1. This cistern, one of several that supplied water to laborers living on-site during the construction of Fort Pulaski, is significant as an example of early 19th century utilitarian structure. The structure is a 9-foot-diameter circular brick cistern with a cement coating on the brick and a sandstone cap. The cistern rises approximately 4 feet above grade.

Cistern No. 2. This cistern, one of several that supplied water to laborers living on-site during the construction of Fort Pulaski, is significant as an example of early 19th century utilitarian structure. The structure is a circular brick cistern 9 feet in diameter with a sandstone cap. The cistern rises approximately 3 feet above grade, is filled with sand, and exhibits the remains of a cement coating over the brick.

Cistern No. 3. This cistern, one of several that supplied water to laborers living on-site during the construction of Fort Pulaski, is significant as an example of early 19th century utilitarian structure. The structure is a circular brick cistern, 13 feet in diameter, with a smaller, square opening set into the top. Portions of the stone cap remain along with remnants of a cement coating on the brick.

Cistern No. 6. This cistern, one of several that supplied water to laborers living on-site during the construction of Fort Pulaski, is locally significant as an example of early 19th century utility structure. The structure is a large brick, stone, and mortar cistern approximately 12 feet in diameter and 2 feet high. The cistern head is a rectangular brick box (5 feet by 5 feet) with a 3-foot square opening.

Stones from Cistern (Ruin). Apparently pieces of the cover of a cistern.

North Channel Pier (Ruin). This was the first structure built in association with Fort Pulaski and was the receiving point for materials used in the fort's construction. The ruins consist of approximately 20 feet by 10 feet of a 200-foot-long, L-shaped granite pier. Portions of the side walls, with some iron hardware, end in the remains of a tabby end wall. Granite pavers that once supported iron tracks for cannon carriages at the fort have been relocated to the end of the pier.

Residence. The residence is locally significant for architecture and its association with the U.S. Public Health Service quarantine station on Cockspur Island. Remodeled and used by the Navy as officer's quarters during World War II, the interior contains many historic features and materials from that period. In 1998, the building underwent numerous alterations that together gave the building a new appearance. These included the addition of double-hung windows to part of the porch and construction of a wide, straight flight of stairs to the east porch that never existed during the historic period. In addition, the exterior siding and porthole windows installed by the Navy to enclose the elevated foundation were removed and replaced with plywood and lattice, another feature that was never present during the historic period. The structure has been adapted for monument headquarters offices, which is its current use.

Brick Foundation Ruin at Cistern No. 4. This ruin, associated with a cistern for workers on Fort Pulaski, is significant as an example of an early 19th century utilitarian structure. The ruin is a rectangular brick platform 51 inches by 63 inches and rising approximately 12 inches above grade.

Brick Foundation Ruin at Cistern No. 3. This ruin, which is associated with a cistern that supplied water to the construction

village during the construction of Fort Pulaski, is significant as an early 19th century example of a utilitarian structure. The structure is a rectangular brick platform (85 inches by 76 inches) rising 24 inches above grade at its highest point and filled with sand. It may have supported a pump or other equipment associated with the cistern.

Cistern No. 7. This cistern, one of several that supplied water to the laborers who lived on-site during the construction of Fort Pulaski, is locally significant as an intact example of a 19th century utility structure. The structure is a large stone, brick, and mortar cistern with pedestal and head. The pedestal is composed of large stones and is approximately 5 feet by 10 feet. The cistern head is an open, rectangular box made of mortared brick and measures approximately 4 feet by 3 feet and 1 foot high.

Fort Pulaski. Fort Pulaski was a pivotal link in the Third System of U.S. coastal defense. The fort's reduction by new rifled artillery during the Civil War in April 1862 ended the era of impregnable masonry forts. The completed two tier structure is an irregular pentagon that faces east. The circumference of the fort is 1,508 feet with sides of approximately 350 feet surrounded by a wet moat. The walls are 32 feet high and 7 feet to 11 feet thick. The fort contains 64 vaulted casemates and 54 gun mounts on the terreplein. The fort includes two powder magazines and a parade ground about the size of a football field. Local brownish "Savannah Gray" brick is found in the lower walls. The rose red brick is from Baltimore, Maryland, and Alexandria, Virginia. The latter is harder than the "Savannah Grays" so is used in the arches and embrasures.

Moat. The wet moat was part of the original system of fortifications at Fort Pulaski. The moat is 32 feet to 48 feet wide and 7 feet deep surrounding Fort Pulaski and its demilune. The moat walls are brick.

Demilune. Part of the original system of fortifications at Fort Pulaski, the demilune was substantially redesigned in 1872 from a flat walled ground to a system of earthen mounds containing magazines. The triangular demilune consists of a network of four magazines, gun emplacements, and connecting passages with oyster shell-imbedded concrete walls protected by the earthen mounds.

John Wesley Memorial. The memorial marks the traditional site of the first American religious service conducted by John Wesley, founder of Methodism. It was erected by the National Society of the Colonial Dames of America in the State of Georgia, an important historic preservation group. The memorial is a 15-foot-high square column with a limestone base, a brick shaft in Flemish bond, and a limestone cap surmounted by a limestone cross, all set on a square of slate tiles. The base, cap, and a limestone plaque on the shaft carry inscriptions.

Lieutenant Robert Rowan Grave Stone. This is the grave of an officer stationed at Fort Greene, an early 19th century fort on an island that is no longer extant. The marker was moved from the site of Fort Greene to its present location. The marker consists of a marble monument (18 inches wide by 26 inches high) with an inscription and a cut top.

Sellmer, Charles Howard, Grave Marker. This is the grave of the infant son of Lieutenant Charles Sellmer and Marion Sellmer, stationed at Fort Pulaski in 1872. The grave has no significant association with the history of Fort Pulaski. The marker consists of a marble monument (10 inches wide by 2 inches deep by 24 inches high) with an inscription.

Cockspur Island Lighthouse. The Cockspur Island Lighthouse sits on an islet at the mouth of the South Channel Savannah River. It is significant for its association with an era of coastal navigation and its embodiment of a specialized architectural type. The structure originally housed a whale oil lamp; it was converted to a harbor beacon in 1909. Its use was discontinued in 1949. The lighthouse is a tapered brick tube, 16 feet in diameter and 46

feet high, with corbelled brick cornice. There is an exterior brick stair fanlight door at the first landing. An interior spiral brick stair leads to the second landing. A wooden stair leads to the third landing, which supports the iron lantern house. The lighthouse foundation is threatened by years of erosion from storms and the active shipping channel that have lowered the height of the island and removed previous revetment causing the island to be underwater at all times except low tide. This exposes the wooden platform that supports the masonry foundation to shipworm infestation that can compromise and eventually destroy the platform. This threat is current and loss could occur within a matter of years.

Battery Horace Hambright. This 1895 battery was part of the Endicott or Fourth Seacoast Defense System and was manned during the Spanish-American War. Named for Lt. Horace Hambright, it is representative of U.S. defensive architecture of the period. The battery is a steel-reinforced concrete structure with overall dimensions of 100 feet by 50 feet by 15 feet high. At ground level are three magazines with two gun emplacements above. The battery's north face is covered by a grassed earth berm.

Fort Pulaski itself and other historic structures on Cockspur Island at Fort Pulaski National Monument may be vulnerable to increased severe weather that is anticipated in the future due to climate change (Loehman and Anderson 2009). Sea level rise and an expected increase in severe weather and precipitation may increase the rate of erosion around the Cockspur Island Lighthouse and may threaten the historic cottage which has served as a quarantine station, superintendent's residence, and the current monument headquarters. Coastal fortifications may also be vulnerable to damage from changes in the freeze/thaw cycle that can affect the fabric of the structures and their foundations.

Ethnographic Resources

Although no formal ethnographic overview and assessment or other major ethnographical research has been accomplished for Fort Pulaski National Monument, research by Dr. Charles J. Elmore (Elmore 2002) and other records demonstrate that there are traditional attachments and connections between the African American community in the Savannah, Georgia, area and Fort Pulaski National Monument. These connections include the use of slaves in the construction of the fort, General David Hunter's emancipation proclamation, the use of the fort as a stop on the Underground Railroad, and the use of the fort as a haven for freed and escaped slaves subsequent to the capture of Fort Pulaski by Union forces in April 1862. Many black men were employed as boatmen, carpenters, and general laborers at Fort Pulaski in the years immediately after the Confederate surrender of the fort. Finally, the story of the "Immortal Six Hundred" resonates today among those whose ancestors fought on the side of the Confederacy and those who continue to study and work in the area of prisoners of war.

Cultural Landscapes

The area defined by the Cockspur Island Historic District is the site of Fort Pulaski, whose massive brick walls, backed by heavy piers, and casemated rooms reflected the continuing search for security against increasingly large caliber smoothbore cannon of the period. The best military engineering principles and the finest joinery and masonry techniques of the day were used in its construction (NPS 2009a).

The overarching treatment associated with the historic landscape is preservation of all identified resources. Restoration has been applied to a select number of features, primarily the restoration of the open character of the landscape to more accurately reflect the conditions at the time of the April

1862 battle and to provide the visitor with a greater understanding of the siege and reduction of Fort Pulaski (NPS 2009a).

Specific aspects of the cultural landscape described in the 2009 *Fort Pulaski National Monument Cultural Landscape Report* include the following:

- views to the North and South Channels Savannah River and Battery Park
- Fort Pulaski and the demilune
- open character of the fort parade ground
- mature fig and pecan trees in the parade ground
- mature trees growing up around the fort
- restored elevation of the historic dike and ditch system
- historic configuration of the dike and ditch system
- brick-faced tide gates
- historic ditches containing 18 inches of water at all times
- Spanish-American War Battery Horace Hambright
- Cockspur Island Lighthouse
- archeological remains of the construction village
- cisterns, the only intact aboveground resources remaining of the construction village
- Quarantine Attendant's Quarters
- stabilized North Channel Pier
- 1938 South Channel Bridge
- current configuration of the 1938 parking area
- cemetery headstones
- cemetery's boundaries as delineated in 1999 archeological investigations
- North Channel Pier Trail
- CCC era maintenance building
- World War II batteries
- John Wesley Memorial
- brick oil storage shed at the Tybee Knoll Lighthouse complex
- undetermined site of Fort Greene
- undetermined site of Fort George

Climate change, especially sea level rise and increased numbers and intensity of storms, may affect any or all of the previously listed cultural landscape elements within the boundaries of Fort Pulaski National Monument. These elements represent connections between people and the land. Sea level rise, increased storm intensity or frequency, and increased air and water temperature may damage natural or cultural resources in these locations, compromising the cultural landscapes as a whole. Resilience of these landscapes may depend on their ability to withstand both gradual and extreme weather variations.

NATIONAL PARK SERVICE MANAGEMENT OF FORT PULASKI NATIONAL MONUMENT

The first effort to convert Fort Pulaski from a surplus military property to a monument occurred in 1917 with the allocation of $500 from the United States War Department. Colonel John Millis, District Engineer of the U.S. Army Corps of Engineers in Savannah, conferred with Thomas Purse, the Savannah Board of Trade secretary, about making the old fort more visible to visitors coming to the fort by boat. Fort Pulaski was under the management of a single unpaid caretaker until 1921 and little maintenance or grounds clearing had been attempted for many years. Views of Fort Pulaski from the river channels were difficult and Colonel Millis wished to give visitors a better view. With the $500, vegetation was cut back along the ridge surrounding the fort. Better views of the fort prompted more interest in the site as a monument. By 1918, Fort Pulaski was featured in *Town and Country* magazine and Colonel Millis asked for a complete restoration of the fort and grounds. Continued interest and funding brought

about the creation of Fort Pulaski National Monument in 1924 with the support of the City of Savannah and Representative Charles Edwards of the 1st District of Georgia (Meader and Binkley 2003).

Rep. Edwards pursued additional funding for the complete restoration of Fort Pulaski and the surrounding grounds without success. The new national monument was minimally maintained and under jurisdiction of the War Department until 1932 with President Franklin Roosevelt's signing of Executive Order 6166. Like other War and Agriculture department parks and monuments, Fort Pulaski was placed under the jurisdiction of the National Park Service (Meader and Binkley 2003).

Restoration work on Fort Pulaski began in 1933 with a Civil Works Administration crew of 212 men. These men cleared vegetation from around the fort, conducted an engineering survey, and constructed a small ferry landing on the South Channel Savannah River. In 1934, both CCC Camp 460 and Public Works Administration assistance began service at Fort Pulaski. Throughout the remainder of the 1930s large-scale restoration work was performed to prepare Fort Pulaski for greater and more accessible visitation. The dike and moat system were restored, woodwork and roofing were repaired, trails were carved out of the brush, restrooms were built into the casemates, electricity was connected, and the South Channel Bridge was built connecting Fort Pulaski to McQueens Island and the mainland (Meader and Binkley 2003).

Fort Pulaski was ignored during World War II while under supervision of the U.S. Navy. During this period little maintenance was done and the fort and grounds began to look neglected. A strong hurricane additionally damaged the dike system in 1947. Not until the 1960s with the opening of a modern visitor center did Fort Pulaski again receive attention. The visitor center opened after several delays in 1964 and included additional grounds maintenance around the fort to welcome visitors. Under this period of NPS Mission 66 guidance the dikes and drainage system were repaired and various aspects of Fort Pulaski's masonry structure were repointed and restored. Modern upgrades such as asphalt roads and air conditioning were installed around the fort for visitor comfort (Meader and Binkley 2003).

After the 1960s, attention at Fort Pulaski focused on smaller maintenance and historic enhancement projects. The asphalt roads were replaced with a pebble aggregate, power lines were removed from the sight lines along U.S. Highway 80, and a museum storage facility was constructed inside one of Fort Pulaski's casemates. The South Channel Bridge has also undergone repair for safety and visitor access several times since its construction (Meader and Binkley 2003). In 2008 additional repairs to the bridge supports and surface were made to increase its life and improve safety.

OTHER INFLUENCES ON COCKSPUR ISLAND

Cockspur Island has been used by the U.S. Army Corps of Engineers, United States Navy, Savannah Pilots Association, and the U.S. Coast Guard at various times throughout the modern history of Cockspur Island.

The U.S. Army Corps of Engineers has performed dredging operations in the Savannah River since the 19th century. Dredge spoils have been deposited on the northwest shore of Cockspur Island enlarging the island and filling the salt marsh. Dredge spoils and the addition of a jetty to the north shoreline of Cockspur Island have caused extensive buildup of land along the north side of Cockspur Island. The buildup was so extensive after the jetty's construction that Cockspur Island connected with Long Island to the west (Meader and Binkley 2003).

In 1936, the U.S. Army Corps of Engineers received legal access to dump dredge spoil and use 200 feet of the north shoreline of

Cockspur Island under the Boundary Extension Act of 1936. Deposition of dredge spoil damaged wetlands, the historic dike system, and historic structures, forming a rift between the National Park Service and the U.S. Army Corps of Engineers. By 1967, the U.S. Army Corps of Engineers agreed to deposit dredge spoil on Oyster Bed Island across the North Channel Savannah River from Cockspur Island, but did not give up official rights to use Cockspur Island (Meader and Binkley 2003).

In the 1970s, the Georgia Ports Authority attempted to use Cockspur Island to access a floating transfer dock for oceangoing vessels. The project was not completed due to storm damage but shoreline stabilization was performed and an opportunity to remove the Savannah Pilots Association buildings from Cockspur Island did not materialize (Meader and Binkley 2003).

The Savannah Pilots Association has occupied a site on the north shoreline of Cockspur Island since 1940. The special use permit, under which this occupation had been continuing, was determined to be lacking in legal foundation by department attorneys. To resolve the situation the Georgia congressional delegation introduced legislation to authorize a noncompetitive lease between the National Park Service and the Savannah Pilots Association. This proposed legislation became law on December 19, 2011, when President Barack Obama signed it. The act authorizes the Secretary of the Interior to lease no more than 30,000 square feet of land and improvements at the location on Cockspur Island that has been used continuously by the Savannah Bar Pilots Association since 1940.

In 1996, the U.S. Army Corps of Engineers formally lost its right to use the north shoreline of Cockspur Island to dump dredge spoil and other activities. However, continued dredging and other provisions for the access of larger ships into the Port of Savannah present environmental concerns to Cockspur Island and Fort Pulaski National Monument. Dredging can have potentially degrading resource effects on Cockspur Island by altering Savannah River flow and unpredictably impacting shorelines and flood zones (Meader and Binkley 2003).

The U.S. Coast Guard maintains Station Tybee on the northwestern end of Cockspur Island. This site was previously used by the U.S. Navy during World War II and remained vacant until a military use was found. The U.S. Coast Guard employs 28 personnel at Station Tybee along with a wharf for docking a U.S. Coast Guard Cutter. Station Tybee is closed to the public.

NATURAL RESOURCES

Climate

Fort Pulaski National Monument is located in U.S. Department of Agriculture (USDA) Climate Zone 8 in the Georgia coastal plain. The Zone 8 climate forms a belt along the coastal plain of the southeastern United States. This belt stretches from Virginia south into Georgia and west into Texas. Coastal plain temperatures range from the high 90s to the low 20s degrees Fahrenheit (Florida State University 2009).

Fort Pulaski, located on an island and separated from the Atlantic Ocean by other barrier islands, has less range in temperature than inland parts of the Georgia coastal plain. Typical summer temperatures have highs in the 90s and lows in the 70s in degrees Fahrenheit. Normal winter temperatures range from the 40s to the 60s in degrees Fahrenheit. Freezing temperatures in winter are uncommon, but do occur. The USDA rates the temperature of Cockspur Island in terms of plant hardiness in the 8b category. The 8b category describes winter lows no lower than 15 degrees Fahrenheit (Cathey 1990). Fall and spring temperatures range greatly between the summer and winter ranges.

The geographic location of Fort Pulaski on Cockspur and McQueens Island is

susceptible to severe storms and hurricanes coming off the Atlantic Ocean. Hurricanes are not a frequent occurrence, but approximately every 4 years hurricanes significantly affect the weather conditions and approximately every 10 years a more direct hurricane hit is not uncommon. Intense wind and rain storms are frequent and sudden, occurring throughout the year (HurricaneCity.com 2009).

Precipitation is spread relatively evenly throughout the year at Fort Pulaski with an average total of 49.58 inches. The heaviest precipitation in the form of rain occurs in the late summer months with an average of 7.20 inches in the month of August.

Soils and Geologic Resources

All the soils identified within Fort Pulaski National Monument are dominated by sandy soils of the Capers series and the Tidal Marsh, Salty category. These soils occur in very poorly drained tidal marshes that have a clay-rich underlying layer. A third soil type on Cockspur Island, Made Land, is primarily the result of dredging and filling.

The Capers series soils consist of very poorly drained soils of the tidal marsh flats. The soils are flooded when tides are higher than normal.

Tidal Marsh, Salty series soils are covered daily by normal high tides and support indigenous salt-tolerant grasses. Within the estuaries, many tidal streams of varying size often dissect the marshland. Soils may be redistributed and/or relocated by strong tidal currents and shifting stream channels. Some areas are very unstable and do not support the weight of large animals.

Made Land consists of built-up areas that were formerly marshland. Generally, dredged materials from the coastal streams were added to low-lying areas. This occurred mainly along the Savannah River shipping channel. On Cockspur Island, some of the dredged materials are confined by dikes.

Climate change may impact geological resources and soils in the national monument as a result of increased storm intensity and duration. These predicted changes are expected to result in shoreline erosion, flooding, and inundation (Loehman and Anderson 2009).

Plant Communities and Vegetation

Cockspur Island, the location of Fort Pulaski, was originally grassland subject to periodic burning before the 20th century. As a result of dredge spoilage from the Savannah River, Cockspur Island has enlarged its land area, and in 2009 includes maritime forest, grassland, and woody shrub thicket (Govus 1998).

Much of the vegetation that had grown up immediately around the fort was removed in the 1970s and the monument has been managed as grasslands since. A number of red cedars, palmettos, and sugarberry trees remain in the diked area surrounding the fort. Around the visitor center, junipers and palmettos have been planted in mulched beds (Govus 1998).

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. This habitat occupies more than 140 acres on Cockspur Island and behind salt marsh communities is the second most abundant habitat present. Cultivated grass species such as Bermuda grass (*Cynodon dactylon*), Dallis grass (*Paspalum dilatatum*), vasey grass (*Paspalum urvillei*), and Bahai grass (*Paspalum notatum*) dominate but a number of native species and a few nonnative grass species are also present. Broomsedge (*Andropogon virginicus*), bushy beardgrass (*Andropogon glomeratus*), rescue grass (*Bromus catharticus*), rabbitsfoot grass (*Polypogon monspielensis*) and Mediterranean beardgrass (*Polypogon maritimus*) are examples of other grass species that can be found in these areas. A number of herbaceous species, mostly introduced, are also associated with these lawn type habitats.

Commonly found species include false dandelion (*Pyrrhopappus carolinianus*), richardia (*Richardia brasiliensis*), evening primrose (*Oenothera laciniata*), wood sorrel (*Oxalis stricta*), centella (*Centella asiactica*), pennywort (*Hydrocotyle bonariensis*) and verbena (*Verbena brasiliensis*). The proximity of Savannah, with a history of maritime trade and potential for new species from old ballast piles, makes this habitat a good site for newly introduced nonnatives. Grassy areas inside the fort have a manicured lawn appearance (Govus 1998).

Over the decades, spoil deposits from the dredging of the North Channel Savannah River and mosquito ditch dredging have been dumped on various islands, including Cockspur, creating artificial hummocks. On these hummocks, woody vegetation has taken hold. Because the majority of the spoil banks are located near the shores of the islands, rings of woody vegetation surround Cockspur Island (Govus 1998).

The following plant communities were identified on Cockspur Island in a 1998 vascular plant inventory (Govus 1998).

Lowland Temperate Seasonal Evergreen Forest.

Live Oak—Cabbage palm forest alliance. This maritime forest community is located on central Cockspur Island within the dike system, to the northwest of the fort. It represents the most well-developed and diverse forest community for this site. It is located on the highest elevation and most protected portion of the island. It differs significantly from other examples of this association along the south Atlantic Coast in that live oak is absent from both the canopy and understory layers of the community. The fact that Cockspur Island has been largely a product of spoil deposits in an area primarily of salt marsh has probably caused this anomaly. This forest, although now reaching maturity, has only developed since the early 1920s. The canopy is diverse and well-developed, including an even mixture of cabbage palm, coastal red cedar (*Juniperus virginiana var. silicicola*), sugarberry (*Celtis laevigata*), and a scattering of large American elms (*Ulmus americana*). The understory includes redbay (*Persea borbonia*) and Carolina cherry laurel. The shrub layer varies from dense thickets of yaupon to more open situations with sparse Carolina cherry laurel, wax myrtle (*Myra cerifera*) and beauty berry (*Callicarpa americana*). This is a densely shaded habitat with few herbaceous species present. Vines are an important component of this forest and Virginia creeper (*Parthenocissus quinquefolius*), pepper vine (*Ampelopsis arborea*), smilax (*Smilax auriculata*), and muscadine vine (*Vitis rotundifolia*) represent the most common species found (Govus 1998).

Coastal Red Cedar Forest—This is the most widespread forest type on Cockspur Island and occurs largely on the older spoil deposits to the west of the dike system and along the southwestern edge of the island within the dike system. The canopy typically is an even mixture of coastal red cedar, cabbage palm, and sugarberry, but variation does occur and the nonnative species Chinese tallow (*Sapium sebiferum*) and Chinaberry (*Melia azederach*) are occasionally present. In some cases, the shrub layer is absent or sparsely developed. Hercules' club (*Zanthoxulum clava-herculis*), winged sumac (*Rhus coppalina*), and wax myrtle are common members of a sparse shrub layer. In other instances, there is a dense yaupon shrub layer. Herbaceous species are generally absent, but vines such as pepper vine, muscadine, and smilax are present. The groundcover layer is typically composed of a dense cover of old cabbage palm leaves (Govus 1998).

Portions of this association occur in low-lying areas within the dike system on the southern part of Cockspur Island. The canopy here includes a significant amount of Chinese tallow. In some small areas near the mosquito control pond tallow may actually dominate. Sugarberry is also a significant part of the canopy. In these wetter situations, the shrub layer is dominated by dense, tree-like stand of yaupon, with wax myrtle present to a much lesser extent. Few to no herbaceous

species are present. Smilax and pepper vine are the most common vines (Govus 1998).

Planted/Cultivated Temperate or Subpolar Needle-leaved Evergreen Forest.

Slash Pine Planted Forest Alliance—This forest on south central Cockspur Island was planted by the National Park Service, and is the site of the picnic area. The canopy and subcanopy are composed solely of slash pine (*Pinus elliotii*). There are a few widely scattered shrubs or understory species including cabbage palm and Carolina cherry laurel. The groundcover is maintained grass and is regularly mowed. A few herbaceous species are mixed in with the grasses, including seaside pennywort (*Hydrocotyle bonariensis*) and frog fruits (*Phyla nodiflora*). This pine-dominated community is significant for nesting birds on Cockspur Island (Govus 1998).

Temperate Broad-Leaved Evergreen Woodland.

Cabbage Palm Woodland Alliance—This alliance consists of nearly pure stands of cabbage palm along the north edge of Cockspur Island, adjacent to the high marsh communities, in an area of high exposure to storm tides and salt spray. Coastal red cedar is occasionally a very minor component of the subcanopy layer. The shrub layer is usually very open but includes yaupon, wax myrtle, winged sumac, and Spanish bayonet (*Yucca aloifolia*). The groundcover layer is devoid of herbaceous species and largely consists of a dense carpet of palmetto leaves. Vine species include pepper vine and smilax (Govus 1998).

Saturated Temperate Broad-leaved Evergreen Shrubland.

Wax Myrtle Saturated Shrubland Alliance—These tree-like stands of nearly pure wax myrtle or yaupon (or a mixture of both) occur along the southern edge of Cockspur Island. They are located just above the tidal shrublands and salt pan communities of central Cockspur Island or occur within the dike system near the southeastern part of the island in very low lying areas. Occasionally, these associations include widely scattered coastal red cedars and cabbage palms. In the eastern portion (within the dike system), a substantial amount of Chinese tallow also occurs. There is not enough light to support an herbaceous layer (Govus 1998).

Tidal Cold-deciduous Shrublands.

Groundsel Tree—Maritime marsh elder tidal shrubland alliance. This community is widespread on Cockspur Island and occurs as a fringed shrubland between either salt pan communities and upland forests or high marsh communities and upland communities. It is especially well developed along the southern edge of Cockspur Island where extensive salt flats grade gently into the adjacent upland communities. In addition to groundsel tree (*Baccharis halimifolia*) and marsh elder (*Iva frutenscens*), false willow (*Baccharis angustifolia*), sea lavender (*Limnobium carolinianum*), and fimbristylis (*Fimbristylis castanea*) are present (Govus 1998).

Seaside Oxeye Tidal Shrubland Alliance—This community occurs on tidal flats adjacent to the extensive salt marsh communities of eastern Cockspur Island. Typically, this community is monospecific, being made up almost exclusively of seaside oxeye (Govus 1998).

Tidal Needle Leaved or Microphyllous Evergreen Dwarf Shrubland.

Saltwort Tidal Dwarf Shrubland Alliance—Two large examples of this association occur on hypersaline flats that grade into other salt pan communities along eastern and southeastern Cockspur Island. Saltwort (*Batis maritima*) is by far the most dominant species, but other halophytes found here include woody glasswort (*Sarcocornia perennis*), sea blite (*Sueda linearis*), sea purslane (*Sesuvium portulacastrum*), and sea lavender (Govus 1998).

Woody Glasswort Tidal Dwarf Shrubland Alliance—This association is particularly well developed on the broad gentle flats that lie along the south side of Cockspur Island. This is a hypersaline environment caused by the repeated evaporation of tidal water from these expansive shallow areas. Vegetative cover varies from a total absence of vascular plants to a dense concentration of halophytic herbs, particularly woody glasswort. Saltwort and salt grass (*Distichlis spicata*) are also abundant and usually interspersed with dwarf saltmarsh cordgrass (*Spartina alterniflora*). Additional species include sea lavender, sea blite, and sea purslane (Govus 1998).

Tidal Temperate or Subpolar Grassland.

Salt Marsh Cord Grass Tidal Herbaceous Alliance—This community is the largest present on Cockspur Island, covering more than 340 acres. It is best developed in areas between mean high and low tides that are regularly flooded. It is largely monospecific but is occasionally interspersed with patches of the needlerush (*Juncus roemarianus*) community (Govus 1998).

Salt Meadow Cord Grass Tidal Herbaceous Alliance—This "high marsh" community occurs primarily along the steep terraces of north-central Cockspur Island, which receive infrequent tidal flooding. In addition to saltmeadow cordgrass (*Spartina patens*), saltgrass, and seaside oxeye, other species found here include seaside goldenrod (*Solidago sempervirens*), sea lavender, sand vine (*Cynanchium angustifolium),* knotgrass (*Paspalum distichum*), fimbristylis, and sea beach atriplex (*Atriplex arenaria Nutt*) (Govus 1998).

Anthropogenic Habitats.

Sandy Spoil Deposits—Spoil deposits composed of nearly pure sand have been placed along the north-central and southwestern portion of Cockspur Island until 1972, resulting in young successional communities. Currently, the existing vegetation consists of widely scattered trees with large areas of exposed open sand, sparsely inhabited by a number of herbaceous species and vines. Coastal red cedar, sugarberry, cabbage palm, chinaberry, and white mulberry (*Morus alba*) are the principal trees found in this habitat. Along the north central area (east of the Savannah Pilots Association facility) the canopy is pure coastal red cedar. Shrubs scattered in these areas include wax myrtle, groundsel tree, yaupon, winged sumac, and lantana (*Lantana camara*), along with a diverse herbaceous layer (Govus 1998).

Nonnatives.

Cockspur Island is home to a number of nonnative species that tend to be invasive to natural communities. A 1998 plant inventory identified 18 such nonnatives, including sweet acacia, camphor tree (*Cinnamomum camphora*), lantana, Chinese privet (*Ligustrum sinense*), Japanese honeysuckle (*Lonicera japonica*), chinaberry (*Melia azedarach*), and Chinese tallow tree (*Sapium sebiferum*) (Govus 1998).

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 (the form and structure of organisms), distribution, growth, and reproduction. Most observed changes are linked with temperature change either directly or indirectly (e.g., altered moisture availability) (Root et al. 2003). 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. For example, lilac budburst has occurred on average three days earlier for every 1°C increase in spring temperature (Hughes 2000, Marra et al. 2005).

The spread of invasive species has been on the rise over the past 50 years due to a number of factors including climatic conditions. For example, the Chinese tallow tree has been invading coastal prairies from the Carolinas to south Texas, where periods

of flooding have decreased (Twilley et al. 2001). Harmful algal blooms (red tides) have become more extensive in recent years. Warmer coastal waters, especially in combination with nutrient pollution, can increase the intensity, duration, and extent of blooms of harmful algae and cyanobacteria (Harvell et al. 1999). Dramatic increases in Southern red cedar and palmetto palm mortality observed during 2000–2005 are probably due to the combined effects of a major drought and ongoing sea level rise (Desantis et al. 2007).

Invasive species are likely to expand their ranges northward due to shifts in temperature and precipitation patterns. Invasions may result in altered species compositions, ecosystem function, and native population declines or extinctions (McCarty 2001).

The salt marshes of McQueens Island may be able to survive rates of sea-level rise as high as 50 centimeters in 50 years, an estimate that is lower than the expected rise in sea level for much of the coastal U.S. over the next 100 years. Local subsidence or hydrologic changes, however, could increase the rate of relative sea level rise experienced by individual marshes, potentially exceeding the local threshold of some salt marshes to adapt (Boesch et al. 2000).

In general, coastal wetlands will survive if increase in sediment surface elevation equals the rate of relative sea level rise or if they are able to migrate inland or to areas of higher elevation. However, if soil accumulation does not keep pace with sea level rise, or if bluffs, coastal development, or shoreline protective structures (e.g., dikes, sea walls, and jetties) block wetland migration, wetlands may be excessively inundated or reduced in area (Scavia et al. 2002, Gilman et al. 2008).

Freshwater and brackish wetlands, common to the mid- and south-Atlantic coasts, are particularly sensitive to sustained or pulsed salinity penetration; such pulses are expected to increase in magnitude and frequency with climate change and will probably result in a transition to more salt tolerant species (Boesch et al. 2000).

Wildlife

The estuarine marshes and upland areas of Fort Pulaski National Monument support many species of wildlife. Large populations of both resident and migrant birds are present. Mammals are abundant and include marsh rabbit, raccoons, opossums, mink, otter, and deer. Cormorants, seagulls, mergansers, hawks, herons, egrets, ibis, rails, and terns can be found nesting and feeding in many of these areas. There are many species of reptiles, of which the eastern diamondback rattlesnake is poisonous. The tidal waters surrounding the fort contain a great variety of fish typical of southern coastal estuaries. The following federally listed or state listed rare, threatened, or endangered species have been documented at Fort Pulaski: American oystercatcher, bald eagle, gull-billed tern, loggerhead sea turtle, West Indian manatee, peregrine falcon, piping plover, swallow-tailed kite, Wilson's plover, and wood stork.

Point count surveys were conducted at Fort Pulaski during January, May, July, and October in 1998. A total of 7,891 birds consisting of 82 species were observed and/or heard during 13 days of surveying. Two species protected by the state of Georgia were observed, the least tern (*Sterna antillarum*) and the swallow-tailed kite (*Elanoides forficatus*). Three species that were observed during the surveys that are considered to be rare or accidental to the monument included: cliff swallow (*Petrochelidon pyrrhonota*), hooded warbler (*Wilsonia citrina*), and LeConte's sparrow (*Ammodramus leconteii*) (Rabolli and Ellington 1999).

Cockspur Island is surrounded by vast salt marshes interspersed by rivers and tidal estuaries. These tidal marshes, which are formed in conjunction with barrier island development, have delicate ecological characteristics including essential life support systems for shrimp, oysters, clams, mussels,

and the usual variety of fish found in southern coastal estuaries.

Wildlife may be affected by climate change, especially by increasing average temperatures and sea level rise. In a study of the first arrival dates of migrant birds, birds wintering in the southeastern United States arrived on average 13 days earlier (Backlund et al. 2008). Behavioral and genetic responses to climate change have been documented across multiple studies in marine, freshwater, and terrestrial ecosystems, in both plant and animal communities (Parmesan 2006). Birds have exhibited a variety of responses to warming trends including earlier breeding dates, range expansions, and asynchronous life history events (Marra et al. 2005).

In very shallow water such as bays, lagoons, or reservoirs, high surface temperatures can lead to hypoxia or anoxia (low dissolved oxygen conditions), causing massive die-offs of fish and invertebrate species. (Ebi et al. 2007). Sea-level rise could reduce essential habitat for many important marine species, such as shrimp, crabs, and smaller fish; many of these species provide an important forage base for other fishes, marine mammals, and sea birds and may therefore cause significant disturbance across taxa (groups of populations of organisms, which taxonomists adjudge to be units) and throughout food webs (Scavia et al. 2002).

Higher air temperatures may result in a shift in sex ratio of sea turtles, with more female offspring produced at higher temperatures (Booth 2006, Hawkes et al. 2007).

Populations of turtles in southern parts of the United States are currently highly female biased and are likely to become ultra-biased with as little as 1°C of warming, and experience extreme levels of mortality if warming exceeds 3°C. For example, at modeled temperature increases of 7.5°C, loggerhead turtles show 100% female hatchling production and lethally high incubation temperatures, causing reduction in hatchling production (Hawkes et al. 2007).

Aquatic Vegetation

No true "rooted" aquatic or floating vegetation exists in or around Fort Pulaski National Monument. However, during the 2008 site visit, the macroalgae known as sea lettuce (*Ulva lactuca*) was observed in tidal pools during low tide. Sea lettuce is not classified as true aquatic vegetation.

Finfish Species

The Georgia Department of Natural Resources' Wildlife Resources Division manages Georgia's fish and wildlife resources. The Savannah River supports commercial and recreational fishing. Several species of marine fish are found in the nearshore environment, in the vicinity of the project area. Observations from studies conducted indicate that the most abundant finfish species include the following: Atlantic spot (*Leistomus xanthurus*), croaker (*Micropogonias undulatus*), spotted seatrout (*Cynoscion nebulosus*), silver seatrout (*Cynoscion nothus*), weakfish (*Cynoscion regalis*), southern kingfish (*Menticirrhus americanus*), various drum species, Atlantic menhaden (*Brevoortia tyrannus*), hog choker (*Trinectes maculatus*), and bay anchovy (*Anchoa mitchelli)* (GPA 1998).

Five aquatic sites were sampled in May 1998 to identify fish using the area surrounding the monument. Site F3 was located in the South Channel Savannah River adjacent to the monument and the Cockspur Island Lighthouse. The site had significant tidal influence and was similar to much of the open water areas surrounding Cockspur Island. The fish collected during the survey at this Site F3 included the following: alewife (*Alosa pseudoharengus*), Atlantic croaker (*Micropogonias undulatus*), Atlantic needlefish (*Strongylura marina*), bay anchovy (*Anchoa mitchelli*), longnose gar (*Lepisosteus osseus*), mummichog (*Fundulus heteroclitus*), striped killifish (*Fundulus majalis*), and striped mullet (*Mugil cephalus*) (Rabolli and Ellington 1999).

Each spring and fall, the main Savannah River, Back River, Middle River, and numerous interconnecting tidal streams support the migration of three members of the herring family and include American shad (*Alosa saoidissima*), hickory shad (*Alosa mediocris*), and blueback herring (*Alosa aestivals*) as well as the striped bass (*Morone saxatilis*). Each of these species are very important game and/or commercial fish species. The American shad is the most valuable commercial anadromous fish in the Southeast (GPA 1998).

Shellfish

Shellfish thrive in estuaries and include oysters, clams, and mussels. Shellfish are filter feeders, meaning they intake large quantities of water across their gills for food and oxygen. During this process, shellfish take in bacteria, viruses, and chemical contaminants that can be stored in their digestive systems.

Oyster Creek, which is within the monument on McQueens Island, is the only area in Chatham County that is open for recreational oyster harvesting. Oyster Creek meets the high water-quality standards that are necessary to allow this activity to continue (NPCA 2007). Currently, the island on which the lighthouse stands is almost completely composed of common oyster shells, portions of which are live reefs and other portions of which are dead shell. Other shellfish observed on the island include Atlantic ribbed mussel.

Reptiles and Amphibians

Reptile species observed or captured during the 1998 through 1999 survey of the monument that could potentially use the habitat on the island include the American alligator (*Alligator mississippiensis*) and the diamond back terrapin (*Malaclemys terrapin*) (Rabolli and Ellington 1999). The American alligator currently has a status of "threatened due to similarity of appearance" because of its likeness to other crocodilians worldwide that still receive protection. The removal from total protection status allows Georgia and other Southeastern states greater flexibility in managing alligator populations. Amphibians were also captured or observed during the 1998 through 1999 survey, but those captured were primarily terrestrial and would most probably not use the habitat on the island that houses the lighthouse.

Benthic Invertebrates

In October of 2002 a benthic study was conducted in the Savannah Harbor entrance in the shallow waters east of Fort Pulaski National Monument and the Cockspur Island Lighthouse (USACE 2003). The results of 30 stations indicated that the benthic assemblages in this area were typical of assemblages found at other estuaries within the region and contained typical opportunistic and colonizing estuarine fauna; there were no hard bottom assemblages or sensitive biological taxa or taxa groups collected (USACE 2003). The station located in closest proximity to the lighthouse (station 39, approximately 1,300 feet away), was composed of the following taxa (and percentages): *Annelida* (88%), *Mollusca* (5%), *Arthropoda* (2.5%), *Echinodermata* (1%), and Other (3%). The following dominant taxa were collected at station 39: *Tubificidae*, *Mediomastus*, and *Streblospio benedicti*. At station 39, a total of 16 taxa and 157 individuals were collected, corresponding to an average station density of 3,925 organisms per square meter (USACE 2003). Compared to the other 30 stations sampled in the vicinity of the Savannah Harbor entrance, station 39 had the second highest total number of individuals and the second highest density (organisms per square meter).

Marine Mammals

Two marine mammals, the federally endangered West Indian manatee (*Trichechus manatus*) and the bottlenose dolphin (*Tursiops truncatus*), are found in the Savannah River in the vicinity of the project

area. These marine mammals are offered federal protection under the Marine Mammal Protection Act of 1972, which is enforced by U.S. Fish and Wildlife Service. The act established a moratorium on the taking or harassment of marine mammal species. The West Indian manatee is further protected as a depleted stock under the act.

Special Status Species

The near-shore federally listed species that could potentially be found within the project area are the West Indian manatee, five species of sea turtles, and the shortnose sturgeon, for which detailed descriptions are provided below. It has been determined that the remaining species of whales, with the exception of the Northern Atlantic right whale, would not specifically be found within the project area.

West Indian Manatee. The West Indian manatees (federal threatened and state endangered) are most frequently sighted in Georgia waters from April through October in the waters of Camden, Glynn, and McIntosh counties during which time wildlife biologists with the Georgia Department of Natural Resources' Nongame-Endangered Wildlife Program monitor their activities (GADNR 2008). This species is an uncommon summer visitor to the creeks and rivers around the monument. In recent years, manatees have been documented in the Savannah River, and probably occur in Oyster Creek (Rabolli and Ellington 1999) as well as within the Savannah National Wildlife Refuge (USFWS 2008). In a letter response dated March 21, 2008, the Georgia Department of Natural Resources' Natural Heritage Database documents the manatee as using tidal waters; no records of manatee occurrences have been recorded within 3 miles of the monument.

Northern Atlantic Right Whale. Northern right whales (federal endangered and state endangered) are now considered one of the most endangered large mammals in the world due to overhunting, which ended in 1935. Today there are only around 300 right whales in existence, making them close to extinction. In a letter response dated March 21, 2008, the Georgia Department of Natural Resources' Natural Heritage Database documents one occurrence of the right whale, approximately 2 miles east of the monument. These whales grow to around 55 feet long and are black with a broad, flat back and no dorsal fin. The waters of the southern U.S. are the only know calving ground for this species. This area, known as critical right whale habitat is a small strip of water extending only 5–15 miles offshore from the Altamaha River in Georgia (south of the monument) south to the Sebastian Inlet in Florida. Unfortunately, these waters contain numerous shipping lanes and collisions with ships result in 30–50% of whale deaths annually.

Loggerhead Sea Turtle. The loggerhead sea turtle (federal threatened and state threatened) is listed as threatened at both the state and federal level. Loggerheads live in marine coastal and oceanic waters. The loggerhead is the only species to nest in Georgia regularly on islands such as Jekyll Island, Sea Island, Sapelo Island, Ossabaw Island, and other barrier islands (GADNR 2008). In a letter response dated March 21, 2008, the Georgia Department of Natural Resources' Natural Heritage Database documents two occurrences of the loggerhead sea turtle; approximately 2 miles east of the monument and 2.5 miles southeast of the monument. Therefore, the loggerhead is an uncommon visitor to the creeks and rivers surrounding the monument (Rabolli and Ellington 1999). Although this species has not been observed using the spoils and beaches of the monument, it has been observed in Lazaretto Creek and Oyster Creek in recent years (Rabolli and Ellington 1999). The females nest on the upper beach or in the dunes in Georgia from late May to mid-August. Loggerheads nest from 1 to 7 times within a nesting season (mean is approximately 4.1 nests per season) at intervals of approximately 14 days. Hatchlings emerge at night approximately 50 to 60 days later and find their way to the sea

(July through November). Juveniles frequent coastal bays, inlets, and lagoons (GADNR 2008).

Green Sea Turtle. Green turtles (federal endangered and state endangered) live in estuarine and marine coastal and oceanic waters. They are generally found in fairly shallow waters inside reefs, bays, and inlets. Green turtles come ashore at beaches from June to July to nest. Nesting occurs at night on the upper beach and sand dunes, similar to the loggerhead sea turtle. Hatchlings emerge and head toward sea approximately 60 days later from August through November. Green turtles are considered infrequent nesters in Georgia (GADNR 2008). Large juveniles and adults feed on sea grasses and algae. Juveniles can be found in coastal bays, inlets, lagoons, and offshore warm reefs.

Leatherback Sea Turtle. Leatherback sea turtles (federal endangered and state endangered) are the largest of the three sea turtles occurring on the beaches in coastal Georgia. They live in oceanic waters and come ashore to nest on the beaches during the summer months. Fewer than 10 leatherback nests are recorded in Georgia each year (GADNR 2008). Hatchlings emerge and head toward sea mid-summer to early fall. They feed primarily on jellyfish (GADNR 2008).

Hawksbill Sea Turtle. The Hawksbill sea turtle (federal endangered and state endangered) is one of the smallest species of sea turtles. The Hawksbill grows up to 3 feet in carapace length and can weigh up to 180 pounds. The turtle prefers subtropical environments, and is particularly fond of clear water coral reefs and ecosystems, although they can also be found residing in rocky inland waters, mangrove-edged inlets, and bays. Hawksbill turtles do not nest in Georgia and are rarely found in Georgia's coastal waters (GADNR 2008). It is unlikely that these turtles would use the habitat surrounding the monument. These reptiles have an unusual diet consisting of fish, snails, jellyfish, starfish, sea urchins, bryozoans, and sponges. Females nest every 3 to 5 years and demonstrate a fair degree of near site fidelity. They prefer to nest on warm, smaller beaches and generally deposit their eggs in a nest excavated within the beach-side vegetation zone. The turtles can lay anywhere between 100 to 200 small eggs the size of a ping pong ball (NOAA 2008).

Kemp's Ridley Sea Turtle. The Kemp's Ridley sea turtle (federal endangered and state endangered) is the rarest and smallest of all sea turtles. It feeds in the coastal waters of Georgia on blue crabs and other crabs and shrimp. All Kemp's Ridley turtles nest on a single stretch of beach on the Gulf Coast of Mexico (GADNR 2008).

Shortnose Sturgeon. The sturgeon family is among the most primitive of the bony fishes; the shortnose sturgeon (federal endangered and state endangered) is the smallest of the three sturgeon species that occur in eastern North America, having a maximum known total length of 4.7 feet and weight of about 50 pounds. The shortnose sturgeon is anadromous, living mainly in the slower moving riverine waters or nearshore marine waters, and migrating periodically into faster moving fresh water areas to spawn (NOAA 2008). Shortnose sturgeon occur in most major river systems along the eastern seaboard of the United States and in Georgia they occur in the Savannah River (NOAA 2008) and within the Savannah River National Wildlife Refuge (USFWS 2008). Shortnose sturgeon spawning occurs in early February to mid-March in the Savannah River (NMFS 1998).

Smalltooth Sawfish. The USFWS placed the smalltooth sawfish (federal endangered and state endangered) on the endangered species list in April 2003. The species occurs in estuarine and coastal habitats, such as bays, lagoons, and rivers. Habitat destruction and overfishing has contributed to the declining population. The last remaining population of the smalltooth sawfish in U.S. waters is located off the coast of southern Florida (Passarelli and Curtis 2010).

Species Listed by the State of Georgia

The Georgia Department of Natural Resources identifies 69 Special Concern Animals as potentially occurring in Chatham County, Georgia. These species are believed to be sufficiently rare as to warrant the collecting of occurrence information to better determine their status. In a letter response dated March 21, 2008, the Georgia Department of Natural Resources' Natural Heritage Database documented listed species that occur in the vicinity of Fort Pulaski National Monument. The listed terrestrial species included on the Georgia Department of Natural Resources' natural heritage list were Florida wild privet (*Forestiera R. Fothergilla gardenii*) and the Northern yellow bat (*Lasiurus intermedius*). Aquatic-dependent species on this list include the following: false killer whale (*Pseudorca crassidens*), sited approximately 1.5 miles east of the monument; black-crowned night heron (*Nycticorax nycticorax*), sited approximately 1.5 miles east of the monument; black skimmer (*Rynchops niger*), sited approximately 1.5 miles northwest of the monument; and least tern (*Sterna antillarum*), sited approximately 2.5 miles northwest of site.

An examination of the habitats found at the monument in 1998 identified 11 listed species that probably use the habitats of the monument at some time (Rabolli and Ellington 1999). Of the 11 listed species—American oystercatcher, bald eagle, gull-billed tern, least tern, loggerhead sea turtle, manatee, peregrine falcon, piping plover, swallow-tailed kite, Wilson's plover, and wood stork—only the least tern and the swallow-tailed kite were observed at the monument during the 1998 survey. However, monument staff reported observing all 11 of these species, except for the gull-billed tern (Rabolli and Ellington 1999). Descriptions of the mobile and protected aquatic-dependent species listed by the state of Georgia (of the 11 species discussed previously) potentially found in the project area are as follows:

American Oystercatcher. (State listed as rare.) This species breeds along the Georgia coast, primarily on barrier island beaches. It is reported to be an uncommon winter visitor to the monument, but it is possible that this species could nest at the monument. Almost any bare area above high tide is suitable nesting habitat.

Bald Eagle. (State listed as endangered.) The bald eagle is an uncommon winter visitor to the area in and around the monument. The number of eagles nesting in Georgia continues to grow, and in 1998, 30 eagle nests were recorded throughout Georgia.

Gull-billed Tern. (State listed as threatened.) This species is an uncommon summer resident along Georgia's coast. The Georgia Ornithological Society (1986) reported that nesting has occurred at Tybee Island in the past. Gull-billed Tern numbers are very low in Georgia, and it is doubtful that nesting has occurred at the monument for many years.

Least Tern. (State listed as rare.) This species is a summer resident along the Georgia Coast, and may breed at the monument. The largest colonies in Georgia are found at spoil sites along the Savannah River; areas with no vegetation are good locations for nesting least terns, as well as gull-billed terns.

Peregrine Falcon. (State listed as threatened.) This species is an uncommon winter visitor to the Georgia coast, and has been observed by the monument staff in recent years.

Piping Plover. (Federally listed as endangered and state listed as endangered.) The piping plover is a winter visitor to the shores and spoil areas at the monument. As coastal development reduces wintering habitat, these spoil habitats will grow in importance. It is recommended that these spoil areas be protected from disturbance.

Swallow-tailed Kite. (State listed as rare.) A single kite was observed at the monument on May 6, 1998; the kite had not previously been reported at the monument. It is a rare

summer resident in river bottoms of the coastal plain. In Georgia, breeding is probably limited to remote areas of the Savannah and Altamaha river bottoms and the Okefenokee Swamp; the monument does not provide breeding habitat and provides limited foraging habitat.

Wilson's Plover. (State listed as rare.) The Wilson's plover is an uncommon summer resident of the shores and spoil areas at the monument and this species possibly breeds on the monument spoil mounds.

Woodstork. (Federally listed as endangered and state listed as endangered.) This species is a regular summer visitor to the monument. It has been observed feeding in the marshes surrounding the monument by monument staff.

Special status species are listed according to federal and state listed species in Chatham County, Georgia. The range of individual species varies, but Cockspur and McQueens islands have the potential to be within the range of the listed species in table 10.

David Libman, National Park Service

ALLIGATOR ON MOAT WALL

TABLE 10. SPECIAL STATUS SPECIES LISTED BY FEDERAL AND STATE AGENCIES

Species	Scientific Name	Federal Status	State Status
Mammal			
Humpback whale	*Megaptera novaeangliae*	E	E
Right whale	*Eubalaena glacialis*	E	E
West Indian manatee	*Trichechus manatus*	E	E
Bird			
Bachman's warbler	*Vermivora bachmanii*	E	E
Bald eagle	*Haliaeetus leucocephalus*	T	E
Gull-billed tern	*Sterna nilotica*	No Federal Status	T
Piping plover	*Charadrius melodus*	T	T
Red-cockaded woodpecker	*Picoides borealis*	E	E
Wood stork	*Mycteria americana*	E	E
Reptile			
Eastern indigo snake	*Drymarchon corais couperi*	T	T
Gopher tortoise	*Gopherus polyphemus*	No Federal Status	T
Green sea turtle	*Chelonia mydas*	T	T
Hawksbill sea turtle	*Eretmochelys imbricata*	E	E
Kemp's ridley sea turtle	*Lepidochelys kempi*	E	E
Leatherback sea turtle	*Dermochelys coriacea*	E	E
Loggerhead sea turtle	*Caretta caretta*	T	T
Amphibian			
Flatwoods salamander	*Ambystoma cingulatum*	T	T
Fish			
Shortnose sturgeon	*Acipenser brevirostrum*	E	E
Plant			
Climbing buckthorn	*Sageretia minutiflora*	No Federal Status	T
Narrowleaf obedient plant	*Physostegia leptophylla*	No Federal Status	T
Pondberry	*Lindera melissifolia*	E	E

Water Quality

The water quality of the Savannah River around Cockspur Island is variable in relation to tidal flows, runoff, and inflow from feeder waterways. The Georgia Department of Natural Resources, Environmental Protection Division tests tributaries and water bodies upstream specifically for drinking water quality. Most cities and towns upstream of Cockspur Island do not pull drinking water from the Savannah River, directly limiting composite data in regard to water quality at the mouth of the river. However, two mainstem water-quality testing sites, in the Savannah Harbor and upstream of Savannah, can relate water quality around Cockspur and McQueens islands. The U.S. Environmental Protection Agency, in coordination with the state Environmental Protection Division, tests coastal waters along Tybee Island. Water quality off Tybee Island in connection with water quality data in the mainstem of the Savannah River near Savannah create a water quality profile for Fort Pulaski National Monument.

Between 2000 and 2009, beach closings on Tybee Island's north beach, the closest testing location to Fort Pulaski National Monument, have numbered three: one closing in 2007 and two closings in 2004. Water quality during these periods of closure exceeded levels of organics established by the U.S. Environmental Protection Agency in the form of fecal coliform counts. Fecal coliform

counts that exceed USEPA standards for recreational waters at north Tybee Island are a result of nonpoint runoff from septic systems and stormwater discharge. Higher turbitity from silt entering stormwater runoff after heavy rains generally accompanies higher than standard fecal coliform counts. Below standard levels of fecal coliform are emitted from point source outlets into the Savannah River (USEPA 2009).

The *Savannah River Basin Plan* published by the state Environmental Protection Division outlines the basic water quality of the entire Savannah River Basin. Water quality tests revealed that several water quality indicators exceeded recommended use levels for fishing, drinking water, and coastal fishing on the mainstem of the lower Savannah River. This segment of the river is closest in proximity to Cockspur and McQueens Island and correlates with the Savannah and Tybee Island. Freshwater and coastal fishing was not recommended due to levels of mercury in largemouth bass and channel catfish. Fecal coliform counts in the lower Savannah River Basin were high enough to discourage use of Savannah River mainstem water for fishing, drinking water, and recreation (Georgia Department of Natural Resources Environmental Protection Division 2001).

Water quality near the mouth of the Savannah River, adjacent to Tybee Island, is relatively predictable and is dependent on the tidal conditions within the Savannah River (GPA 1998). Water quality parameters such as temperature, salinity, and dissolved oxygen (DO) vary uniformly with depth and with flood and ebb conditions of the river. Salinity midway in the water column ranges from 22 to 31 parts per thousand (ppt); temperatures range from seasonal highs of 28°C (82°F) while seasonal lows can be less than 11°C (52°F); typical values of DO in the mid-water column range from 5 to 7 milligrams per liter (GPA 1998).

In October 2002, water quality was collected as part of a benthic and sediment study in the Savannah Harbor entrance in the shallow waters east of the monument and the Cockspur Island Lighthouse (USACE 2003). The results of 30 stations indicated that the water quality in this area was typical of shallow estuaries within the region. At depths of 0.6 to 3.6 meters, temperature ranged from 21.9°C (71.42°F) to 23.9°C (75.02°F); salinity ranged from 14.8 to 19.4 ppt; DO ranged from 5.9 to 6.7 milligrams per liter; turbidity ranged from 8.2 to 79.4 nephelometric turbidity units. For the station located in closest proximity to the lighthouse (station 39, approximately 1,300 feet away), at 1.2 meters deep, the temperature was 22.0°C (71.6°F), salinity was 17.1 parts per trillion, DO was 6.3 milligrams per liter, and turbidity was 25.0 nephelometric turbidity units (USACE 2003).

The Clean Water Act requires that surface waters for each state be classified according to the state's designated uses. The state of Georgia, through its *Rules and Regulations for Water Quality Control,* chapter 391-3-6, revised May 29, 1994, has classified the Savannah River from mile 0 at Fort Pulaski to the open sea (including the littoral waters of Tybee Island) as recreation waters. From Fort Pulaski to mile 27.4 (Seaboard Coastline Railroad Bridge) the river is classified as coastal fishing (GPA 1998).

The Georgia Water Quality Control Act (O.C.G.A. 12-5-20) grants the state Environmental Protection Division authority to ensure that water uses in the state of Georgia are used prudently, are maintained or restored to a reasonable degree of purity, and are maintained in adequate supply. Through a memorandum of agreement between the Georgia Department of Natural Resources' Environmental Protection Division and the Georgia Department of Natural Resources' Coastal Resources Division, the rules and permits of the Environmental Protection Division are administered in a manner consistent with the enforceable policies of the Coastal Management Program. The act makes it unlawful for any person to dispose of sewage, industrial wastes, or other wastes, or to withdraw, divert, or impound any surface waters of the state without a permit.

Floodplains

Executive Order 11988, "Floodplain Management," issued May 24, 1977, directs all federal agencies to avoid both long- and short-term adverse effects associated with occupancy, modification, and development in the 100-year floodplain, when possible. Floodplains are defined in this order as "the lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum, that area subject to a one percent greater chance of flooding in any given year." Flooding in the 100-year zone is expected to occur once every 100 years, on average. In addition, NPS proposed actions that may adversely affect floodplains must comply with Director's Order 77-2: *Floodplain Management*.

All federal agencies are required to avoid building in a 100-year floodplain unless no other practical alternative exists. The National Park Service has adopted guidelines pursuant to Executive Order 11998 stating that NPS policy is to restore and preserve natural floodplain values and avoid environmental impacts associated with the occupation and modification of floodplains. The guidelines also require that, where practicable alternatives exist, class I action be avoided within a 100-year floodplain. Class I actions include the location or construction of administration, residential, warehouse, and maintenance buildings, nonexcepted parking lots, or other manmade features that by their nature entice or require individuals to occupy the site.

Fort Pulaski National Monument is located within a 100-year floodplain, Zone VE, which has been mapped by the Federal Emergency Management Agency on a flood insurance rate map issued in 2004. Zone VE is described as having a 1% chance of flooding per year with an additional high wind velocity potential (FEMA 2004).

Shoreline Erosion

The U.S. Army Corps of Engineers recently conducted a bank erosion study for Fort Pulaski National Monument and North Tybee Island for the Savannah Harbor Expansion Study (USACE undated). Unprotected portions of the monument are subject to shoreline erosion measurable from 1.6 to 3.1 feet per year, depending on specific location. The majority of erosion is due to tide, flows, river mechanics, shape and other causes unrelated to ship traffic through the channel. Ship traffic is estimated to have a minimal but measurable impact to shoreline erosion at the monument based on the predicted fleet mix and volume (USACE undated). It is estimated that 0.36 inch (about 3/8 inch maximum) of erosion could be attributed to all ship wakes during the year 2003. Using the maximum estimated erosion rate, predicting erosion for the years 2030 and 2050 is a function of ship numbers and size. If 1,258 ship calls were responsible for 0.36 inch of erosion at Fort Pulaski, then in the year 2030, 4,030 ship calls could be responsible for 1.15 inches of erosion. Similarly, in the year 2050, ship calls could be responsible for 2.23 inches of erosion, assuming the shoreline remains unprotected (USACE undated). It is probable that the small island experiences similar amounts of annual erosion described previously for the shoreline of Fort Pulaski. Other sources of erosion to the island other than shipping traffic include severe nor'easter storms, hurricanes, and rising sea level.

Wetlands

Section 404 of the Clean Water Act and a number of state laws and provisions regulate activities in wetlands. Executive Order 11990, "Protection of Wetlands," directs all federal agencies 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. In the absence of such

alternatives, parks must modify actions to preserve and enhance wetland values and minimize degradation. Consistent with Executive Order 11990 and Director's Order 77-1: *Wetland Protection*, the National Park Service adopted a goal of "no net loss of wetlands." Director's Order 77-1 states that for new actions where impacts on wetlands cannot be avoided, proposals must include plans for compensatory mitigation that restores wetlands on NPS lands, where possible, at a minimum acreage ratio of 1:1.

The National Park Service defines wetlands as vegetated areas that are flooded or saturated for duration sufficient to allow development of at least one of the three wetland indicators described in the 1987 *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987). The three wetland indicators used include wetland hydrology, hydric soil, or hydrophytic vegetation. This definition differs from that used by the Corps to delineate jurisdictional wetlands. The Corps' definition requires the presence of all three wetland indicators for an area to be classified as a wetland. This document presents wetlands as defined by the one-parameter approach adopted by the National Park Service.

Wetlands are characterized by soil type and a diversity of vegetation, including trees, shrubs, and herbaceous ground covers. Wetlands provide a variety of beneficial functions from supplying habitat for a variety of wildlife, storage and attenuation of floodwaters, trapping silts and other sediments during floods, and biologically filtering contaminants from surface waters. The National Wetlands Inventory of the U.S. Fish and Wildlife Service produces information on the characteristics, extent, and status of the nation's wetlands and deepwater habitats. The U.S. Fish and Wildlife Service definition of wetlands is similar to the NPS definition of wetlands in that only one of three parameters (hydric soils, hydrophytic vegetation, and hydrology) is required to characterize an area as a wetland, based on the Cowardin Classification of Wetlands (Cowardin 1979). National Wetlands Inventory maps are prepared by the U.S. Fish and Wildlife Service from the analysis of high altitude imagery and wetlands are identified based on vegetation, visible hydrology, and geography.

Based on the National Wetlands Inventory maps at the site from the U.S. Fish and Wildlife Service and NPS definition of wetlands, 90% of Fort Pulaski National Monument is wetlands. Of the approximately 5,600 acres that compose Fort Pulaski National Monument, 4,800 acres is salt marsh. The remaining dry acreage is isolated to the built-up landscape around Fort Pulaski and 500 acres of dredge spoil deposited on both McQueens and Cockspur Island. In addition, tidal flows partially submerge Cockspur Island twice every 24 hour period.

Tidal Influences

The main water body that surrounds the lighthouse is the South Channel Savannah River. The coastline in the Savannah area is classified as a mesotidal region (tidal ranges between 6 and 12 feet) (GPA 1998). Tidal fluctuations near the project site are semidiurnal, averaging 6.8 feet at the mouth of the Savannah Harbor and 7.9 feet at the upstream limit of the Harbor. The shorelines of Cockspur Island and McQueens Island are constantly affected by tidal flows, which change four times daily with maximum tidal currents in excess of 5 knots and a tidal amplitude of 3 to 3.5 feet. Bathymetry was recorded in the immediate Cockspur Island area in 2008 and these data show that shallow waters surround the island and gradually slope from -1 to -12 feet below mean sea level (MSL).

Wilderness Resources and Values

Approximately 90% of Fort Pulaski National Monument is classified as wetland. With more than 4,800 acres of salt marsh that are covered twice daily with nutrient-rich marine waters, the monument preserves and protects

a sizeable portion of one of the most productive and prolific ecosystems known to man. Located only a few miles from the Atlantic Ocean, the waters within monument boundaries are teeming with shrimp, oysters, clams, mussels, and the usual variety of fish found in southern coastal estuaries. The monument protects some of the most pristine resources in the area, as indicated by the presence of Class 1 waters for recreational harvest of shellfish.

Approximately 4,500 acres of undeveloped salt marsh on McQueens Island meet the criteria established by law and therefore are eligible for wilderness designation. These lands generally appear to have been affected primarily by the forces of nature with minimal evidence of human activity. These areas of Fort Pulaski National Monument offer outstanding opportunities for solitude or for primitive and unconfined recreation.

Although development is visible when looking out into the surrounding uplands, inside the marsh there are no structures or other permanent improvements, i.e., the imprint of humans' work is substantially unnoticeable. Furthermore, the National Park Service has, and will continue to, protect and manage these areas so as to preserve their natural conditions. Finally, some limited opportunities for solitude or a primitive and unconfined type of recreation exist inside these areas. Opportunities are limited not by a lack of primitive conditions, but by the nature of the salt marsh itself.

McQueens Island Marsh

VISITOR USE AND EXPERIENCE

Visitation at Fort Pulaski National Monument has been monitored since 1995. As of 2008, the mean number of recreation visitors per year since 1995 was approximately 218,000 with a median around 257,000. Recreation visits in 2008 totaled 352,636. Recreational visitation has continually been elevated in the summer months with the lowest visitation in the winter months (NPS Public Use Statistics Office 2008). The visitation season roughly corresponds to beach based tourism along nearby Tybee Island.

TABLE 11. VISITATION AT FORT PULASKI NATIONAL MONUMENT SINCE 1995

Fiscal Year	Recreational	Non-Recreational	Total Visits	Percentage Change
2009	435,661	28,800	464,461	21.77%
2008	352,636	28,800	381,436	9.44%
2007	319,734	28,800	348,534	-1.85%
2006	326,301	28,800	355,101	8.99%
2005	297,017	28,800	325,817	-8.29%
2004	326,475	28,800	355,275	-0.40%
2003	327,915	28,800	356,715	-8.52%
2002	361,129	28,800	389,929	1.28%
2001	356,209	28,800	385,009	-0.72%
2000	359,018	28,800	387,818	-0.09%
1999	359,373	28,800	388,173	0.21%
1998	358,567	28,800	387,367	3.66%
1997	344,880	28,800	373,680	3.00%
1996	333,992	28,800	362,792	5.12%
1995	316,321	28,800	345,121	

The national monument maintains an extensive museum collection that is rotated for display as previously described. In addition to museum items, living history presentations and group tours are available throughout the year. A legacy of living history demonstrations is present at Fort Pulaski National Monument with current emphasis on maintaining Fort Pulaski resources and visitor safety.

Recreational activities at Fort Pulaski include picnicking and nature viewing as well as touring the historic site and structures. A nature trail less than 1 mile long allows visitors to view the subtropical vegetation and animal life of Cockspur Island in addition to viewing the lighthouse. A boat ramp and fishing pier are located on McQueens Island just off U.S. Highway 80 at Lazaretto Creek.

SOCIOECONOMIC ENVIRONMENT

Fort Pulaski National Monument is 17 miles east of the central business district of Savannah, Georgia, on Cockspur Island in the Savannah River near the Atlantic Coast. Chatham County contains all of Fort Pulaski National Monument, the city of Savannah, and several smaller municipalities including Tybee Island to the east and Thunderbolt to the west. The metropolitan statistical area of Savannah stretches south into Bryan and Effingham counties and had an estimated population of 334,353 in 2007. Shipping, manufacturing, military, and tourism are the Savannah metropolitan area's four major industries.

Two busy ports, both owned and operated by Georgia Ports Authority, operate on the Savannah River in and near Savannah, Georgia. Ocean Terminal is immediately northwest of downtown Savannah and handles a variety of cargo from containers to bulk agricultural products with 10 berths. Garden City Terminal is approximately 3 miles northwest of Savannah in Garden City, Georgia, along the Savannah River. Garden City Terminal is the fourth largest port in the United States with 50 deep-water berths. Containers are the primary cargo moving in and out of Garden City Terminal. Trucking and rail services are linked to both ports and add significantly to the economic impact of the port facilities in the Savannah metropolitan statistical area.

The city of Tybee Island is 7 miles from Fort Pulaski National Monument and is primarily a tourism based city. Vacation rentals, condominiums, boating, fishing, and other beach activities are dominant. Tybee Island is a seasonal destination and tourism is greatest in the summer months, although

year-round residents are common. Tybee Island is part of the Savannah metropolitan statistical area.

Fort Stewart and Hunter Army Airfield are both within the Savannah metropolitan statistical area and contribute significantly to the local economy. According the Savannah Area Chamber of Commerce, the combined military facilities employ 42,000 people and generate an annual direct federal expenditure of $1.4 billion dollars (Savannah Area Chamber of Commerce 2009).

Manufacturing and related manufacturing support industries contribute to the Savannah metropolitan statistical area economy. In 2005, approximately 14,498 workers were employed in manufacturing directly and another 21,352 jobs were created through manufacturing support. Manufacturing workers earned an average salary of $56,300 per year. Manufacturing and support industries accounted for 17% of Savannah metropolitan statistical area employment and contributed 22% of regional labor income (Toma and Bice 2006).

Tourism as an industry in Chatham County, Georgia, and the Savannah metropolitan area is expressed through maritime attractions including beaches, wildlife refuges, historic sites, boating, and fishing. The city of Savannah attracts more than 6 million tourists a year to its historic downtown waterfront on the Savannah River. The historic squares of Savannah and other cultural attractions are supplemented by a variety of shopping areas, art galleries, restaurants, and festivals. Lodging, dining, entertainment, and visitor-related transportation account for more than $2 billion in visitors' spending per year and employ more than 17,000 (Savannah Area Chamber of Commerce 2009).

Population and land value trends for Savannah and Chatham County are listed in table 12. The city of Savannah population decreased from 2000 to 2008, although Chatham County's population increased by more than 8% during the same time period. Other statistics describe Chatham County as a less racially diverse, younger, and considerably wealthier area compared to its county seat and regional hub of Savannah. Persons below the poverty level in Savannah accounted for 22.7% of the population in 2007 compared to 16.3% in Chatham County.

Employment characteristics for the Savannah metropolitan statistical area include the highest rates of employment respectively in the retail trade, accommodations and food services, health care and social assistance, and state and local government sectors. Each of these sectors exceeded 18,000 jobs per sector (see figure 5). However, by examining employment and earnings together, the retail trade and accommodations and food services sectors account for approximately half the earnings compared to the sectors of manufacturing and health care and social assistance, which employ fewer people (see table 12).

Comparing earnings and employment places the health care and social services sector as the most important employment sector in terms of number jobs and total earnings in the Savannah metropolitan statistical area in which Fort Pulaski National Monument is located.

TABLE 12. COMPARATIVE SOCIOECONOMIC STATISTICS FOR CHATHAM COUNTY, GEORGIA

Location	City of Savannah	Chatham County	Georgia	United States
Population estimate 2008	130,331	251,120	9,685,744	304,059,724
Population % change 2000–2008	-0.9%	8.1%	18.3%	8.0%
White persons not Hispanic % 2007	38.1%	53.2%	58.5%	66.0%
Persons under 18 years old % 2007	25.6%	25.5%	26.5%	24.5%
Persons 65 years old and over % 2007	13.2%	12.4%	9.9%	12.6%
Housing Units 2007	60,162	113,250	3,961,474	127,901,934
Home Ownership Rate 2000	49.2%	60.4%	67.5%	66.2%
Median value of owner-occupied housing units 2000	$125,200	$95,000	$111,200	$119,600
Median household income 2007	$32,616	$45,124	$49,080	$50,740
Persons below poverty % 2007	22.7%	16.3%	14.3%	13.0%
Persons per square mile 2000	1,759.5	529.8	141.4	79.6

Data courtesy of U.S. Census Bureau, 2009

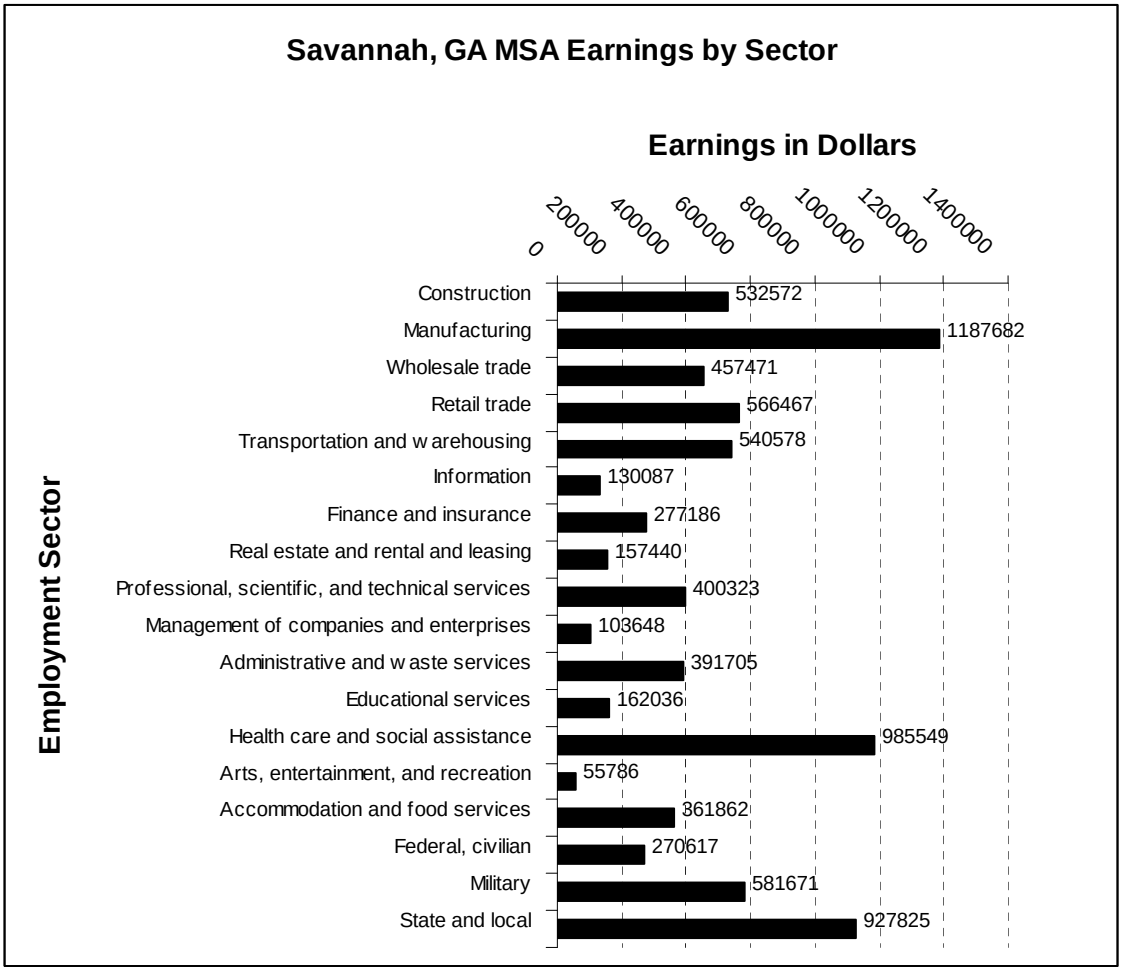

FIGURE 5. EARNINGS BY INDUSTRY IN THE SAVANNAH, GEORGIA METROPOLITAN STATISTICAL AREA 2007

Data courtesy U.S. Bureau of Economic Analysis, 2009

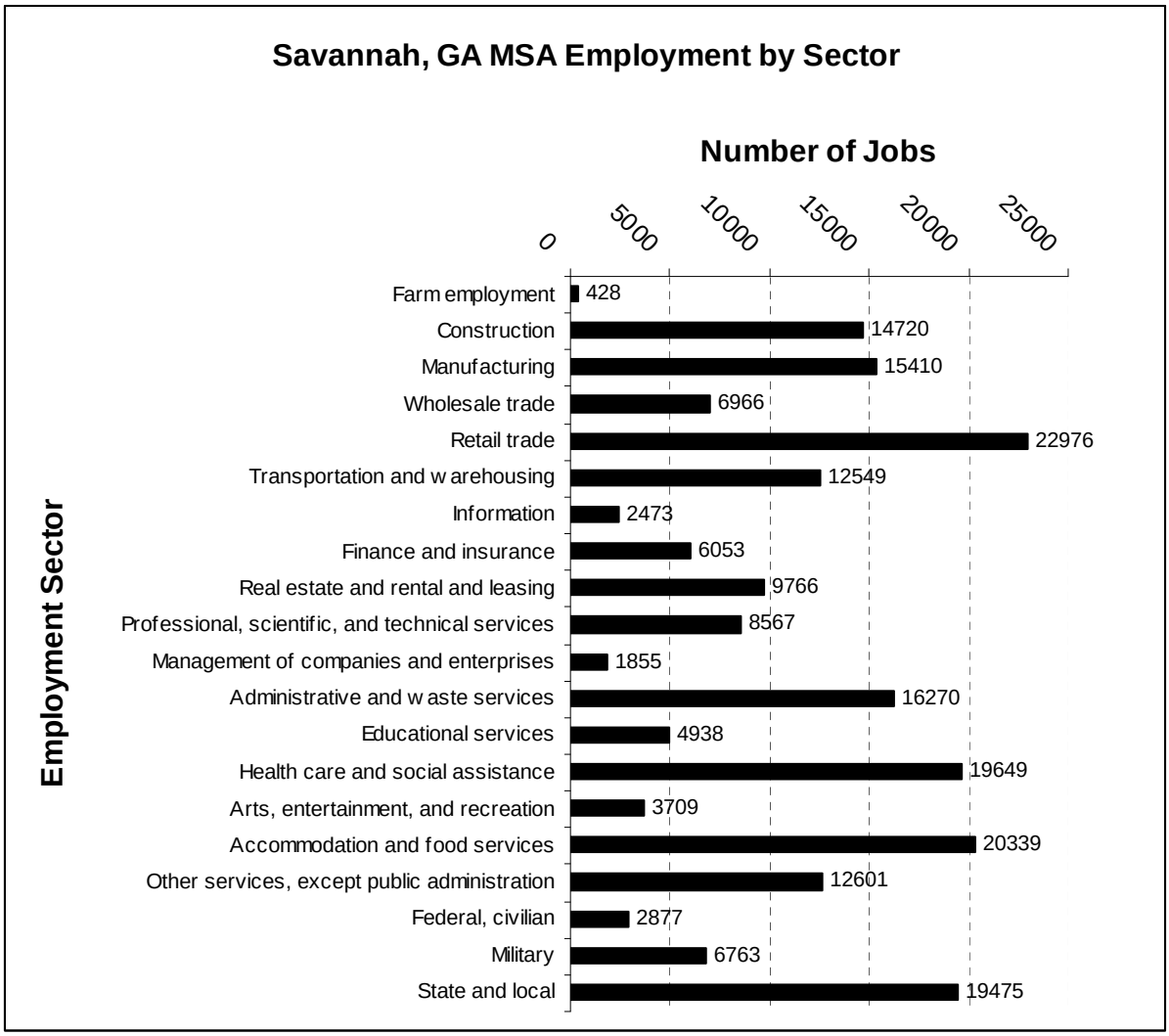

FIGURE 6. SAVANNAH, GEORGIA METROPOLITAN STATISTICAL AREA EMPLOYMENT BY INDUSTRY IN 2007

Data courtesy U.S. Bureau of Economic Analysis, 2009

TRANSPORTATION

Fort Pulaski National Monument is accessible via U.S. Highway 80 approximately 15 miles east of Savannah, and about 4 miles west of Tybee Island, at the mouth of the Savannah River. The monument is about 265 miles southeast of Atlanta (via Interstates 75 and 16 and U.S. Highway 80), 156 miles north of Jacksonville, Florida (via Interstates 95 and 16 and U.S. Highway 80), and 125 miles south of Charleston, South Carolina (via U.S. Highway 17, Interstates 95 and 16, and U.S. Highway 80).

The area is also served by the Savannah/Hilton Head International Airport, about 14 miles northwest of central Savannah and 30 miles from Fort Pulaski. The airport is located strategically near the junction of Interstates 95 and 16, and the Savannah ports, while being only minutes from the historic downtown Savannah tourism destinations.

Interstate 95 bisects the region from the South Carolina border in the north to the Florida border in the south. This interstate is the primary north/south corridor between New York City, New York, and Miami, Florida.

Interstate 16 is the primary east/west connector for central Georgia, connecting Savannah in the east with Macon and access to Interstate 75 (access to Atlanta) in the west. Interstate 16 crosses Interstate 95 in Pooler, near the Savannah port facilities, making the northern part of the region a prime location for industrial development dependent on access to multimodal transportation and infrastructure.

Port of Savannah

The Port of Savannah specializes in the handling of container, refrigerated, breakbulk, and roll-on, roll-off cargoes. The port includes the Garden City Terminal, Savannah's dedicated container terminal, and the 208-acre Ocean Terminal, a combination breakbulk and roll-on, roll-off facility handling forest and solid wood products, steel, automotive and heavy equipment, project shipments, and heavy-lift cargoes.

The North Channel Savannah River and the Savannah Harbor serve the Port of Savannah. This shipping corridor requires extensive dredging in order to maintain the depths required to accommodate oceangoing vessels. The millions of cubic yards of material removed in these operations are placed in "spoil areas" approved by the U.S. Army Corps of Engineers. Conditions for carrying out dredge operations and for disposing of dredge material are permitted and monitored by the regulatory branch of the Corps. Over the years, dredging and depositing discarded dredge material have raised concerns because of various environmental consequences. Until 1996, when Public Law 104-333 (110 Stat. 4188) was enacted, dredge spoil was deposited on Cockspur Island and Long Island. Other concerns include the effects of significantly deepened channels on conditions in adjacent shore and water-bottom areas, rates of erosion, and changes in the hydraulics of water movement created by dredging (Coastal Georgia Regional Development Center 2007).

MONUMENT OPERATIONS AND MANAGEMENT

Fort Pulaski National Monument is accessed from the southwest by crossing onto Cockspur Island from the South Channel Bridge via U.S. Highway 80 on McQueens Island. An entrance station greets visitors upon making the turn towards the South Channel Bridge from the highway. Crossing onto Cockspur Island, the road passes over the dike work and enters elevated land built up to support Fort Pulaski. The monument road proceeds to the visitor center directly west of Fort Pulaski's demilune. A parking lot has been built on the north side of the visitor center, northwest of the fort and visible from Fort Pulaski's gun deck. A spur road leads to a picnic area and the Savannah Pilots Association structures to the northwest of Fort Pulaski.

Fort Pulaski National Monument maintained 14 full-time equivalent staff positions in 2006 and up to 21 staff including temporary and part time in 2009. Full-time staff numbers have decreased from 19 to 14 since 1996. The total operating budget as of 2006 was $991,000. Since 1996, Fort Pulaski's total budget has ranged from a low in 1996 of $626,000 to a high in 2005 of $1,072, 000. The mean budget from 1996 to 2006 was $844,364 and the median budget value was $883,000.

LAND USE

Fort Pulaski National Monument's Cockspur Island location uses the Savannah River as a legal boundary. The whole of Cockspur Island is federally owned and used by the National Park Service with special use permits for the Savannah bar pilots and the U.S. Coast Guard. Because the special use permit for the bar pilots was found to be lacking in legal authority, legislation to authorize a non-competitive lease was

introduced into the 112th Congress. On December 19, 2011, President Barack Obama approved Public Law 112-69, which authorizes the Secretary of the Interior to lease no more than 30,000 square feet of land and improvements at the location on Cockspur Island that has been used continuously by the Savannah Pilots Association since 1940. A western portion of Cockspur Island was formerly used by the U.S. Navy and is off limits to visitors, having been a munitions site. The U.S. Coast Guard currently occupies this site.

Across the South Channel Savannah River, near Goat Point, on the east shore of Lazaretto Creek, was the location of the federal batteries that bombarded Fort Pulaski during the Civil War. This site is being developed as a luxury waterfront community known as Battery Row. The developer granted the monument an easement for the permanent creation of an interpretive site on the island's northern shore that allows visitors to view the damage inflicted on the southeastern angle of the fort by the rifled cannons used during the siege and reduction of Fort Pulaski on April 10–11, 1862. This viewpoint is very near the actual sites used by federal batteries to carry out the bombardment. The aerial photograph below shows the location of the Battery Park interpretive site and the line of sight to the fort. Current land uses within the Cockspur Island Historic District include recreation, interpretation, administration, law enforcement, and burial. Across the South Channel Bridge on McQueens Island, Chatham County maintains a multiuse path along a former railroad corridor. Other land uses on McQueens Island include U.S. Highway 80 and its right-of-way. U.S. Highway 80 connects Savannah to Tybee Island and it is along this corridor that development is most likely to proceed. The surrounding landscape is predominantly salt marsh and floodplain, but residential development is pressing onto Goat Point along U.S. Highway 80, the location of the Civil War era federal batteries that bombarded Fort Pulaski. Damage to documented but unidentified archeological sites are a concern at Goat Point.

Battery Park Site on Tybee Island, Showing Line of Fire from Federal batteries to Fort's Southeastern Angle

Tammy Herrell, National Park Service

ENVIRONMENTAL CONSEQUENCES

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

The National Environmental Policy Act requires that federal agencies discuss the environmental impacts of a proposed federal action, feasible alternatives to that action, and any adverse environmental effects that cannot be avoided if the proposed action is implemented. In this case the proposed federal action would be the adoption of a general management plan for Fort Pulaski National Monument. The following portion of this document analyzes the environmental impacts of implementing each of the three alternatives on natural resources, cultural resources, transportation, the visitor experience, the socioeconomic environment, and monument operations. The analysis is the basis for comparing the beneficial and adverse effects of implementing the three alternatives. By examining the environmental consequences of all alternatives on an equivalent basis, decision makers can evaluate which approach would provide the greatest beneficial results with the fewest adverse effects on the monument.

Because of the general, conceptual nature of the actions described in the alternatives, the impacts of these actions are analyzed in general qualitative terms. Thus, this environmental impact statement should be considered a programmatic analysis. If and when site-specific developments or other actions are proposed for implementation subsequent to this general management plan, appropriate detailed environmental and cultural compliance documentation will be prepared in accordance with requirements of the National Environmental Policy Act and the National Historic Preservation Act.

This chapter begins with a description of the methods and assumptions used for analyzing impacts. The impact analyses follow next, organized by alternative and then by impact topic under each alternative. All of the impact topics are assessed for each alternative. The existing conditions for each impact topic are described in chapter 3 ("Affected Environment"). For each impact topic, there is an analysis of the beneficial and adverse effects of implementing the alternative, a description of cumulative impacts (in which this plan is considered in conjunction with other actions occurring in the region), and a conclusion. At the end of each alternative there is also a brief discussion of unavoidable adverse impacts, irreversible and irretrievable commitments of resources, and the relationship of short-term uses of the environment and the maintenance and enhancement of long-term productivity. The impacts of each alternative are briefly summarized in table 7, near the end of chapter 2 ("Alternatives, Including the Preferred Alternative").

METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

The planning team based the impact analysis and the conclusions in this chapter largely on a review of existing literature and studies, information provided by experts in the National Park Service and other agencies, and monument staff insights and professional judgment. It is important to remember that all the impacts have been assessed assuming mitigation measures have been implemented to minimize or avoid impacts (under the National Environmental Policy Act only, not for impacts on cultural resources governed by section 106 of the Historic Preservation Act—see the discussion under "Cultural Resources" below). If mitigation measures described in chapter 2 were not applied, the potential for resource impacts and the magnitude of those impacts would increase.

Identification of Impacts

Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* and the accompanying *DO-12 Handbook* present an approach to identifying the impacts of a particular alternative. The analysis considers the duration (short-or long-term), type (adverse or beneficial), context (the setting within which an effect would occur), and intensity or magnitude (e.g., negligible, minor, moderate, or major) of impacts. This is the approach that has been used in this document. Where quantitative data were not available, best professional judgment was used to identify impacts.

Unless otherwise described under a specific impact topic, the duration of an impact is defined as follows:

Short-term—Impacts that would last less than 1 year and could be *temporary* in nature.

Long-term—Impacts that would last 1 year or longer and could be *permanent*.

Impacts are evaluated by type, i.e., whether the impacts would be *beneficial* or *adverse*. Beneficial impacts would improve monument resources, the visitor experience, or monument operations. Adverse impacts would negatively affect monument resources, the visitor experience, or monument operations.

Direct and *indirect* impacts caused by an action are considered in the analysis. Direct impacts are caused by an action and occur at the same time and place as the action. Indirect impacts are caused by the action and occur later in time or farther removed from the place, but are still reasonably foreseeable.

The analysis also considers the setting of impacts for each impact topic. Unless otherwise indicated, the setting for each impact topic is Cockspur and McQueens islands, together with surrounding waters.

In this document, the definition of impact intensity varies by impact topic. Individual intensity definitions can be found in table 13 below.

IMPACT TOPICS

The following impact topics are addressed in this environmental impact statement.

Cultural Resources

Method for Assessing Effects on Cultural Resources. This environmental impact assessment addresses the effects of the three plan alternatives on cultural resources—archeological sites, cultural landscapes, ethnographic resources, historic and prehistoric structures, and museum collections—that are proposed by actions in this general management plan. The method for assessing effects on cultural resources is designed to comply with the requirements of both the National Environmental Policy Act and section 106 of the National Historic Preservation Act and with implementing regulations 40 CFR 1500 and 36 CFR 800, respectively, while considering the differences in language between the two acts and recognizing that compliance with one does not automatically mean compliance with the other. Accordingly, the assessment of effects discusses the following characteristics of effects:

- direct and indirect effects
- duration of the effect (short-term, long-term)
- context of the effect (site-specific, local, regional)
- intensity of the effect (negligible, minor, moderate, major, both adverse and beneficial)
- cumulative nature of the effect

In accordance with 36 CFR 800, the regulations implementing section 106 of the National Historic Preservation Act, effects

on cultural resources are identified and evaluated in the following manner:

- Determining the area of potential effect (APE) [800.4(a)]
- Identifying historic properties in the APE that are listed in or eligible for listing in the National Register of Historic Places [800.4(b)-(c)]. The results are either:
  - *No historic properties affected*—either there are no historic properties present or there are historic properties present but the undertaking will have no effect on them [800.4(d)(1)]; or
  - *Historic properties affected*—there are historic properties that may be affected by the undertaking [800.4(d)(2)]
- Applying the criteria of adverse effect to affected historic properties in the area of APE [800.5.(a)(1)], as follows:
  - An *adverse effect* is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the national register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the national register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative. Examples of adverse effects are provided in 800.5(a)(2).
  - A finding of *no adverse effect* is found when the undertaking's effects do not meet the criteria of 800.5(a)(1) [800.5.(b)].
- Considering ways to avoid, minimize, or mitigate or otherwise resolve adverse effects. The following are considered:
  - Consultation with the Georgia Department of Natural Resources, Historic Preservation Division / tribal historic preservation officer and others to develop and evaluate strategies to mitigate adverse effects [800.6].
  - Council on Environmental Quality regulations and Director's Order 12 call for the discussion of mitigating impacts and an analysis of how effective the mitigation would be in reducing the intensity of an impact, such as reducing it from moderate to minor intensity. Any resultant reduction in impact intensity is, however, an estimate of the effectiveness of mitigation under NEPA procedures only.
  - Such reduction in impact intensity does not suggest that the level of effect as defined by section 106 and 36 CFR 800 is similarly reduced. Cultural resources are nonrenewable resources and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss of integrity that can never be recovered. Therefore, although actions determined to have an adverse effect under section 106 and 36 CFR 800 may be mitigated, the effect remains adverse.

A section 106 summary is included in the impact analysis sections. The section 106 summary provides an assessment of effect of the undertaking (implementation of the

alternative), on historic properties, based on the section 106 regulations cited previously.

Definitions for impact intensity for archeological resources, cultural landscapes, ethnographic resources, historic and prehistoric structures, and museum collections are provided in table 13 below.

Natural Resources

The natural resource impact topics analyzed in this document are climate, soils and geologic resources, plant communities and vegetation, fish and wildlife, water quality, floodplains, and wetlands. Information about known resources was compiled and compared with the locations of proposed developments and other actions. The impact analysis was based on the knowledge and best professional judgment of planners and biologists; data from monument records; and studies of similar actions and effects, when applicable. The planning team qualitatively evaluated the intensities of effects on all the natural resource impact topics.

Definitions of impact intensity as regards climate, soils/geologic resources, plant communities/vegetation, fish and wildlife, water quality, floodplains, and wetlands are presented in table 13.

Wilderness Resources and Values

The National Park Service compared the management actions of each alternative with the wilderness eligibility criteria identified in the Wilderness Act to determine how those values might be affected. Impacts were classified as adverse if they would adversely affect wilderness values or integrity. Conversely, impacts were classified as beneficial if they would enhance wilderness values or integrity.

Definitions of impact intensity as regards wilderness resources and values are presented in table 13.

Visitor Use and Experience

This impact analysis considers various aspects of visitor use and experience at Fort Pulaski National Monument, including the effects on: the range of recreational opportunities; opportunities for solitude and getting in touch with nature; visitor access including access for visitors with disabilities; opportunities for orientation, education, and interpretation; and visitor safety. The analysis is primarily qualitative rather than quantitative due to the conceptual nature of the alternatives. Impacts on visitor use and experience were determined considering the best available information regarding visitor use and experience. Information on visitor use and visitor opinions was taken from data in monument files. This information was supplemented by data gathered during the planning process for this management plan, including opinions from national monument visitors and neighbors and information provided by national monument staff.

Primarily, visitors expressed interest in preserving the natural and cultural resources of the monument, continuing to provide high-quality interpretive activities, expanding the themes interpreted by monument staff, protecting and expanding recreational opportunities, especially along the bike path and at the boat-launch facility on Lazaretto Creek, and educating visitors and neighbors about the monument's unique resources and values.

Definitions of impact intensity as regards visitor use and experience are presented in table 13.

Socioeconomic Environment

Fort Pulaski National Monument primarily operates within the local social and economic environment of the surrounding communities and regionally within Chatham County. As a result, actions proposed in the alternatives could have a direct effect on some parts of the social and economic environment of the region. In the

socioeconomic analysis, the duration of effects is considered to be either short-term (lasting less than 1 year), or long-term (lasting more than 1 year). Long-term effects could be considered as a permanent change in conditions.

Definition of impact intensity as regards the socioeconomic environment is presented in table 13.

Transportation

None of the alternatives addressed in this general management plan would change transportation patterns inside the monument to any significant degree. However, the proposed U.S. Highway 80 bridges replacement project could adversely impact the monument's natural resources, as could the proposed deepening of the Savannah River to accommodate larger container ships. Thus, the primary intent of this impact topic is to analyze impacts on monument resources caused by transportation projects outside of monument boundaries. The analysis is based in large part on studies the monument has commissioned in recent years to identify the effects of past transportation projects on monument resources.

Definitions of impact intensity as regards transportation projects are presented in table 13.

Monument Operations and Management

The impacts of the alternatives on monument operations and facilities were determined by examining the effects and changes on staffing, infrastructure, visitor facilities, and services.

Definitions of impact intensity as regards monument operations and management are presented in table 13.

David Libman, National Park Service

Fort Pulaski Maintenance Building

TABLE 13. IMPACT THRESHOLD DEFINITIONS

Impact Topic	Negligible	Minor	Moderate	Major
Cultural Resources				
Archeological Resources	The effect would be at the lowest levels of detection, barely measurable, with no perceptible consequences, either adverse or beneficial, to the resources. The section 106 determination would be no adverse effect.	The effect is measurable or perceptible, but it is slight and affects a limited area of a site or group of sites. Slight alteration(s) to any of the characteristics that qualify the site(s) for inclusion in the national register may diminish the integrity of the site(s). For purposes of section 106, the determination of effect would be adverse effect.	The effect is measurable and perceptible. The effect changes one or more of the characteristics that qualify the site(s) for inclusion in the national register and diminishes the integrity of the site(s), but does not jeopardize the national register eligibility of the site(s). For purposes of section 106, the determination of effect would be adverse effect.	The effect on the archeological site or group of sites is substantial, noticeable, and permanent. The action severely changes one or more characteristics that qualify the site(s) for inclusion in the national register, diminishing the integrity of the site(s) to such an extent that it is no longer eligible for listing in the national register. For purposes of section 106, the determination of effect would be adverse effect.
Museum Collections	The effect would be at the lowest levels of detection, barely perceptible, with no measurable consequences, either adverse or beneficial, to the collections. The section 106 determination would be no adverse effect.	The effect is measurable or perceptible, but it is slight and affects the integrity of a few items in the museum collection, but would not degrade the usefulness of the collection for future research and interpretation. Slight alteration to any of the characteristics of the collection that qualify its related resource for inclusion in the national register may diminish the integrity of the resource and its related collection. For purposes of section 106, the determination of effect would be adverse effect.	The effect is measurable and perceptible, and would affect the integrity of many items in the collection and diminish the usefulness of the collection for future research and interpretation. The effect changes one or more of the characteristics of the collection that qualify its related resource for inclusion in the national register and diminishes the integrity of the resource and its related collection, but does not jeopardize the national register eligibility of the resource related to the collection. For purposes of section 106, the determination of effect would be adverse effect.	The effect on the collection is substantial, noticeable, and permanent, and would affect the integrity of most items in the collection and destroy the usefulness of the collection for future research and interpretation. The action severely changes one or more characteristics of the collection that qualify its related resource for inclusion in the national register, diminishing the integrity of the resource and its related collection to such an extent that the resource is no longer eligible for listing in the national register. For purposes of section 106, the determination of effect would be adverse effect.

TABLE 13. IMPACT THRESHOLD DEFINITIONS

Impact Topic	Negligible	Minor	Moderate	Major
Historic Structures	The effect would be at the lowest levels of detection, barely measurable, with no perceptible consequences, either adverse or beneficial, to the resources. The section 106 determination would be no adverse effect.	The effect is measurable or perceptible, but it is slight and affects a limited area of a structure or group of structures. Slight alteration(s) to any of the characteristics that qualify the structure(s) for inclusion in the national register may diminish the integrity of the structure(s). For purposes of section 106, the determination of effect would be adverse effect.	The effect is measurable and perceptible. The effect changes one or more of the characteristics that qualify the structure(s) for inclusion in the national register and diminishes the integrity of the structure(s), but does not jeopardize the national register eligibility of the structure(s). For purposes of section 106, the determination of effect would be adverse effect.	The effect on the structure or group of structures is substantial, noticeable, and permanent. The action severely changes one or more characteristics that qualify the structure(s) for inclusion in the national register, diminishing the integrity of the structure(s) to such an extent that it is no longer eligible for listing in the national register. For purposes of section 106, the determination of effect would be adverse effect.
Cultural Landscapes	The effect would be at the lowest levels of detection, barely measurable, with no perceptible consequences, either adverse or beneficial, to the resources. The section 106 determination would be no adverse effect.	The effect is measurable or perceptible, but it is slight and affects a limited area of the landscape or few of its patterns or features. Slight alteration(s) to any of the characteristics that qualify the landscape for inclusion in the national register may diminish the integrity of the landscape. For purposes of section 106, the determination of effect would be adverse effect.	The effect on the patterns and features of the landscape is measurable and perceptible. The effect changes one or more of the characteristics that qualify the landscape for inclusion in the national register and diminishes the integrity of the landscape, but does not jeopardize the landscape's national register eligibility. For purposes of section 106, the determination of effect would be adverse effect.	The effect on the cultural landscape, its patterns and features, is substantial, noticeable, and permanent. The action severely changes one or more characteristics that qualify the landscape for inclusion in the national register, diminishing the landscape's integrity to such an extent that it is no longer eligible for listing in the national register. For purposes of section 106, the determination of effect would be adverse effect.

TABLE 13. IMPACT THRESHOLD DEFINITIONS

Impact Topic	Negligible	Minor	Moderate	Major
Ethnographic Resources	The effect would be at the lowest levels of detection, barely measurable, with no perceptible consequences, either adverse or beneficial, to the resources. The section 106 determination would be no adverse effect.	The effect is slight but noticeable, and it may result in limited changes in traditional resource access or use, or the relationship between the resource and the affiliated group's body of beliefs or practices. Slight alteration(s) to any of the characteristics that qualify the resource for inclusion in the national register may diminish the integrity of the site. For purposes of section 106, the determination of effect would be adverse effect.	The effect is readily apparent and would interfere with traditional resource access or use, or the relationship between the resource and the affiliated group's beliefs and practices, even though the group's beliefs and practices would survive. The effect changes one or more of the characteristics that qualify the resource for inclusion in the national register and diminishes the resource's integrity, but does not jeopardize the resource's national register eligibility. For purposes of section 106, the determination of effect would be adverse effect.	The effect is substantial, noticeable, and permanent, and results in significant changes in traditional resource access or use, or in the relationship between the resource and the affiliated group's beliefs and practices, to such a degree that the survival of the group's beliefs and practices is jeopardized. The action severely changes one or more characteristics that qualify the resource for inclusion in the national register, diminishing the resource's integrity to such an extent that it is no longer eligible for listing in the national register. For purposes of section 106, the determination of effect would be adverse effect.
Natural Resources				
Climate	The impact on climate would be barely perceptible, not measurable.	The impact on climate would be perceptible and measurable.	The impact on climate would be clearly detectable and could have an appreciable effect.	The impact on climate would have a substantial, highly noticeable influence on a regional scale.
Geology and Soils	The action would result in a change in soils or a geologic feature but the change would be at the lowest level of detection, or not measurable.	The action would result in a detectable change, but the change would be slight and local. Soils or geologic resources might be slightly altered in a way that would be noticeable. There could be changes in a soil's profile in a relatively small area, but the change would not appreciably increase the potential for erosion.	The action would result in a clearly detectable change in soils or geologic processes—soils would be obviously altered, or a few features would show changes. There could be a loss or alteration of the topsoil in a small area, or the potential for erosion to remove small quantities of additional soil would increase.	The action would result in the permanent loss of an important soil or geologic resource or there would be highly noticeable, widespread changes in many soils or features. There would be a permanent loss or alteration of soils or geologic resources in a relatively large area, or there would be a strong likelihood for erosion to remove large quantities of additional soil as a result of the action.

TABLE 13. IMPACT THRESHOLD DEFINITIONS

Impact Topic	Negligible	Minor	Moderate	Major
Plant Communities and Vegetation (including Exotic/Nonnative Plants)	The action might result in a change in vegetation, but the change would not be measurable or would be at the lowest level of detection.	The action might result in a detectable change, but the change would be slight. This could include changes in the abundance, distribution, or composition of individual species in a local area, but would not include changes that would affect the viability of vegetation communities. Changes to local ecological processes would be minimal.	The action would result in a clearly detectable change in a vegetation community and could have an appreciable effect. This could include changes in the abundance, distribution, or composition of nearby vegetation communities, but would not include changes that would affect the viability of plant populations in the monument. Changes to local ecological processes would be of limited extent.	The action would be severely adverse to a vegetation community. The impacts would be substantial and highly noticeable, and they could result in widespread change. This could include changes in the abundance, distribution, or composition of a nearby vegetation community or plant populations in the monument to the extent that the population would not be likely to recover. Key ecological processes would be altered, and "landscape-level" (regional) changes would be expected.
Fish and Wildlife	The action might result in a change, but the change would not be measurable or would be at the lowest level of detection.	The action might result in a detectable change, but the change would be slight and have a local effect on population. This could include changes in the abundance or distribution of individual in a local area, but not changes that would affect the viability of local populations. Changes to local ecological processes would be minimal.	The action would result in a clearly detectable change in a population and could have an appreciable effect. This could include changes in the abundance or distribution of local populations, but not changes that would affect the viability of regional populations. Changes to local ecological processes would be of limited extent.	The action would be severely adverse to a population. The effects would be substantial and highly noticeable, and they could result in widespread change and be permanent. This could include changes in the abundance of or distribution of a local or regional population to the extent that the population would not be likely to recover. Important ecological processes would be altered, and "landscape-level" (regional) changes would be expected.
Water Quality	The action would have no measurable or detectable effect on water quality or the timing and intensity of flows.	The action would have measurable effects on water quality or the timing or intensity of flows. Water quality effects could include increased or decreased loads of sediment, debris, chemical or toxic substances, or pathogenic organisms.	The action would have clearly detectable effects on water quality or the timing or intensity of surface water flows and potentially would affect organisms or natural ecological processes. The impact would be visible to visitors.	The action would have substantial effects on water quality or the timing or intensity of surface water flows and potentially would affect organisms or natural ecological processes. The impact would be easily visible to visitors.

TABLE 13. IMPACT THRESHOLD DEFINITIONS

Impact Topic	Negligible	Minor	Moderate	Major
Floodplains	Impacts would occur outside the regulatory floodplain as defined by the floodplain management guideline (100-year or 500-year floodplain, depending on the type of action), or no measurable or perceptible change in natural hydrologic processes or aquatic habitat would occur.	Actions in the regulatory floodplain would potentially interfere with or improve natural hydrologic processes or aquatic habitat in a limited way or in a local area. Levee maintenance that would protect development areas from flooding and road and trail construction that would alter natural sheet flow are example actions that would have minor adverse impacts.	Actions within the regulatory floodplain would interfere with or enhance river processes or aquatic habitat in a substantial way or in a large area. Examples of moderate adverse impacts would include modification of natural watercourses or canals in multiple locations or development of small-scale recreational facilities in the floodplain.	An action would greatly alter or improve a floodplain, natural hydrologic process, or aquatic habitat. Examples of major adverse impacts would include substantial modification of natural water-courses or canals in multiple loca-tions or development of facilities in the floodplain.
Wetlands	No measurable or perceptible changes in wetland size, integrity, or continuity would occur.	The impact would be measurable or perceptible, but slight. A small change in size, integrity or continuity could occur due to indirect effects such as storm water related runoff. However, the overall viability of the resource would not be affected.	The impact would be sufficient to cause a measurable change in the size, integrity or continuity of the wetland or would result in a small, but permanent, loss or gain in wetland acreage.	The action would result in a measurable change in all three parameters (size, integrity, and continuity) or a permanent loss of large wetland areas. The impact would be substantial and highly noticeable.
Wilderness Resources and Values	An action would have no discernible effects on wilderness resources and values.	An action would have detectable effects on wilderness resources and values, affecting the ability for a small area to meet wilderness eligibility criteria or improving and protecting its wilderness characteristics.	An action would have clearly detectable effects on wilderness resources and values, affecting the ability of an area to meet wilderness eligibility criteria or improving and protecting its wilderness characteristics. The impact would be visible to visitors.	An action would have substantial effects on wilderness resources and values, eliminating the characteristics that make substantial areas eligible as wilderness or improving and protecting its wilderness characteristics. The impact would be easily visible to visitors.

TABLE 13. IMPACT THRESHOLD DEFINITIONS

Impact Topic	Negligible	Minor	Moderate	Major
Visitor Use and Experience				
Visitation of Historic Sites / Recreational Activities	Visitors would probably be unaware of any effects associated with implementation of the alternative. There would be no noticeable changes in visitor use and/or experience or in any defined indicators of visitor satisfaction or behavior.	Changes in visitor use and/or experience would be slight but detectable, but would not appreciably diminish or enhance critical characteristics of the visitor experience. Visitor satisfaction would remain stable.	Few critical characteristics of the desired visitor experience would change and/or the number of participants engaging in an activity would be altered. The visitor would be aware of the effects associated with implementation of the alternative and would probably be able to express an opinion on the changes. Visitor satisfaction would begin to either decline or increase as a direct result of the effect.	Multiple critical characteristics of the desired visitor experience would change and/or the number of participants engaging in an activity would be greatly reduced or increased. The visitor would be aware of the effects associated with implementation of the alternative and would probably express a strong opinion about the change. Visitor satisfaction would markedly decline or increase.
Socioeconomic Environment				
Local Economy	The effect would be below detectable levels or detectable only through direct means, with no discernible effect on the character of the social and economic environment. Effects identified as neutral would be actions that do not produce any changes at all to the social and economic environment.	The effect would be detectable but limited in geographic extent or size of population affected and not expected to alter the character of the established social and economic environment.	The effect would be readily detectable across a broad geographic area or segment of the community and could have an appreciable effect on the social and economic environment.	The effect would be readily apparent, affect a large segment of the population across the entire community and region, and would have substantial effect on the social and economic environment.
NPS Operations and Management				
NPS Operations and Management	The effect would be at or below the level of detection, and would not have an appreciable effect on monument operations and management.	The effects would be detectable, but would be of a magnitude that would not have an appreciable effect on monument operations and management.	The effects would result in a change in monument operations and management in a manner readily apparent to staff and possibly to the public.	The effects would result in a substantial and widespread change in monument operations and management in a manner readily apparent to staff and the public.
Transportation	The impact on transportation patterns would be barely perceptible, not measurable.	The impact on transportation patterns would be perceptible and measurable.	The impact on transportation patterns would be clearly detectable and could have an appreciable effect.	The impact on transportation patterns would have a substantial, highly noticeable influence on a regional scale.

CUMULATIVE IMPACT ANALYSIS

A cumulative impact is described in the Council on Environmental Quality's regulation 1508.7 as follows:

Cumulative impacts are incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other action. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

Likewise, 36 CFR 800.5(a)(1) similarly defines (and requires consideration of) cumulative effects:

Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be *cumulative*.

To determine potential cumulative impacts, other projects within and surrounding Fort Pulaski National Monument were identified. The area included Chatham County and the city of Savannah. Projects were identified via discussions with monument staff and representatives of county and city governments. Potential projects identified as cumulative actions included any past activities and any planning or development activity that was currently being implemented, or that would be implemented in the reasonably foreseeable future.

These past, current, and reasonably foreseeable actions are evaluated in conjunction with the impacts of each alternative to determine if they have any cumulative effects on a particular natural, cultural, or socioeconomic resource or visitor use. Because most of these cumulative actions are in the early planning stages, the qualitative evaluation of cumulative impacts was based on a general description of the project.

Past Actions That Could Contribute to Cumulative Effects

As detailed in Alexander (2008), Cockspur Island was originally a series of small upland islands, or hammocks, surrounded by salt marsh. Fort George, the first fort on Cockspur Island, was constructed along the southeastern portion of the island during 1761. In 1829, construction of Fort Pulaski began under the direction of engineer Robert E. Lee for the purpose of guarding the river approaches to Savannah. Throughout the Civil War, the military kept island vegetation closely cut to maintain a clear field of view.

The first known maintenance harbor dredging around Fort Pulaski occurred in 1867. Additional dredging occurred as the harbor and port developed. At present, maintenance dredging occurs annually. Major channel deepening events and depths of the river channel are

- In 1929–1930, deepened from 26 feet to 30 feet (4-foot increase)
- In 1950–1951, deepened from 30 feet to 36 feet (6-foot increase)
- In 1955–1966, deepened from 36 feet to 40 feet (4-foot increase)
- In 1993–1994, deepened from 40 feet to 44 feet (4-foot increase)

Cockspur Island is a dynamic habitat and has undergone many physical changes throughout its history. At first frequently inundated by storms, the island has been physically altered over time by the accumulation of upland habitat. This habitat has developed primarily as a result of dredge spoil deposition, structural modifications associated with the construction of fortifications, and natural processes, including storm events.

Deposition of dredge spoil material along the island edge has increased the area of upland habitat, providing protection from storm wash-over and allowing for the establishment of forests. The island is

approximately 45% dry land today, with 260 acres of upland supporting successional phases of maritime forest habitat.

Beacons, lighthouses, and quarantine stations have existed on Cockspur since the 18th century. The North Channel Pier was constructed around 1828 to facilitate the unloading of building supplies, and channel ditches and embankments were constructed to control flooding. Cockspur Island Lighthouse was originally completed in 1848, damaged during an 1854 storm, and rebuilt in 1856. The lighthouse remained in continuous operation until June 1909, after which it served as a harbor beacon. From 1869 to 1872, the U.S. Army Corps of Engineers remodeled the demilune, a work constructed beyond the main ditch of the fort. It also installed underground magazines and passageways. Much of the land mass along the north and west shores was built up with dredge spoil during the 1880s. A series of jetties were constructed around the mouth of the Savannah River from 1884 to 1896, establishing a channel depth of 19 feet below mean low water. A quarantine station was built atop sand and ballast deposits along the North Channel Savannah River during 1891. Multiple requests for additional dredge material around the station followed due to its position one foot above spring tides. Additionally, hydraulic fill was placed between Jones Island and Oyster Bed Island between 1929 and 1930.

The act of June 26, 1936, (49 Stat. 1979) reserved for the U.S. Army Corps of Engineers a strip of land along the north shore of Cockspur Island extending shoreward 200 feet from the then existing high water line for the deposition of dredge materials and for "other purposes." This authority was last exercised in 1943, and resulted in obliteration of the marsh vegetation and drainage system. After dredging west of the quarantine station in 1939, the Corps reconstructed the shoreline adjacent to the station with dredge spoil. The Corps also rebuilt a small dock and placed riprap along the new shoreline to prevent erosion. Additionally, the wharf was removed to mitigate obstruction to the channel's current.

Workers for the National Park Service resided on Cockspur Island from 1960 to 1963, their efforts directed toward renovating the nonfunctional islandwide drainage system. During this same time period, the Chatham County Mosquito Control Commission excavated canals and filled low areas on the island for mosquito control. In 1972, the Corps constructed revetments and restraining walls to reduce shoaling in the North Channel Savannah River and to protect the facilities of the Savannah Pilots Association.

Current and Future Actions That Could Contribute to Cumulative Effects

It can be anticipated that Fort Pulaski National Monument will continue to be affected by regional population growth, with attendant impacts from increased visitation, continued development of adjacent lands, increased storm water runoff, increased upstream discharges of air and water pollutants, and the like. In addition the following future projects outside the monument could contribute to cumulative impacts:

- Proposed U.S. Highway 80 bridges replacement project—This project would replace or modify the bridges over Bull River and Lazaretto Creek, construct bicycle and pedestrian facilities that link to Tybee Island and McQeens Island Trail, provide additional capacity at specific locations to provide congestion or incident relief, and improve conditions in flood-prone areas.
- Savannah Harbor Deepening Project—The Georgia Ports Authority proposes to deepen the main channel of the Savannah River all the way from the river's mouth to the Garden City Terminal. The channel would be deepened from 42

to 48 feet in order to accommodate larger vessels coming through the Panama Canal.

- Georgia-South Carolina Joint Terminal Project—This proposed port facility would be built in addition to, or in lieu of, the Savannah Harbor deepening project. It would be located in Jasper County, South Carolina, just upstream from the monument.

DECISION MAKING TO AVOID IMPAIRMENT OR UNACCEPTABLE IMPACTS ON RESOURCES OF FORT PULASKI NATIONAL MONUMENT

Impairment

In addition to determining the environmental consequences of implementing the preferred and other alternatives, NPS *Management Policies 2006* (section 1.4) requires analysis of potential effects to determine whether or not proposed actions would impair monument resources and values.

The fundamental purpose of the National Park System, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve monument resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on monument resources and values. However, the laws do give the National Park Service the management discretion to allow impacts on monument resources and values when necessary and appropriate to fulfill the purposes of the monument, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given NPS management discretion to allow certain impacts within a national monument, that discretion is limited by the statutory requirement that the National Park Service must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of monument resources and values, including opportunities that otherwise would be present for the enjoyment of those resources or values. (NPS *Management Policies 2006*, section 1.4.5) An impact on any monument resource or value may, but does not necessarily, constitute an impairment. An impact would be more likely to constitute impairment to the extent it affects a resource or value whose conservation is

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the monument, or
- key to the natural or cultural integrity of the monument or to opportunities for enjoyment of the monument, or
- identified in the monument's general management plan or other relevant NPS planning documents as being of significance

Impairment may result from NPS activities in managing the monument; visitor activities; or activities undertaken by concessioners, contractors, and others operating in the monument.

Please note that, in accordance with recent NPS policy, "Appendix E: Determination of Impairment" has been removed from this plan and will instead be attached to the Record of Decision for the *Final General Management Plan / Wilderness Study / Environmental Impact Statement*.

Unacceptable Impacts

The impact threshold at which impairment occurs is not always readily apparent. Therefore, the National Park Service applies a standard that offers a greater assurance

that impairment will not occur. The National Park Service does this by avoiding impacts that it determines to be unacceptable. These are impacts that fall short of impairment, but are still not acceptable within a particular park's environment. Guidelines for the identification of unacceptable impacts are provided in NPS *Management Policies 2006,* section 1.4.7.1 (NPS 2006a).

Virtually every form of human activity that takes place within a park has some degree of effect on park resources or values, but that does not mean the impact is unacceptable or that a particular use must be disallowed. Therefore, for the purposes of these policies, unacceptable impacts at Fort Pulaski National Monument are impacts that, individually or cumulatively, would

- be inconsistent with the park's purposes or values
- impede the attainment of the park's desired future conditions for natural and cultural resources as identified through the park's planning process
- create an unsafe or unhealthful environment for visitors or employees
- diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values
- unreasonably interfere with
  - park programs or activities
  - an appropriate use
  - the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park
  - NPS concessioner or contractor operations or services

In accordance with NPS *Management Policies 2006* (NPS 2006a), park managers must not allow uses that would cause unacceptable impacts on park resources. To determine if unacceptable impacts could occur to the resources and values of Fort Pulaski National Monument, the impacts of both existing and proposed actions in this general management plan have been evaluated, based on the preceding criteria.

Comparison of Alternatives

Once impacts are identified, each alternative is compared to a baseline, represented by future conditions that would occur under the no-action/continue current management alternative (alternative A). For the no-action alternative, the impact analysis compares future resource conditions in 2024 to existing conditions in 2009, assuming continuation of current management direction.

The impact analysis for the action alternatives (alternatives B and C) compares the action alternatives in the year 2024 to the no-action alternative in the year 2024. Said differently, the description of the impacts of the action alternatives sets forth the *difference between* implementing the no-action alternative and implementing the action alternatives. To fully understand the impacts of implementing any of the action alternatives, the reader must take into consideration the impacts that would occur under the no-action alternative.

IMPACTS COMMON TO ALL ALTERNATIVES

Transportation

Under all of the alternatives, existing transportation flows within the monument would be maintained in essentially their current form. Visitation levels may increase under all of the alternatives, due primarily to rising population in the local area, with impacts on monument roads, U.S. Highway 80, and roads in adjacent communities that would be minor to moderate, long term and adverse. Impacts to monument natural

resources (particularly geologic resources and soils, vegetation, and wildlife) from the monument road and parking system would be negligible to minor, long term, and adverse. No impacts are anticipated to cultural resources.

Cumulative Effects. The proposed U.S. Highway 80 bridges replacement project could affect both transportation patterns and national monument resources. Land from within the current monument boundary could be required to accommodate various elements of the U.S. Highway 80 bridges replacement project, and this land could conceivably contain cultural resources on it. Impacts could possibly be mitigated by the donation of state land that has important natural and cultural resources.

Two proposed harbor projects could likewise affect transportation patterns and monument resources. The Savannah Harbor Expansion Project would involve deepening 36 miles of the navigation channel an additional 6 to 8 feet and widening bends at 12 locations. Specifically, the Georgia Ports Authority has proposed to deepen the 36-mile portion of the Savannah River from Fort Pulaski (at river mile 0) to above the Kings Island Turning Basin from its current 42-foot depth to a depth of 48 feet. Possible adverse effects associated with the proposed deepening include its effects on water conditions (i.e., surface water salinity, groundwater intrusion, dissolved oxygen, water clarity, contaminant concentrations), and how those in turn might affect freshwater wetlands and aquatic resources (e.g., striped bass, shortnose sturgeon). Additional impacts include a possible increase in the rate of erosion to the north shore of Cockspur Island. There are significant cultural resources in the northeast section of Cockspur Island near the river's mouth, and this area has been exclusively erosional for the past 40 years, and continues to be so today (Alexander 2008). Although a recent study was unable to draw a clear link between shoreline erosion and river channel deepening, it noted that the historic placement of dredge spoil and other anthropogenic activities on the north shore of Cockspur has impeded erosion along the river bank. Based on data obtained after these activities ceased, it appears that the northeast portion of Cockspur Island would probably have been erosional throughout the last century had it not been for these activities. This area bears the full brunt of energy from both weather systems and shipping activity in the river. Harbor traffic has been increasing steadily with time, and so harbor-related impacts on the shoreline must be increasing as well.

The second project is a proposed bi-state container port on the Savannah River at Hardeeville, South Carolina (Jasper County). If built, the port would be 10 miles closer to the ocean than the Port of Savannah's Garden City Terminal. Possible effects include adverse impacts on water quality and physical effects associated with port development (e.g., dredging, channel maintenance, deepening, etc.). Additional impacts could include exacerbation of erosive forces on the north shore of Cockspur Island.

When the long-term, negligible to minor, and adverse effects of implementing any of the action alternatives are added to the moderate to major effects of other past, present, and reasonably foreseeable actions as described previously, there would be long-term, moderate to major, adverse cumulative impacts on monument geological resources, soils, vegetation, fish, and wildlife as a result of transportation projects. Any one of the action alternatives would contribute a negligible increment to this cumulative impact.

Conclusion. Impacts to transportation under all alternatives would be negligible to minor, long term, direct, and adverse. Moderate to major impacts on a number of the monument's natural resources could ensue from deepening the Savannah River ship channel and constructing the proposed Jasper Port, both of which would take place outside the monument boundary.

CLIMATE CHANGE

Under all of the alternatives, existing emissions of greenhouse gases would initially continue more or less in their current form. No major new development or increase in vehicle usage is contemplated under any of the alternatives. Over time, however, the monument will implement the Climate Friendly Parks program developed jointly by the National Park Service and the U.S. Environmental Protection Agency. This program may lower emissions and reduce the monument's overall carbon footprint. Possible elements of the program at Fort Pulaski could include greater use of energy-efficient vehicles, less frequent mowing of open areas, and more effective recycling and re-use strategies. In themselves, impacts from these activities would be negligible, direct and indirect, long term, and beneficial. When combined with similar efforts elsewhere, beneficial impacts would be greater, albeit difficult to quantify.

Cumulative Effects. Because it is a coastal monument, Fort Pulaski National Monument is more vulnerable than inland areas to the projected consequences of global climate change, including sea level rise and more violent and frequent storm events. The National Park Service and the United States Geological Survey have developed coastal vulnerability index maps for a number of coastal monuments. These maps identify coastal areas sensitive to sea-level rise, and will allow managers to take precautions necessary for their protection. Records show that sea levels at Fort Pulaski are rising at a rate of 13 inches per century. Levels could rise another 25 inches by 2100 if the current rate of climate change continues. These changes in sea level could disrupt ecological services (nutrient recycling, sedimentation, primary/secondary productivity) provided by wetlands due to changes in hydrology and physical structure, biogeochemistry, vegetation, and animal populations (Michener et al. 1997). In addition, Georgia is expected to experience a predicted increase in temperatures by as much as 4°F (~2°C; fall) and in precipitation by as much as 40% (summer/fall) (USEPA 1997). Together, all of these changes have major implications for Fort Pulaski's salt marsh and shoreline areas because they could lead to loss of wetlands and serious erosion (McFarlin and Alber 2005). Rising sea levels could also affect the structural integrity of the fort.

The monument would have extreme difficulty adapting to such changes, because they would entail outright loss or significant damage to the resources the monument was established to protect. Impacts would be major, direct, long term, and adverse. The alternatives in this plan would contribute a negligible increment to this adverse impact.

Conclusion. Direct impacts on climate under all alternatives would be negligible, long term, direct and indirect, and adverse. Major, long-term, and adverse impacts on monument resources could ensue from global climate change. The alternatives in this plan would contribute a negligible increment to this adverse impact.

IMPACTS OF IMPLEMENTING ALTERNATIVE A (CONTINUE CURRENT MANAGEMENT)

Cultural Resources

Archeological Resources. Under alternative A, impacts on archeological resources could result from visitor activities such as hiking, picnicking, cycling, and exploring. Trampling or disturbance could result in a loss of surface archeological materials, alteration of artifact distribution, and a reduction of contextual evidence. Additional impacts on archeological resources could occur due to soil erosion from existing roads and trails, soil disturbance due to the construction of new or expanded trails, shoreline erosion from ongoing shipping activities in the Savannah River, soil compaction at trailheads and parking areas, and soil disturbance resulting from miscellaneous facility maintenance activities. Apart from shoreline erosion, the impacts of which are difficult to predict, the impacts related to these activities would for the most part be confined to surface soil layers and take place in previously disturbed areas. Impacts would thus be permanent, adverse, and of negligible to minor intensity. Archeological resources adjacent to or easily accessible from roads or trails could be vulnerable to looting and vandalism. Continued ranger patrol and emphasis on visitor education would minimize adverse effects and any adverse effects would be anticipated to range in intensity from negligible to minor and be permanent. There is no potential for impacts on archeological sites resulting from facility development.

Cumulative Impacts—Ongoing monument management and visitor use activities have resulted in relatively little disturbance of archeological resources in the monument. Large-scale projects such as deepening the Savannah River ship channel could pose some impacts on archeological resources in the vicinity of the monument. The number and extent of these archeological resources is unknown so the potential impact cannot be assessed with any degree of accuracy. However, the impacts of the federal channel project will be assessed in separate environmental compliance documents being prepared by the U.S. Army Corps of Engineers. When the permanent, negligible to minor adverse effects of implementing the actions under alternative A are added to the minor effects of other past, present, and reasonably foreseeable actions as described previously, there would be a permanent, negligible to minor, adverse cumulative impact on archeological resources. The actions under alternative A would contribute a negligible increment to this cumulative impact.

Conclusion—**U**nder alternative A, impacts on archeological resources would be permanent, negligible, and adverse. Cumulative impacts would be permanent, minor, and adverse. The actions under alternative A would contribute a negligible increment to this cumulative impact.

Section 106 Summary—After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR part 800.5, *Assessment of Adverse Effects),* the National Park Service concludes that implementation of alternative A would have no adverse effect on archeological resources.

Museum Collections. Museum collections would be collocated with the collections of Fort Frederica and Ocmulgee national monuments in Macon, Georgia, thereby eliminating their vulnerability to storm surge and wind damage. Impacts to museum collections would be permanent and beneficial.

Cumulative Impacts—The National Park Service is currently endeavoring to move vulnerable museum collections in the Southeast away from coastal locations to more secure inland facilities. Impacts to museum collections would be permanent and beneficial. The actions under alternative A would contribute a significant increment to this cumulative impact.

Conclusion—Under alternative A, impacts on museum collections would be permanent and beneficial. Cumulative impacts would likewise be permanent and beneficial. The actions under alternative A would contribute a significant increment to this cumulative impact.

Section 106 Summary—After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR part 800.5, *Assessment of Adverse Effects),* the National Park Service concludes that implementation of alternative A would have no adverse effect on museum collections.

Historic Structures. Under alternative A, impacts on historic structures would continue to occur due to aging of the historic fabric, normal wear and tear, and vandalism. Impacts for the most part would be temporary, adverse, and of negligible intensity. Continued ranger patrols and cyclic maintenance activities would minimize damage to historic structures. Negative impacts would be anticipated to be short-term, negligible, and adverse. No historic structures would be modified or removed under this alternative.

Cumulative Impacts—No historic structures associated with Fort Pulaski survive in the immediate area surrounding the monument. However, in the local metropolitan and regional area, a number of historic structures survive, and losses to these resources continue to occur due to development projects and structural modification. Therefore, when the short-term, negligible to minor, and adverse effects of implementing alternative A are added to the moderate to major adverse effects of other past, present, and reasonably foreseeable actions as described previously, there would be long-term, moderate to major adverse cumulative impacts on historic structures. Alternative A would contribute a negligible increment to this cumulative impact.

Conclusion—Under alternative A, impacts on historic structures would be short term, negligible, and adverse, mostly due to normal wear and tear. Cumulative impacts would be moderate to major and adverse due to continued development in the local and regional area. The actions under alternative A would constitute a negligible increment to this cumulative impact.

Section 106 Summary—After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes that implementation of alternative A would have no adverse effect on historic structures.

Cultural Landscapes. Under alternative A, the cultural landscape of the monument would continue to differ from its historic appearance. Areas on Cockspur Island that were open fields or otherwise cleared during the Civil War would continue to be covered by invasive, nonnative vegetation. Sight lines between the fort and Union batteries would continue to be obscured. As a result, existing adverse impacts on the cultural landscape would continue. Some removal of nonnative vegetation could occur under this alternative through periodic employment of NPS nonnative plant management teams. Resulting impacts on the cultural landscape would be long term and beneficial. No impacts would occur from facility development because no new development is planned under this alternative.

Cumulative Impacts—Development continues on nearby Tybee Island, including areas where Union batteries were located during the war. On the other hand, efforts are ongoing to preserve the sites of historic batteries on Tybee and Long islands. On balance, impacts on the cultural landscape of the area surrounding the monument are long term, minor to moderate, and both beneficial and adverse. When the long-term and beneficial effects of implementing alternative A are added to the minor to moderate effects of other past, present, and reasonably foreseeable actions as described previously, there would be long-term, minor to moderate, beneficial and adverse cumulative impacts on the cultural

landscape. Alternative A would contribute a negligible to minor increment to this cumulative impact.

Conclusion—Under alternative A, there would be long-term beneficial impacts on the cultural landscape due to a gradual reduction in nonnative vegetation. Cumulative impacts would be long term, minor to moderate, and both beneficial and adverse. Alternative A would contribute a negligible to minor increment to this cumulative impact.

Section 106 Summary—After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes that implementation of alternative A would have no adverse effect on the cultural landscape.

Ethnographic Resources. Fort Pulaski National Monument has not yet been the subject of an ethnographic assessment and therefore the existence (or nonexistence) of ethnographic resources is undocumented. However, research by Dr. Charles J. Elmore (Elmore 2002) and other records demonstrate that there are traditional attachments and connections between the African American community in the Savannah area and Fort Pulaski National Monument. These connections include the use of slaves in the construction of the fort, General David Hunter's emancipation proclamation, the use of the fort as a stop on the Underground Railroad, and the use of the fort as a haven for freed and escaped slaves subsequent to the capture of Fort Pulaski by Union forces in April of 1862. In addition to these African American connections, the story of the "Immortal Six Hundred" resonates today among those whose ancestors fought on the side of the Confederacy and those who continue to do research on the subject of prisoners of war. Alternative A would have few if any impacts on the foregoing attachments because it would continue to provide long-term protection to the fort and its historic context. Impacts to ethnographic resources would therefore probably be negligible, long term, and neutral.

Cumulative Impacts—Development continues on nearby Tybee Island, including in areas that may have ethnographic resources similar to those within the monument. Actual impacts on ethnographic resources are not known. However, given the long-term protection of the fort and its historic context, alternative A would contribute a negligible increment to any cumulative impact that might occur.

Conclusion—Under alternative A, there would probably be negligible, long-term, and neutral impacts on ethnographic resources. Cumulative impacts are unknown. Alternative A would contribute a negligible increment to this cumulative impact.

Section 106 Summary—After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes that implementation of alternative A would have no adverse effect on ethnographic resources.

Natural Resources

Geology and Soils. Under alternative A, geological, physiographical, and soil resources would continue to be subject to current management practices and policies. Impacts to these resources would be due to soil erosion from existing roads and trails, shoreline erosion from ongoing shipping activities in the Savannah River, soil compaction at trailheads and parking areas, and soil disturbance resulting from miscellaneous facility maintenance activities. Impacts to soils and geologic resources would be negligible to minor, local, short and long term, direct, and adverse.

Cumulative Impacts—Permanent soil loss resulting from regional growth and development would adversely impact soils. The impact of these efforts on soils is expected to be long term, moderate to

major, and adverse. When the probable effects of implementing the actions under alternative A are added to the effects of other past, present, and reasonably foreseeable actions as described previously, there would be a long-term, moderate to major, adverse cumulative impact on soils. The actions under alternative A would contribute a negligible increment to this cumulative impact.

Conclusion—Under alternative A, impacts on soils and geologic resources would be long term, negligible to minor, adverse, and local. There would be a long-term, moderate to major, adverse cumulative impact on soils and geologic resources. The actions under alternative A would contribute a negligible increment to this cumulative impact.

Plant Communities and Vegetation. Vegetation resources would continue to be subject to current management practices and policies. Impacts would be due primarily to removal of dead, diseased, or hazardous trees, as well as fuel removal in accordance with the approved fire management plan. Additional impacts would occur from the possible continued spread of nonnative vegetation, as well as from trampling and other visitor use of existing facilities. Collectively, impacts from implementing alternative A would continue to be negligible to minor, adverse, long term, and local.

Cumulative Impacts—Regional growth and development is expected to result in an increase in the disturbance or destruction of plant communities and vegetation. The impact of these activities on vegetation and vegetative communities is expected to be long term, moderate to major, and adverse. When the probable effects of implementing the actions under alternative A are added to the effects of other past, present, and reasonably foreseeable actions as described previously, there would be a long-term, moderate to major, and adverse cumulative impact on plant communities and vegetation. The actions under alternative A would contribute a negligible increment to this cumulative impact.

Conclusion—Under alternative A, impacts on plant communities and vegetation would be long term, adverse, negligible to minor, and local. There could be long-term, moderate to major, and adverse cumulative impacts on vegetation and plant communities in the surrounding region. The actions under alternative A would contribute a negligible increment to this cumulative impact.

Exotic/Nonnative Plants. Nonnative plants can have severe effects on the integrity of native systems and habitats. Visitors can be agents for seed dispersal, increasing the threat to native plant communities. Under alternative A, impacts on monument resources from the growth and spread of exotic/nonnative plants would continue to occur. Some limited removal of nonnatives would take place as funding became available, but large scale restoration would not be likely to take place in the near term. Nonnative vegetation would therefore continue to displace native vegetation in large portions of Cockspur Island, with corresponding impacts on natural processes and native wildlife. Impacts from exotic/nonnative species would be long term, adverse, and moderate to major, and would be concentrated on Cockspur Island.

Cumulative Impacts—Regional growth and development 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. The impact of these activities on native plants and plant communities is expected to be long term, moderate to major, and adverse. When the probable effects of implementing the actions under alternative A are added to the effects of other past, present, and reasonably foreseeable actions as described previously, there would be a long-term, moderate to major, adverse cumulative impact on native natural processes resulting from the loss of vegetative cover and the spread of nonnative plants. The actions under alternative A would contribute a very small increment to this cumulative impact.

Conclusion—Under alternative A, impacts from nonnative plants and nonnative vegetation would be long term, adverse, and moderate to major, and would be concentrated on Cockspur Island. There could be long-term, moderate to major, adverse cumulative impacts on native natural processes. The actions under alternative A would contribute a very small increment to this cumulative impact.

Fish and Wildlife. Under alternative A, minor adverse impacts on fish and wildlife would continue to occur, primarily from disturbance to soils and vegetation caused by ongoing visitor use and NPS management activities. Some limited vegetation management efforts, including hazardous vegetation removal and limited management of nonnative vegetation, would improve habitat by decreasing competition from nonnative plants and increasing the availability of native plants as food sources. Impacts from these management activities would be long term and beneficial. Overall, impacts on fish and wildlife from the continuation of current management (alternative A) would be long term, minor, and both beneficial and adverse.

Cumulative Impacts—Regional growth and development is expected to continue and result in an increase in the conversion of natural lands to development in the general area. The loss of natural areas and the increasing urbanization of the region have led to a loss of wildlife habitat. Continued urbanization will fragment remaining natural areas and increase the risks and threats to wildlife, including automobile collisions, nonnative species, and pathogens. Rainwater runoff and industrial discharges from urban areas may lead to a deterioration of water quality, with corresponding impacts on fish species. Overall, the effects of the activities described previously would probably be long term, moderate, and adverse on fish and wildlife in the region. When the probable effects of implementing the actions under alternative A are added to the effects of other past, present, and reasonably foreseeable actions as described previously, there would be a long-term, moderate, adverse cumulative impact on fish and wildlife. The actions under alternative A would contribute a very small increment to this cumulative impact.

Conclusion—Under alternative A, impacts on fish and wildlife from the continuation of current management would be long term, minor, and both beneficial and adverse. Impacts would be concentrated at Cockspur Island. Minor adverse impacts on soil, water quality, and vegetation would result in minor adverse effects on some fish and wildlife species. In contrast, the removal of nonnatives would result in beneficial effects on some wildlife species. There would be long-term, moderate, adverse cumulative impacts on fish and wildlife. The actions under alternative A would contribute a very small increment to this cumulative impact.

Water Quality. Alternative A would result in impacts on hydrology and water quality that are negligible to minor, long term, indirect, and adverse. Impacts would be due to sedimentation from existing roads and trails, as well as from oil and grease discharges at parking areas and road crossings over waterways. Additional impacts could occur from the use of herbicides to control nonnative vegetation. To mitigate impacts from herbicide, the National Park Service would use the appropriate class of herbicide for the vegetation setting in question, would strictly adhere to application directions, and would use appropriate best management practices.

Cumulative Impacts—Regional growth and development is expected to result in an increase in the conversion of natural lands to development and alter the hydrology of the general area. Water quality would be affected by inputs from urban and suburban development, including increases in organic compounds and chemical concentrations. Inputs would derive both from point sources (e.g., sewer outfalls) and nonpoint sources (e.g., storm water runoff). The impact on water quality within the watershed is expected to be adverse, but the intensity is

unknown. When the probable effects of implementing the actions under alternative A are added to the effects of other past, present, and reasonably foreseeable actions as described previously, there would be a long-term, adverse cumulative impact on water quality in the watershed. The intensity of the impact is unknown. The actions under alternative A would contribute a very small increment to this cumulative impact.

Conclusion—Under alternative A, impacts on water quality would be long term, negligible to minor, adverse, and local. There would be a long-term, adverse cumulative impact on water quality in the watershed. The intensity of the impact is unknown. The actions under alternative A would contribute a very small adverse increment to this cumulative impact.

Floodplains. Under alternative A, existing structures in the 100-year floodplain would remain in place. Such structures include the historic fort, the visitor center, administrative structures, access roads and trails, visitor parking area, sidewalks and trails, etc. Impacts to floodplain functions would be negligible to minor. These structures will remain in place because they either constitute the resource that the monument was designated to protect, or they provide administrative or visitor services in the only practical locations available.

Cumulative Impacts—Regional growth and development is expected to affect floodplains in the region. Floodplains could be physically altered, changing their capacity and altering the natural course of floodwater flow. Natural flood patterns would be adversely affected, but any adverse impacts on property and life should be mitigated through proper permitting. The impact of the floodplain modification and structures in floodplains could be long term, minor to major (depending on the location and the nature of the impact), and adverse. When the probable effects of implementing the actions under alternative A are added to the effects of other past, present, and reasonably foreseeable actions as described previously, there would be a long-term, minor to major, adverse cumulative impact on floodplains. The actions under alternative A would contribute a very small increment to this cumulative impact.

Conclusion—Given that Cockspur Island rarely floods, impacts on floodplain functions under alternative A would be local, direct and indirect, negligible to minor, and adverse. Impacts to infrastructure in the event of flooding would be short and long term, moderate to major, and adverse.

Wetlands. No filling of wetlands or other reduction in wetland function or values would occur as a result of alternative A. Therefore, no new impacts on wetlands would occur under this alternative. Impacts on wetlands would be attributed primarily to the retention and maintenance of existing facilities, such as roads, grades, and trails. Impacts would include those from past vegetation loss and alteration of soils, which have resulted in permanent effects on wetland size and integrity that are long term, minor, adverse, and local. Indirect impacts, such as increased runoff and sedimentation, are and will continue to be long term, minor, adverse, and local. Collectively, impacts on wetlands under alternative A would continue to be long term, minor, adverse, and local.

Cumulative Impacts—Some reduction in wetland function or values inside the monument could take place as a result of actions occurring outside the monument boundary, e.g., expansion of U.S. Highway 80, and alteration of the Savannah River channel to accommodate more and larger ships. Short-term impacts on wetlands would be adverse, moderate, and local; long-term residual impacts would be adverse, minor, and local. Regional growth and development is expected to result in an increase in the conversion of natural lands to development and alter the hydrology of the general area. Changes in sheet flow and water quality would affect the size, integrity, and function of wetlands in the watershed. The impact of these activities on wetlands

would be long term, moderate to major, and adverse. The adverse impacts would be at least partially offset by wetlands mitigation required by permitting agencies. Overall, the effects of the projects discussed previously would be adverse on wetlands. When the probable effects of implementing the actions under alternative A are added to the effects of other past, present, and reasonably foreseeable actions as described previously, there would be a long-term, minor to major, adverse cumulative impact on wetlands. The actions under alternative A would not contribute any new impacts to this cumulative impact.

Conclusion—Under alternative A, past impacts on wetlands would continue and would be long term, minor, adverse, and local. There would be a long-term, minor to major, adverse cumulative impact on wetlands. The actions under alternative A would not contribute any new impacts on this cumulative impact.

Wilderness Resources and Values

In accordance with NPS *Management Polices 2006,* eligible land in the monument would continue to be managed to preserve its wilderness character and maintain its potential eligibility for wilderness designation; however, lands within the monument would not be proposed for wilderness designation and hence would not receive the special status and protection that derives from wilderness designation. Because of limited public use of the salt marsh portion of the monument, fragmentation of habitats would be minimized, and the current condition of the natural soundscape would continue to be preserved. Opportunities for solitude and primitive and unconfined recreation would continue to be preserved and available. Continuation of current management would result in long-term beneficial impacts on wilderness character. Fishing would be allowed but would be accommodated by boat-in access only. The minimal public use in the salt marsh portion of the monument would cause only negligible to minor adverse impacts on wilderness resources and values. Ongoing NPS resource management activities would continue to preserve the long-term naturalness and untrammeled quality of the eligible lands, but development outside the monument boundary could cause some short- and long-term adverse impacts on wilderness character, including degradation of the natural soundscape and diminished opportunities for solitude. Overall, the impacts on wilderness resources and values would continue to be long term, beneficial, and local.

Cumulative Impacts. Regional growth and development is expected to continue and result in an increase in the conversion of natural lands in the general area. Increasing urbanization, fragmentation of habitat, and the loss of natural areas have led to the degradation of natural resources, ecosystem function, and natural soundscapes in the region. The impact of these activities on wilderness resources and values is expected to be long term, moderate, and adverse. Overall, the effects of the projects discussed previously would probably be adverse to wilderness resources and values in the region. When the probable effects of implementing the actions under alternative A are added to the effects of other past, present, and reasonably foreseeable actions as described previously, there would be a long-term, minor to moderate, adverse cumulative impact on wilderness resources and values in the region. The actions under alternative A would not contribute to this cumulative impact.

Conclusion. Under alternative A, impacts on wilderness resources and values from the continuation of current management would be long term, beneficial, and local. There would be a long-term, minor to moderate, adverse cumulative impact on wilderness resources and values in the region. The actions under alternative A would not contribute to this cumulative impact.

Visitor Use and Experience

The no-action alternative would not change the current management of the monument. Visitors would continue to have access to the historic fort and lighthouse, and monument staff would continue to offer a variety of interpretive programs. Opportunities for hiking, biking, and picnicking would continue to be available. Overall, access to historic resources and the availability of varied recreational opportunities would result in long-term, beneficial impacts on visitor use and experience.

Cumulative Impacts. Regional growth is expected to result in increased development in the vicinity of the monument. As a result, opportunities for cultural tourism and recreational activities may expand at Tybee Island and in the Savannah metropolitan area. Because the monument is well-buffered by thousands of acres of salt marsh, these opportunities would expand the choices available to monument visitors without affecting the actual visitor experience of most people using the monument. Combining the probable effects of implementing the no-action alternative with the effects of other past, present, and reasonably foreseeable actions described previously, the cumulative impact on visitor use and experience in the monument would be long term and beneficial. The actions under the no-action alternative would not contribute an appreciable increment to this cumulative impact.

Conclusion. Under the no-action alternative, impacts on visitor use and experience would be long term, moderate, and neutral. The cumulative impact on visitor use and experience in the monument would be long term and beneficial. The actions under the no-action alternative would not contribute an appreciable increment to this cumulative impact.

Socioeconomic Environment

Analysis of economic impacts under alternative A was based on projected visitation to the monument as well as estimated one-time capital expenditures due to construction activities, if appropriate. Because alternative A would maintain the status quo, visitor spending is assumed to remain more or less as it is today, with some slight increase due to anticipated population growth in the local area.

Local Economy Employment. Because no new jobs would be created under alternative A, Chatham County would not realize any changes to its employment levels. As a result, long-term impacts resulting from alternative A would be local, negligible, and neutral. Furthermore, because there would be no new capital expenditures in the monument, short-term employment impacts would also remain unaffected, because there would be no need to hire labor for construction activity. Consequently, short-term impacts of alternative A would be local, negligible, and neutral.

Housing. Because alternative A would not entail hiring additional staff, demand for residential housing would remain unchanged. Short-term impacts resulting from alternative A would be local, negligible, and neutral.

Sales. Total sales of goods and services in Chatham County, as a result of visitor spending, would remain more or less unchanged under the no-action alternative. Because alternative A does not increase or decrease sales revenue, long-term impacts would be local, negligible, and neutral.

Cumulative Impacts. The action area for evaluating cumulative impacts on the socioeconomic environment is Chatham County. The implementation of alternative A does not have a strong likelihood of attracting new visitors and locals to the monument. Relatively steady visitation would translate into more or less unchanged spending in the area, resulting in neutral

impacts for Chatham County in terms of employment, housing, and taxable annual sales. However, long-term economic activity in the county appears likely to increase due to the continued long-term expansion of world shipping and the potential construction of new facilities at the Port of Savannah and the proposed port at Jasper County, South Carolina. A surge in retirees in coming years is expected to increase populations near the coast with concomitant impacts on construction, health care, and related industries. Combining the probable effects of implementing the no-action alternative with the effects of other past, present, and reasonably foreseeable actions described previously, the cumulative socioeconomic impacts would be local and beneficial. Alternative A would contribute a negligible increment to this cumulative impact.

Conclusion. Because there would be no changes to visitor spending or construction activity within Chatham County under alternative A, long-term and short-term impacts on the socioeconomic environment would be local, negligible, and neutral. As a result, county employment, housing, and sales would remain constant. In terms of cumulative impacts, long-term and short-term impacts would be local and beneficial. Alternative A would contribute a negligible increment to this total cumulative effect.

Monument Operations

Alternative A would maintain the status quo with respect to monument staff and facilities. Possible future boundary expansions adding new historical resources would impose additional long-term maintenance and interpretation responsibilities on monument staff. Current staff levels are generally adequate to protect existing monument resources and serve visitors. Thus, alternative A would result in minor, long-term, neutral impacts on NPS operations.

Cumulative Impacts. Cooperation and coordination with neighboring agencies and entities regarding planning, land use, resources, and development proposals near the monument would continue to require varying amounts of staff time and result in minor to moderate long-term adverse impacts. Combined with other past, present, and reasonably foreseeable future impacts, alternative A would result in minor to moderate, long-term, neutral cumulative impacts on NPS operations.

Conclusion. Operation of existing visitor and administrative facilities in the monument would result in continuing minor, long-term, neutral impacts on NPS operations. The cumulative impacts of the no-action alternative and other reasonably foreseeable future actions required of monument staff would be minor to moderate, long term, and neutral.

Energy Requirements and Conservation Potential

Under alternative A, no new facilities would be developed, thereby eliminating any new energy requirements for facility construction. Public use of the monument would remain at about its current level. The fuel and energy consumed by visitors traveling to the monument would not be likely to increase because visitation is not likely to increase substantially. Energy would still be consumed to maintain existing facilities and for resource management of the monument.

Unavoidable Adverse Impacts

Unavoidable adverse impacts are defined as impacts that cannot be fully mitigated or avoided. Adverse impacts on natural and cultural resources and visitor experience could occur in some areas throughout the monument, resulting from limited public use or NPS management activities.

Irretrievable or Irreversible Commitments of Resources

Under alternative A, the energy requirements identified previously would result in an irreversible commitment of resources. There would be no permanent effects on monument resources.

Relationship between Local Short-term Uses of the Environment and Maintenance or Enhancement of Long-term Productivity

In this alternative, most of the monument would be protected in a natural state and would maintain its long-term productivity. Only a small percentage of the monument would be maintained as developed areas.

IMPACTS OF IMPLEMENTING ALTERNATIVE B (NPS PREFERRED ALTERNATIVE)

Cultural Resources

Archeological Resources. Under this alternative, management of archeological resources would be similar to alternative A (continue current management). However, under alternative B, funding would also be sought for archeological studies to provide information about the construction village that was necessary to recreate part of the cultural landscape. Studies would be performed in such a way as not to constitute an adverse effect on a historic property. The proposed studies would improve archeological understanding of the site and expand the monument's museum collections.

On the other hand, the landscape restoration activities called for under this alternative (i.e., removing and replanting trees) could result in some soil disturbance and attendant impacts on archeological resources. Impacts are expected to be negligible because removed trees would be cut off at the ground surface rather than uprooted, and new plantings would be installed outside the historic core of the monument. Similar impacts on archeological resources could come from (a) removing the existing parking area and constructing a new one in a less conspicuous location, and (b) constructing a new visitor center annex on pilings above the 100-year floodplain in close proximity to the existing visitor center. (Before either of these projects could proceed, an archeological survey would need to be performed in the area of the proposed ground disturbance, followed by consultation with the Historic Preservation Division of the Georgia Department of Natural Resources.) Few if any impacts are expected to archeological resources from the latter projects because ground disturbance would take place in previously disturbed areas that consist primarily of dredge spoil.

Overall, impacts on archeological resources under this alternative, if any, could be greater than under alternative C because the landscape area to be restored under alternative B is larger and because impacts may result from moving the parking area and removing the old lot. Impacts on archeological resources under this alternative are anticipated to be local, permanent, negligible, and adverse.

Cumulative Impacts—Ongoing monument management and visitor use activities have resulted in relatively little disturbance of archeological resources in the monument. Large-scale projects such as deepening the Savannah River ship channel could pose some impacts on archeological resources in the vicinity of the monument. The number and extent of these archeological resources is unknown so the potential impact cannot be assessed with any degree of accuracy. However, the impacts of the federal channel project will be assessed in separate environmental compliance documents being prepared by the U.S. Army Corps of Engineers. When the long-term, direct and indirect, and beneficial effects of

implementing the actions under alternative B are added to the minor effects of other past, present, and reasonably foreseeable actions as described previously, there would be a permanent, negligible to minor, adverse cumulative impact on archeological resources. The actions under alternative B would contribute a negligible increment to this cumulative impact.

Conclusion—Under alternative B, impacts on archeological resources would be permanent, negligible, and adverse. Cumulative impacts would be permanent, minor, and adverse. The actions under alternative B would contribute a negligible increment to this cumulative impact.

Section 106 Summary—After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes that implementation of alternative B would have no adverse effect on archeological resources.

Museum Collections. Under this alternative, management of museum collections would be similar to alternative A (continue current management). However, under alternative B, funding would also be sought for archeological studies to provide information about the construction village that was necessary to recreate part of the cultural landscape. In addition, funding would be sought to prepare exhibits. The proposed studies would improve archeological understanding of the site and expand the monument's museum collections. Impacts to museum collections would be local, long term, and beneficial.

Cumulative Impacts—Generally the same as under alternative A, except that alternative B would also expand the monument's museum collections. The actions under alternative B would contribute a significant increment to this cumulative beneficial impact.

Conclusion—Under alternative B, impacts on museum collections would be permanent and beneficial. Cumulative impacts would likewise be permanent and beneficial. The actions under alternative B would contribute a significant increment to this cumulative impact.

Section 106 Summary—After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes that implementation of alternative B would have no adverse effect on museum collections.

Historic Structures. The impacts on historic structures under alternative B would be similar to those of alternative A (continue current management). However, under alternative B the parking lot in front of the historic fort would be moved to a new location outside the viewshed from the top of the fort. The former parking lot would then be removed and the area restored to the approximate landscape conditions existing during the principle period of significance. Impacts to the historic fort complex from this action would be local, long term, direct and beneficial. On the other hand, impacts on the historic parking area in the Mission 66 visitor center complex would be local, long term, direct, major, and adverse. Should alternative B become the selected action, the National Park Service would negotiate a memorandum of agreement with the Historic Preservation Division of the Georgia Department of Natural Resources to address this adverse effect, with appropriate mitigation measures.

As under alternative A, impacts on historic structures would continue to occur due to aging of the historic fabric, normal wear and tear, and vandalism. Impacts for the most part would be temporary, adverse, and of negligible intensity. Continued ranger patrols and cyclic maintenance activities would minimize damage to historic structures.

Overall, impacts on the historic fort area would be long term and beneficial, but these beneficial impacts would be partially offset by long-term major direct adverse impacts

on the parking area of the Mission 66 visitor center.

Cumulative Impacts—No historic structures associated with Fort Pulaski survive in the immediate area surrounding the monument. However, in the local metropolitan and regional area, a number of historic structures survive, and losses to these resources continue to occur due to development projects and structural modification. Therefore, when the local, long-term, beneficial and adverse effects of implementing alternative B are added to the moderate to major adverse effects of other past, present, and reasonably foreseeable actions as described previously, there would be long-term, moderate to major adverse cumulative impacts on historic structures. The actions under alternative B would contribute to these cumulative adverse impacts in a negligible to minor degree.

Conclusion—Under alternative B, impacts on historic structures would for the most part be local, long term, direct and indirect and beneficial due to partial restoration of the historic scene from the principal period of significance. However, relocating the parking area of the Mission 66 visitor center would result in long-term, direct, major, adverse impacts on a historic structure. In addition, some short-term, direct, negligible, and adverse impacts would occur to historic structures, mostly due to normal wear and tear. Cumulative impacts would be moderate to major and adverse due to continued development in the local and regional area. The actions under alternative B would contribute to these adverse cumulative impacts in a negligible to minor degree.

Section 106 Summary—After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR part 800.5, *Assessment of Adverse Effects),* the National Park Service concludes that implementation of alternative B would have an adverse effect on the Mission 66 visitor center complex. Should alternative B become the selected approach for managing the monument, the National Park Service would negotiate a memorandum of agreement with the Historic Preservation Division of the Georgia Department of Natural Resources to address this adverse effect, with appropriate mitigation measures.

Cultural Landscapes. Under alternative B, some of the existing adverse impacts on the cultural landscape would continue. However, this alternative would establish a large Historic Setting Zone, which would permit restoration of some cultural landscapes in accordance with the recommendations of the approved cultural landscape report. Of the two action alternatives, alternative B would have the greatest beneficial impacts on cultural landscapes because it would restore more site conditions and views to a condition approximating those in existence at the time of the Civil War. Periodic removal of nonnative vegetation would continue to occur under this alternative through periodic employment of NPS nonnative plant management teams. In addition, alternative B would move the parking lot from in front of the historic fort to a new location outside the viewshed from the top of the fort. The former parking lot would then be removed and the area restored to the approximate landscape conditions existing during the principle period of significance. Overall impacts on the cultural landscape due to site restoration would be local, long term, direct and indirect, and beneficial.

Although impacts on the cultural landscape from site restoration would be long term and beneficial, moving the parking lot and constructing the visitor center annex would have an adverse effect on an historic property. The adverse impacts would stem from (a) removing the parking lot from its original context adjacent to the Mission 66-era visitor center and moving it to a new location in the cultural landscape, and (b) constructing a visitor center annex adjacent to the Mission 66-era visitor center. Impacts to the cultural landscape from moving the parking area and constructing the annex would be local, permanent, direct, major, and adverse.

Should alternative B become the selected action, the National Park Service would negotiate a memorandum of agreement with the Historic Preservation Division of the Georgia Department of Natural Resources to address adverse effects with appropriate mitigation measures.

Cumulative Impacts—Development continues on nearby Tybee Island, including areas where Union batteries were located during the war. On the other hand, efforts are ongoing to preserve the sites of historic batteries on Tybee and Long islands. On balance, impacts on the cultural landscape of the area surrounding the monument are long term, minor to moderate, and both beneficial and adverse. When the long-term, moderate to major, beneficial and adverse effects of implementing alternative B are added to the minor to moderate effects of other past, present, and reasonably foreseeable actions as described previously, there would be long-term beneficial cumulative impacts on the cultural landscape. Alternative B would contribute a moderate increment to this cumulative impact.

Conclusion—Under alternative B, impacts on the cultural landscape would be long term, moderate to major, and both beneficial and adverse. Restoration of historic site conditions and views would result in an overall beneficial impact on the cultural landscape; however, movement of the visitor center parking lot from its original location would result in an adverse effect to a historic property. Construction of the visitor center annex would have an adverse effect on the cultural landscape. Cumulative impacts would be long term and beneficial. Alternative B would contribute a moderate increment to this cumulative impact.

Section 106 Summary—After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR part 800.5, *Assessment of Adverse Effects),* the National Park Service concludes that implementation of alternative B would have an adverse effect on the cultural landscape in the vicinity of the Mission 66 visitor center. Should alternative B become the selected approach for managing the monument, the National Park Service would negotiate a memorandum of agreement with the Historic Preservation Division of the Georgia Department of Natural Resources to address this adverse effect, with appropriate mitigation measures.

Ethnographic Resources. Impacts on ethnographic resources would be the same as under alternative A.

Cumulative Impacts—Development continues on nearby Tybee Island, including in areas that may have ethnographic resources similar to those within the monument. Actual impacts on ethnographic resources are not known. However, given the long-term protection of the fort and its historic context, alternative B would contribute a negligible increment to any cumulative impact that may be occurring.

Conclusion—Under alternative B, there would probably be negligible, long-term, and neutral impacts on ethnographic resources. Cumulative impacts are unknown. Alternative B would contribute a negligible increment to this cumulative impact.

FORT PULASKI SALLY PORT

Section 106 Summary—After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes that implementation

of alternative B would have no adverse effect on ethnographic resources.

Natural Resources

Geology and Soils. Impacts would include those from alternative A (continue current management). However, this alternative would establish a large Historic Setting Zone, which would permit restoration of historic site conditions and views in selected locations, in accordance with the approved cultural landscape report. Of the two action alternatives, alternative B would have the most adverse impacts on soils and geologic resources because it would remove the most vegetation and result in the most soil disturbance. Impacts to soils and geologic resources would be local, short and long term, direct, minor, and adverse. These impacts would be partially mitigated by use of best management practices during clearing. In addition to landscape rehabilitation, alternative B also calls for moving the parking lot from in front of the historic fort to a new location outside the viewshed of the top of the fort. The former parking lot would then be removed and the area restored to the approximate landscape conditions existing during the principle period of significance. Soils under the new parking area would be compacted and covered by paving material. Impacts to soils would be local, short and long term, moderate, and both beneficial and adverse.

Further impacts on soils would come from construction of a new visitor center annex. Impacts would stem from installation of piles for the new structure, as well as from soil compaction and disturbance by vehicles and heavy equipment in staging areas. Impacts would be local, short and long term, minor, and adverse. Overall impacts on soils and geologic resources from construction activities and the broader landscape rehabilitation described previously would be local, long term, direct, minor to moderate, and adverse. Impacts would be partially mitigated by use of best management practices during clearing and construction.

Cumulative Impacts—Permanent soil loss resulting from regional growth and development would adversely impact soils. The impact of these efforts on soils is expected to be long term, moderate to major, and adverse. When the local, short- and long-term, direct, minor, and adverse effects of implementing the actions under alternative B are added to the effects of other past, present, and reasonably foreseeable actions as described previously, there would be a long-term, moderate to major, adverse cumulative impact on soils. The actions under alternative B would contribute a very small increment to this cumulative impact.

Conclusion—Impacts to soils would stem largely from landscape rehabilitation efforts, together with additional impacts from moving the visitor parking lot and constructing a new visitor center annex. Soils under the old parking area would be restored as much as possible in order to recover a semblance of the historic scene. Soils under the new parking area would be compacted and covered by paving material. Soils in the vicinity of the new visitor center annex would be compacted and otherwise disturbed by construction activities. Overall impacts on soils would be local, long term, direct, minor to moderate, and adverse. Impacts would be partially mitigated by use of best management practices during clearing and construction. Cumulative impacts would be long term, moderate to major, and adverse. The actions under alternative B would contribute a very small increment to this cumulative impact.

Plant Communities and Vegetation. Impacts would include those from alternative A (continue current management). However, this alternative would establish a large Historic Setting Zone, which would permit restoration of historic site conditions and views in selected locations, in accordance with the approved cultural landscape report. Of the two action alternatives, alternative B would have the most adverse impacts on plant communities and vegetation because it would result in removal of the most vegetation.

Furthermore, alternative B calls for movement of the parking area to a new location, which would result in additional removal of existing vegetative cover. The latter impacts would be partially offset by revegetation of the old parking area. Additional impacts to vegetation would result from construction of a visitor center annex in close proximity to the existing visitor center. Vegetation, trees, and grasses would be removed from the site of the new structure and other vegetation would be disturbed by vehicles and heavy equipment in staging areas. Overall, impacts on plant communities and vegetation under alternative B would be local, short and long term, direct, minor, and adverse. These impacts would be beneficial to the extent the removed vegetation consisted of nonnative species. Impacts would be mitigated by new plantings outside the historic core of the monument.

Cumulative Impacts—Regional growth and development 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. The impact of these activities on native plants and plant communities is expected to be long term, moderate to major, and adverse. When the local, short- and long-term, direct, minor, and adverse effects of implementing the actions under alternative B are added to the effects of other past, present, and reasonably foreseeable actions as described previously, there would be a long-term, moderate to major, adverse cumulative impact on native natural processes resulting from the loss of vegetative cover and the spread of nonnative plants. The actions under alternative B would contribute a small increment to this adverse cumulative impact. The contribution would be marginally greater under this alternative than under alternative C due to the relocation of the parking area. On the other hand, it is possible that alternative B could offset adverse cumulative impacts to a negligible degree to the extent it results in the removal of nonnative vegetation.

Conclusion—Under alternative B, impacts on plant communities and vegetation would result primarily from landscape rehabilitation efforts, together with impacts from moving the visitor parking lot. Vegetation in the vicinity of the old parking area would be restored as much as possible in order to recover a semblance of the historic scene. Vegetation in the area of the new parking lot would be removed. Overall impacts on plant communities and vegetation would be local, long term, direct, minor to moderate, and adverse. Cumulative impacts would be long term, moderate to major, and adverse. The actions under alternative B would contribute a small increment to this adverse cumulative impact.

Exotic/Nonnative Plants. Under alternative B, impacts on monument resources from the growth and spread of exotic/nonnative plants would continue to occur. Some limited removal of nonnatives would take place as funding became available, but large scale restoration would not be likely to take place in the near term. Alternative B would establish a large Historic Setting Zone, which would permit restoration of historic site conditions and views in selected locations. Such restoration activities would produce corresponding reductions in nonnative vegetation. On the other hand, this alternative calls for construction of a new visitor center annex and the movement of the parking area to a new location. Both of these projects would result in disturbed ground in the project area and immediate vicinity. Disturbed ground frequently provides ideal generating sites for nonnatives. One aspect of site restoration in the area of the former parking area would entail control of nonnatives. Nevertheless, despite these and other efforts, nonnative vegetation would continue to displace native vegetation in large portions of Cockspur Island, resulting in adverse impacts on natural processes and native wildlife. On balance, impacts from nonnative vegetation would be local, short and long term, moderate to major, and adverse.

Cumulative Impacts—Regional growth and development 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. The impact of these activities on native plants and plant communities is expected to be long term, moderate to major, and adverse. When the long-term, moderate to major, and adverse effects of implementing the actions under alternative B are added to the effects of other past, present, and reasonably foreseeable actions as described previously, there would be a long-term, moderate to major, adverse cumulative impact on native natural processes resulting from the loss of vegetative cover and the spread of nonnative plants. Certain of the actions in alternative B (i.e., restoration of historic site conditions and views in selected locations) would offset these cumulative adverse impacts to a negligible degree.

Conclusion—Under alternative B, impacts from nonnative plants and nonnative vegetation would be long-term, adverse, and moderate to major, and would be concentrated on Cockspur Island. There could be long-term, moderate to major, adverse cumulative impacts on native natural processes. The actions under alternative B would both contribute to and offset these cumulative adverse impacts to a negligible degree.

Fish and Wildlife. Impacts would include those from alternative A (continue current management). However, this alternative would establish a large Historic Setting Zone, which would permit restoration of historic site conditions and views in selected locations. Of the two action alternatives, alternative B would have more adverse impacts on fish and wildlife because it would result in removal of the most vegetative cover, with corresponding direct and indirect impacts on fish and wildlife habitat. Adverse impacts on fish and wildlife would result from increased siltation in adjacent waterways and loss of habitat due to removal of plant cover. Impacts to wildlife would not be uniform, because the clearing of historic sight lines would benefit some species and hurt others. Moreover, impacts on wildlife would be beneficial to the extent that removed vegetation consisted of nonnative species. Alternative B would result in more adverse impacts on wildlife than alternative C because it calls for movement of the parking area to a new location, which would result in additional removal and modification of existing habitat. The latter impacts would be partially offset by revegetation of the old parking area. Impacts on wildlife from the new visitor center annex would be negligible because this facility would be built in an area that has marginal value as wildlife habitat. Overall, impacts on fish and wildlife under alternative B would be local, short and long term, direct and indirect, minor, and both beneficial and adverse. Adverse impacts would be mitigated by new plantings outside the historic core of the monument.

Cumulative Impacts—Regional growth and development is expected to continue and result in an increase in the conversion of natural lands to development in the general area. The loss of natural areas and the increasing urbanization of the region have led to a loss of wildlife habitat. Continued urbanization will fragment remaining natural areas and increase the risks and threats to wildlife, including automobile collisions, nonnative species, and pathogens. Rainwater runoff and industrial discharges from urban areas may lead to a deterioration of water quality, with corresponding impacts on fish species. Overall, the effects of the activities described previously would probably be long term, moderate, and adverse on fish and wildlife in the region. When the local, short- and long-term, direct, minor, and both beneficial and adverse effects of implementing the actions under alternative B are added to the effects of other past, present, and reasonably foreseeable actions as described previously, there would be a long-term, moderate, adverse cumulative impact on fish and wildlife. The actions under alternative B would contribute a very small increment to this cumulative impact.

Conclusion—Under alternative B, impacts on fish and wildlife would be local, short and long term, direct and indirect, minor, and both beneficial and adverse. Impacts would be concentrated at Cockspur Island and would result from restoration of historic site conditions and views in selected locations, as well as movement of the principal parking area to a new location. Minor adverse impacts on soil, water quality, and vegetation would result in minor adverse effects on some fish and wildlife species. In contrast, the removal of nonnatives would result in minor beneficial effects on some wildlife species. There would be long-term, moderate, adverse cumulative impacts on fish and wildlife. The actions under alternative B would contribute a very small increment to this cumulative impact.

Water Quality. Impacts would include those from alternative A (continue current management). However, this alternative would establish a large Historic Setting Zone, which would permit restoration of historic site conditions and views in selected locations. Of the two action alternatives, alternative B would have more adverse impacts on water quality because it would result in removal of the most vegetative cover, with corresponding direct and indirect impacts on water quality in adjacent water bodies. Adverse impacts on water quality would result from an increase in polluted runoff and from increased siltation in adjacent waterways. Adverse impacts would also result from construction of a new visitor center annex and from movement of the parking area to a new location. Both of these projects would cause additional soil disturbance and more potential for impacts on adjacent waters. The new education facility would also be served by a septic system, which potentially could adversely impact subsurface waters if not adequately maintained. Overall, impacts on water quality under alternative B would be local, short and long term, direct and indirect, minor, and adverse. Impacts would be partially mitigated by use of best management practices during clearing and site recovery.

Cumulative Impacts—Regional growth and development is expected to result in an increase in the conversion of natural lands to development and alter the hydrology of the general area. Water quality would be affected by inputs from urban and suburban development, including increases in organic compounds and chemical concentrations. Inputs would derive both from point sources (e.g., sewer outfalls) and nonpoint sources (e.g., storm water runoff). The impact on water quality within the watershed is expected to be adverse, but the intensity is unknown. When the local, short- and long-term, direct, minor, and adverse effects of implementing the actions under alternative B are added to the effects of other past, present, and reasonably foreseeable actions as described previously, there would be a long-term, adverse cumulative impact on water quality in the watershed. The intensity of the impact is unknown. The actions under alternative B would contribute a very small increment to this cumulative impact.

Conclusion—Under alternative B, impacts on water quality would be local, short and long term, direct and indirect, minor, and adverse. There would be a long-term, adverse cumulative impact on water quality in the watershed. The intensity of the impact is unknown. The actions under alternative B would contribute a very small increment to this cumulative impact. Impacts would be partially mitigated by use of best management practices during clearing and site recovery.

Floodplains. Impacts would be the same as those under alternative A, except that a new visitor center annex would be built in the 100-year floodplain. The structure would meet a compelling need for additional space to interpret the fort to the public, accommodate school groups, hold staff meetings, etc. There is no practicable alternative to building in the floodplain because all of Cockspur Island is in the 100-year floodplain. Impacts on both floodplain functions and infrastructure would be minimized by building the structure above the 100-year floodplain on piles. Impacts on

floodplain functions would be local, long term, direct and indirect, minor, and adverse. Impacts to infrastructure islandwide in the event of flooding would be short and long term, moderate to major, and adverse. For more information, see "Floodplain Statement of Findings" in appendix D.

Cumulative Impacts—Cumulative impacts would be the same as under alternative A. The actions under alternative B would contribute a small increment to this cumulative impact.

Conclusion—Given that Cockspur Island rarely floods, impacts on floodplain functions under alternative B would be local, direct and indirect, negligible to minor, and adverse. Impacts to infrastructure in the event of flooding would be short and long term, moderate to major, and adverse. Cumulative impacts would be long term, minor to major, and adverse. The actions under alternative B would contribute a small increment to this cumulative impact.

Wetlands. Impacts would generally be the same as those from alternative A (continue current management). The site of the new visitor parking area under alternative B would be in an area of former (pre-1847) wetlands. Some wetland areas may remain in this area, and others may have developed in subsequent years. Final siting of the parking area would be done in such a way as to avoid or minimize any wetland impacts. Such impacts, if they occur, are likely to be local, long term, negligible to moderate, and adverse.

Cumulative Impacts—Cumulative Impacts would be the same as under alternative A. The actions under alternative B would contribute a very small increment to this cumulative impact, if any.

Conclusion—Under alternative B, impacts on wetlands are likely to be local, long term, negligible to moderate, and adverse. There would be a long-term, minor to major, adverse cumulative impact on wetlands. The actions under alternative B would contribute a very small increment to this cumulative impact.

Wilderness Resources and Values

Alternative B proposes that approximately 4,500 acres of salt marsh within the monument boundary be designated as part of the national wilderness preservation system. Designation as wilderness would afford the highest level of protection available to federally managed public lands and allow permanent protection of the wilderness resource. Permanent protection would minimize or prevent fragmentation of habitat and would ensure that opportunities for solitude and primitive and unconfined recreation are available over the long term. Fishing would continue to be allowed but would be accommodated by boat-in access only. Under the terms proposed in alternative B, and assuming authorization of motorboat use by Congress, designation would not prevent use of motorboats in the main channels of the salt marsh because this is an established use of long duration.

Ongoing NPS resource management activities would continue to preserve the long-term naturalness and untrammeled quality of the eligible lands, but development outside the monument boundary could cause some short- and long-term adverse impacts on wilderness character, including degradation of the natural soundscape and diminished opportunities for solitude.

Cumulative Impacts. Regional growth and development is expected to continue and result in an increase in the conversion of natural lands in the general area. Increasing urbanization, fragmentation of habitat, and the loss of natural areas have led to the degradation of natural resources, ecosystem function, and natural soundscapes in the region. The impact of these activities on wilderness resources and values would be long term, moderate, and adverse. Alternative B would not prevent or alter these impacts, but would offset them

somewhat by granting most of the salt marsh in the monument permanent protection as wilderness.

Conclusion. Under alternative B, impacts on wilderness resources and values from the designation of wilderness would be long term, moderate to major, and beneficial. There would be a long-term, minor to moderate, adverse cumulative impact on wilderness resources and values in the region. The actions under alternative B would offset these impacts somewhat by granting most of the salt marsh in the monument permanent protection as wilderness.

Visitor Use and Experience

Impacts would generally be the same as alternative A, except that implementation of alternative B would remove vegetation to facilitate understanding of Fort Pulaski's field of fire and restore a portion of its historic sight lines. Alternative B calls for more site restoration than alternative C. The targeted clearing activities would provide visitors a greater understanding of the siege and reduction of Fort Pulaski in 1862. Some visitors would appreciate the enhanced historical perspective, while others would experience the removal of vegetative cover as a loss. Movement of the parking area to a new, less visible location would further enhance historic views from the fort. The area of the former parking area would be restored as much as possible to its historic appearance, thereby enhancing the experience of many visitors. A new visitor center annex would be constructed near the park's administration building, enhancing visitor understanding and enjoyment. No new recreational opportunities would be provided under this alternative. Overall, enhanced appreciation of the historic scene and continued availability of varied recreational opportunities would result in long-term beneficial impacts on visitor use and experience.

Cumulative Impacts. Regional growth is expected to result in increased development in the vicinity of the monument. As a result, opportunities for cultural tourism and recreational activities may expand at Tybee Island and in the Savannah metropolitan area. Because the monument is well-buffered by thousands of acres of salt marsh, these opportunities would expand the choices available to monument visitors without affecting the actual visitor experience of most people using the park. Combining the long-term, moderate, beneficial effects of implementing alternative B with the effects of other past, present, and reasonably foreseeable actions described previously, the cumulative impact on visitor use and experience in the monument would be long term and beneficial. The actions under alternative B would contribute substantially to this cumulative impact.

Conclusion. Impacts to visitor use and experience would stem primarily from targeted restoration of historic views and movement of the parking area to a less visible location. Impacts would be local, short and long term, moderate, and both beneficial and adverse, depending on a given visitor's individual preferences. Some visitors would appreciate the enhanced opportunity to experience historic views, while others would experience the removal of vegetative cover as a loss. Cumulative impacts would be long term and beneficial. The actions under alternative B would contribute a substantial increment to this cumulative impact.

Socioeconomic Environment

Under alternative B, visitation would be unlikely to increase to any appreciable degree over current levels, but might increase due to population growth. Impacts to the local economy from increased visitation-related spending would be long term, direct and indirect, and beneficial.

Local Economy Employment. No new permanent jobs would be created under

alternative B as no new permanent staff would be necessary to implement the alternative. As a result, Chatham County would not realize any long-term changes to its employment levels and long-term impacts resulting from alternative B would be local, negligible, and neutral. On the other hand, total one-time costs (facility and nonfacility) would be more than 7.5 times higher under alternative B than under alternative A, and slightly more than under alternative C. These new expenditures would result in additional short-term employment opportunities for local contractors and others. Consequently, short-term impacts of alternative B would be local and beneficial.

Housing. Because alternative B would not entail hiring additional permanent staff, demand for residential housing would remain unchanged. Short-term impacts resulting from alternative B would be local and neutral.

Sales. Under alternative B, total sales of goods and services in Chatham County, as a result of visitor spending, would probably increase a small amount over the life of this plan. Because alternative B would result in only a small increase in sales revenue, long-term impacts would be local and beneficial.

Cumulative Impacts. The action area for evaluating cumulative impacts on the socioeconomic environment is Chatham County. The implementation of alternative B would not have a strong likelihood of attracting significant numbers of new visitors and locals to the monument. Relatively steady to slightly increased visitation would translate into slightly increased spending in the area, resulting in small beneficial impacts for Chatham County in terms of employment, housing, and taxable annual sales. However, long-term economic activity in the county appears likely to increase due to the continued long-term expansion of world shipping and the potential construction of new facilities at the Port of Savannah and the proposed port at Jasper County, South Carolina. A surge in retirees in coming years is expected to increase populations near the coast with concomitant impacts on construction, health care, and related industries. Combining the probable effects of implementing alternative B with the effects of other past, present, and reasonably foreseeable actions described previously, the cumulative socioeconomic impacts would be local, moderate, and beneficial. Alternative B would contribute a negligible increment to this cumulative impact.

Conclusion. Because there would be only slight increases to visitor spending or monument expenditures within Chatham County under alternative B, long-term and short-term impacts on the socioeconomic environment would be local and slightly beneficial. As a result, county employment, housing, and sales would not be measurably affected. In terms of cumulative impacts, long-term and short-term impacts would be local and beneficial. Alternative B would contribute a negligible increment to this total cumulative effect.

Monument Operations

The impacts of alternative B on monument operations would include those of alternative A, plus the additional costs and effort needed to restore and maintain targeted historic views and operate and maintain the visitor center annex. The latter undertakings would impose additional long-term maintenance and interpretation responsibilities on monument staff. However, no addition of permanent staff would be necessary to implement alternative B. Thus, alternative B would result in minor, long-term, neutral impacts on NPS operations.

Cumulative Impacts. Same as under alternative A.

Conclusion. Operation of existing and projected visitor and administrative facilities in the monument would result in minor, long-term, neutral impacts on NPS operations. The cumulative impacts of

alternative B and other reasonably foreseeable future actions required of monument staff would be minor to moderate, long term, and neutral.

Energy Requirements and Conservation Potential

Under alternative B, one new facility would be developed, thereby adding a new long-term energy requirement for facility construction and maintenance. Construction and operation of the visitor center annex would be in accordance with NPS sustainability guidelines in order to minimize energy consumption. Some fuel would be consumed in the course of restoring historic sites and views and moving the parking area to a new location, but the amounts would be minor. Public use of the monument would remain at about its current level. The fuel and energy consumed by visitors traveling to the monument would not be likely to increase because visitation is not likely to increase substantially. Energy would still be consumed to maintain existing facilities and for resource management of the monument.

Unavoidable Adverse Impacts

Unavoidable adverse impacts are defined as impacts that cannot be fully mitigated or avoided. Adverse impacts on natural and cultural resources and visitor experience could occur in some areas throughout the monument, resulting from limited public use or NPS management activities.

Irretrievable or Irreversible Commitments of Resources

Under alternative B, the energy requirements identified previously would result in an irreversible commitment of resources. There would be no permanent effects on monument resources.

Relationship between Local Short-term Uses of the Environment and Maintenance or Enhancement of Long-term Productivity

In this alternative, most of the monument would be protected in a natural state and would maintain its long-term productivity. Only a small percentage of the monument would be maintained as developed areas.

IMPACTS OF IMPLEMENTING ALTERNATIVE C

Cultural Resources

Archeological Resources. Alternative C does not call for any changes in the management of archeological resources. Impacts to these resources would generally be the same as under alternative A. However, the landscape restoration activities called for under this alternative (i.e., removing and replanting trees) could result in some soil disturbance and attendant impacts on archeological resources. Impacts would be permanent, adverse, and of negligible intensity. The parking area would not be moved under this alternative and thus there would be no associated impacts on archeological resources. However, minimal (if any) impacts could also arise from constructing a visitor center annex on pilings in close proximity to the existing visitor center. Impacts from landscape restoration would be fewer under this alternative than under alternative B because less restoration would be called for under alternative C.

Cumulative Impacts—Same as alternative A. The actions under alternative C would contribute a negligible increment to this cumulative impact.

Conclusion—Under alternative C, impacts on archeological resources would be permanent, negligible, and adverse. Cumulative impacts would be permanent, minor, and adverse. The actions under

alternative C would contribute a negligible increment to this cumulative impact.

Section 106 Summary—After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes that implementation of alternative C would have no adverse effect on archeological resources.

Museum Collections. This alternative does not call for any changes in the management of museum collections. Impacts to these resources would be the same as under alternative A.

Cumulative Impacts—Same as alternative A. The actions under alternative C would contribute a significant increment to this beneficial cumulative impact.

Conclusion—Under alternative C, impacts on museum collections would be long term and beneficial. Cumulative impacts would likewise be long term and beneficial. The actions under alternative C would contribute a significant increment to this cumulative impact.

Section 106 Summary—After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR part 800.5, *Assessment of Adverse Effects),* the National Park Service concludes that implementation of alternative C would have no adverse effect on museum collections.

Historic Structures. The impacts on historic structures under alternative C would be similar to those of alternative A (continue current management). However, under alternative C, the Tybee Knoll Lighthouse oil shed would be stabilized and access would be provided to Cockspur Island Lighthouse. Impacts from these actions would be local, long term, direct and indirect, and beneficial. As under alternative A, impacts on historic structures would continue to occur due to aging of the historic fabric, normal wear and tear, and vandalism. Impacts for the most part would be temporary, adverse, and of negligible intensity. Continued ranger patrols and cyclic maintenance activities would minimize damage to historic structures. Adverse effects would be anticipated to be short term, negligible, and adverse.

Cumulative Impacts—No historic structures associated with Fort Pulaski survive in the immediate area surrounding the monument. However, in the local metropolitan and regional area, a number of historic structures survive, and losses to these resources continue to occur due to development projects and structural modification. As a result, when the local, long-term, moderate, and beneficial effects of implementing alternative C are added to the moderate to major adverse effects of other past, present, and reasonably foreseeable actions as described previously, there would be long-term, moderate to major adverse cumulative impacts on historic structures. The actions under alternative C would offset these cumulative adverse impacts to a negligible degree.

Conclusion—Under alternative C, impacts on historic structures would for the most part be local, long term, direct and indirect, and beneficial. Some short-term negligible to minor adverse impacts would occur, mostly due to normal wear and tear. Cumulative impacts would be moderate to major and adverse due to continued development in the local and regional area. The beneficial actions under alternative C would offset these cumulative adverse impacts to a negligible degree.

Section 106 Summary—After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes that implementation of alternative C would have no adverse effect to historic structures.

Cultural Landscapes. Under alternative C, some of the existing adverse impacts on the cultural landscape would continue. Like alternative B, this alternative would establish

a Historic Setting Zone that would permit restoration of some cultural landscapes in accordance with the approved cultural landscape report. However, there would be less restoration of cultural landscapes under this alternative than under alternative B. Beneficial impacts of restoring historic site conditions and views would be correspondingly less under this alternative than under alternative B. Impacts would be local, long term, direct and indirect, and beneficial. Periodic removal of nonnative vegetation would continue to occur under this alternative through periodic employment of NPS nonnative plant management teams. Impacts on the cultural landscape would be long term and beneficial.

On the other hand, adverse impacts would stem from constructing a visitor center annex near the existing Mission 66-era visitor center. Impacts to the cultural landscape from constructing the annex would be local, permanent, direct, major, and adverse. Should alternative C become the selected action, the National Park Service would negotiate a memorandum of agreement with the Historic Preservation Division of the Georgia Department of Natural Resources to address adverse effects with appropriate mitigation measures.

Cumulative Impacts—Cumulative impacts would generally be the same as under alternative B. The actions under alternative C would contribute a moderate increment to this cumulative impact.

Conclusion—Under alternative C, there would be long-term beneficial impacts on the cultural landscape due to restoration of historic site conditions and views, but there would also be long-term adverse impacts resulting from construction of the visitor center annex. Cumulative impacts would be long term, minor to moderate, and both beneficial and adverse. Alternative C would contribute a small beneficial increment to this cumulative impact.

Section 106 Summary—After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes that implementation of alternative C would have an adverse effect on the cultural landscape in the vicinity of the Mission 66-era visitor center. Should alternative C become the selected approach for managing the monument, the National Park Service would negotiate a memorandum of agreement with the Historic Preservation Division of the Georgia Department of Natural Resources to address this adverse effect, with appropriate mitigation measures.

Tammy Herrell, National Park Service

WORLD WAR II BATTERY

Ethnographic Resources. Impacts on ethnographic resources would be the same as under alternative A.

Cumulative Impacts—Development continues on nearby Tybee Island, including in areas that may have ethnographic resources similar to those within the monument. Actual impacts on ethnographic resources are not known. However, given the long-term protection of the fort and its historic context, alternative C would contribute a negligible increment to any cumulative impact that may be occurring.

Conclusion—Under alternative C, there would probably be negligible long-term neutral impacts on ethnographic resources. Cumulative impacts are unknown. Alternative C would contribute a negligible increment to this cumulative impact.

Section 106 Summary—After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes that implementation of alternative C would have no adverse effect on ethnographic resources.

Natural Resources

Geology and Soils. Impacts to soils and geologic resources would include those under alternative A (continue current management), together with additional impacts associated with limited restoration of historic site conditions and views. Some removal of vegetation would occur under alternative C to restore historic sight lines, but not as much as under alternative B. As a result, soil erosion from vista clearing would be less than under the latter alternative. On the other hand, alternative C would generate additional impacts on soils arising out of the construction of a visitor center annex and the construction and use of new trails and other recreational facilities not contemplated under alternative B. Overall, impacts on soils and geologic resources would be local, short and long term, minor, and adverse. Impacts would be partially mitigated by use of best management practices during clearing and construction.

Cumulative Impacts—Cumulative impacts would generally be the same as under alternative B. The actions under alternative C would contribute a negligible increment to this cumulative impact.

Conclusion—Impacts would include those from alternative A, together with additional erosion from construction and use of new trails and other recreational facilities. Additional impacts to soils would stem from construction of a visitor center annex. Some removal of vegetation would occur to restore historic sight lines, but not as much as under alternative B. Impacts to soils would be local, short and long term, minor, and adverse. There would be a long-term moderate to major adverse cumulative impact on soils and geologic resources. The actions under alternative C would contribute a negligible increment to this cumulative impact.

Plant Communities and Vegetation. Impacts to plant communities and vegetation would include those under alternative A (continue current management), together with additional impacts associated with limited restoration of historic site conditions and views. Some removal of vegetation would occur under alternative C to restore historic sight lines, but not as much as under alternative B. As a result, damage to plants and plant communities from vista clearing would be less than under the latter alternative. On the other hand, alternative C would generate additional impacts on plant communities and vegetation arising out of the construction of a visitor center annex and the construction and use of new trails and other recreational facilities not contemplated under the other alternatives. Overall, impacts on plants and plant communities would be local, short and long term, minor, and adverse. Beneficial impacts from the removal of nonnative vegetation would be correspondingly less than under alternative B. Overall impacts would be mitigated by new plantings outside the historic core of the monument.

Cumulative Impacts—Cumulative impacts would generally be the same as under alternative B. The actions under alternative C would contribute a very small increment to this adverse cumulative impact, and could even offset it to a negligible degree to the extent it results in the removal of nonnative vegetation.

Conclusion—Under alternative C, impacts on plant communities and vegetation would be local, short and long term, direct, minor, and adverse. There could be long-term moderate to major adverse cumulative impacts on vegetation and plant communities in the surrounding region. The actions under alternative C would contribute a very small increment to this cumulative impact.

Exotic/Nonnative Plants. Impacts from nonnative plants would generally be the same as under alternative B, except that a less extensive sightline restoration effort would mean less removal of nonnatives. In addition, this alternative calls for the construction of new recreational facilities, which would entail new ground disturbance. Disturbed ground frequently provides ideal generating sites for nonnatives; similarly, trails can act as vectors for nonnatives. For this reason, mitigation measures would be implemented to limit the establishment of additional nonnatives in the monument. Impacts would be, local, short and long term, moderate to major, and adverse.

Cumulative Impacts—Cumulative impacts would generally be the same as under alternative B.

Conclusion—Under alternative C, impacts from nonnative plants and nonnative vegetation would be long term, adverse, and moderate to major, and would be concentrated on Cockspur Island. There could be a long-term moderate to major adverse cumulative impact on native natural processes. The actions under alternative C would offset the cumulative adverse impact to a negligible degree.

Fish and Wildlife. Impacts to fish and wildlife would include those under alternative A (continue current management), together with additional impacts associated with limited restoration of historic site conditions and views. Some removal of vegetation would occur under alternative C to restore historic sight lines, but not as much as under alternative B. As a result, impacts on fish and wildlife from clearing would be less under alternative C than under alternative B. Adverse impacts on fish would result from a slight increase in polluted runoff from disturbed areas and from limited siltation of adjacent waterways. Wildlife would be affected by loss of habitat due to removal of plant cover. Impacts to wildlife would not be uniform, however, because the clearing of historic sight lines would benefit some species and hurt others. Moreover, impacts on wildlife would be beneficial to the extent that removed vegetation consisted of nonnative species. Besides impacts from vista clearing and site restoration, alternative C would generate additional impacts from the construction of a visitor center annex and the construction and use of new trails and other recreational facilities not contemplated under the other alternatives. On balance, impacts on fish and wildlife under this alternative would be local, short and long term, direct and indirect, minor, and both beneficial and adverse. Overall impacts would be mitigated by new plantings outside the historic core of the monument.

Cumulative Impacts—Cumulative impacts would generally be the same as under alternative B. The actions under alternative C would contribute a very small increment to this cumulative impact.

Conclusion—Under alternative C, impacts on fish and wildlife would be local, short and long term, direct and indirect, minor, and both beneficial and adverse. Impacts would be concentrated at Cockspur Island and would result primarily from restoration of historic site conditions and views in selected locations, as well as the construction of new recreational facilities. Minor adverse impacts on soil, water quality, and vegetation would result in minor adverse effects on some fish and wildlife species. In contrast, the removal of nonnatives would result in minor beneficial effects on some wildlife species. This alternative would result in long-term moderate adverse cumulative impacts on fish and wildlife. The actions under alternative C would contribute a very small increment to this cumulative impact.

Water Quality. Impacts to water quality would include those from alternative A, together with additional impacts associated with limited restoration of historic site conditions and views. Some short-term increase in runoff and sedimentation would result from the removal of vegetation to restore historic sight lines, but not as much as under alternative B. Besides impacts from vista clearing and site restoration, alternative

C would generate additional impacts from the construction of a visitor center annex and the construction and use of new trails and other recreational facilities not contemplated under the other alternatives. All told, there would be slightly more runoff and impacts on water quality under alternative C than under alternative A, but less than under alternative B. Impacts to hydrology and water quality would be local, short and long term, minor, and adverse. Impacts would be partially mitigated by use of best management practices during clearing and site recovery.

Cumulative Impacts—Cumulative impacts would generally be the same as under alternative B. The actions under alternative C would contribute a very small increment to this adverse cumulative impact.

Conclusion—Under alternative C, impacts on water quality would be local, short and long term, minor, and adverse. There would be a long-term adverse cumulative impact on water quality in the watershed. The intensity of the impact is unknown. The actions under alternative C would contribute a very small increment to this cumulative impact. Impacts would be partially mitigated by use of best management practices during clearing and site recovery.

Floodplains. Impacts would generally the same as under alternatives A and B. Some new trails and other recreational facilities would be constructed, with minimal additional impacts on floodplain functioning. Impacts to floodplain functions would be negligible to minor, local, direct and indirect, and adverse. Impacts to infrastructure in the event of flooding would be moderate to major, short and long term, and adverse.

Cumulative Impacts—Cumulative impacts would generally be the same as under alternative A. The actions under alternative C would contribute a very small increment to this adverse cumulative impact.

Conclusion—Given that Cockspur Island rarely floods, impacts on floodplain functions under alternative C would be local, direct and indirect, negligible to minor, and adverse. Impacts to infrastructure in the event of flooding would be short and long term, moderate to major, and adverse. Cumulative impacts would be long term, minor to major, and adverse. The actions under alternative C would contribute a very small increment to this adverse cumulative impact.

Wetlands. Impacts would be the same as those from alternative A (continue current management).

Cumulative Impacts—Cumulative Impacts would be the same as under alternative A.

Conclusion—Under alternative C, past impacts on wetlands would continue and would be long term, minor, adverse, and local. There would be a long-term minor to major adverse cumulative impact on wetlands. The actions under alternative A would not contribute any new impacts to this cumulative impact.

Wilderness Resources and Values

Analysis. Same as alternative B. As with alternative B, alternative C proposes that approximately 4,500 acres of salt marsh within the monument boundary be designated as part of the national wilderness preservation system. Designation under the terms proposed would guarantee permanent protection of the wilderness resource while allowing most current uses, including motor boating, to continue.

Cumulative Impacts. Same as alternative B.

Conclusion. Under alternative C, impacts on wilderness resources and values from the designation of wilderness would be long term, moderate to major, and beneficial. There would be a long-term minor to moderate adverse cumulative impact on wilderness resources and values in the

region. The actions under alternative C would offset these impacts somewhat by granting most of the salt marsh in the monument permanent protection as wilderness.

Visitor Use and Experience

Analysis. Because it calls for less clearing of historic sight lines than alternative B, alternative C would provide less historic perspective and information for visitors seeking an in-depth experience of the monument's cultural resources. On the other hand, some visitors would appreciate the greater amount of vegetative cover remaining under this alternative. Alternative C would also provide more new recreational opportunities than any of the other alternatives by authorizing an expanded trail system on Cockspur Island and expanding the launching facilities for canoes and kayaks at Lazaretto Creek. A visitor center annex would be constructed near the existing Mission 66-era visitor center, enhancing visitor understanding and enjoyment. Impacts to visitor use and experience would be moderate, local, short and long term, and both beneficial and adverse, depending on a given visitor's individual preferences.

Cumulative Impacts. Cumulative impacts would generally be the same as under alternative B. The actions under alternative C would contribute a substantial increment to this cumulative impact.

Conclusion. Impacts to visitor use and experience under alternative C would stem both from targeted restoration of historic views and authorization of additional recreational facilities. Impacts would be local, short and long term, moderate, and both beneficial and adverse, depending on a given visitor's individual preferences. Some visitors would appreciate the enhanced opportunity to experience historic views, while others would experience the removal of vegetative cover as a loss. Less clearing would take place under this alternative than under alternative B, and impacts on visitor use and experience would vary accordingly. The cumulative impact on visitor use and experience in the monument would be long term and beneficial. The actions under alternative C would contribute a substantial increment to this cumulative impact.

Socioeconomic Environment

As under alternative B, visitation under alternative C would be unlikely to increase to any appreciable degree over current levels, but might increase due to population growth. Impacts to the local economy from increased visitation-related spending would be long term, direct and indirect, and beneficial.

Local Economy Employment. No new permanent jobs would be created under alternative C as no new permanent staff is deemed necessary to implement the alternative. As a result, Chatham County would not realize any long-term changes to its employment levels and long-term impacts resulting from alternative C would be local, negligible, and neutral. On the other hand, total one-time costs (facility and nonfacility) would be more than seven times higher under alternative C than under alternative A, but less than under alternative B. These new expenditures would result in additional short-term employment opportunities for local contractors and others. Consequently, short-term impacts of alternative C would be local and beneficial.

Housing. Because alternative C would not entail hiring additional permanent staff, demand for residential housing would remain unchanged. Short-term impacts resulting from alternative C would be local, negligible, and neutral.

Sales. Under alternative C, total sales of goods and services in Chatham County, as a result of visitor spending, would probably increase a small amount over the life of this plan. Because alternative C would result in only a small increase in sales revenue, long-

term impacts would be local and slightly beneficial.

Cumulative Impacts. Same as alternative B. Alternative C would contribute a negligible increment to this cumulative impact.

Conclusion. Because there would be only slight increases to visitor spending or monument expenditures within Chatham County under alternative C, long-term and short-term impacts on the socioeconomic environment would be local and slightly beneficial. As a result, county employment, housing, and sales would not be measurably affected. In terms of cumulative impacts, long-term and short-term impacts would be local and beneficial. Alternative C would contribute a negligible increment to this total cumulative effect.

Monument Operations

The impacts of alternative C to monument operations would include those of alternative A, plus the additional costs and effort needed to restore and maintain targeted historic views and operate and maintain the new visitor center annex. The latter undertakings would impose additional long-term maintenance and interpretation responsibilities on monument staff. However, because alternative C calls for a less extensive landscape restoration than alternative B, it would have correspondingly less impact on monument operations. No addition of permanent staff would be necessary to implement alternative B. Thus, alternative B would result in minor long-term neutral impacts on NPS operations.

Cumulative Impacts. Same as alternative A.

Conclusion. Operation of existing and projected visitor and administrative facilities in the monument would result in minor long-term neutral impacts on NPS operations. The cumulative impacts of alternative C and other reasonably foreseeable future actions required of monument staff would be minor to moderate, long term, and neutral.

Energy Requirements and Conservation Potential

Under alternative C, no major new facilities would be developed, thereby eliminating any new long-term energy requirements for facility construction and maintenance. Some fuel would be consumed in the course of restoring historic sites and views and installing new recreational facilities, but the amounts would be minor. Public use of the monument would remain at about its current level. The fuel and energy consumed by visitors traveling to the monument would not be likely to increase because visitation is not likely to increase substantially. Energy would still be consumed to maintain existing facilities and for resource management of the monument.

Unavoidable Adverse Impacts

Unavoidable adverse impacts are defined as impacts that cannot be fully mitigated or avoided. Adverse impacts on natural and cultural resources and visitor experience could occur in some areas throughout the monument, resulting from limited public use or NPS management activities.

Irretrievable or Irreversible Commitments of Resources

Under alternative C, the energy requirements identified previously would result in an irreversible commitment of resources. There would be no permanent effects on monument resources.

Relationship Between Local Short-term Uses of the Environment and Maintenance or Enhancement of Long-term Productivity

In this alternative, most of the monument would be protected in a natural state and would maintain its long-term productivity. Only a small percentage of the monument would be maintained as developed areas.

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CONSULTATION AND COORDINATION

CHAPTER 5: CONSULTATION AND COORDINATION

BRIEF HISTORY OF PUBLIC INVOLVEMENT

The *General Management Plan / Wilderness Study / Environmental Impact Statement* for Fort Pulaski National Monument represents thoughts of the NPS monument staff, state and local agencies and organizations, and the public. Consultation and coordination among the agencies and the public were vitally important throughout the planning process. Public meetings and newsletters were used to keep the public informed and involved in the planning process for Fort Pulaski. A mailing list was compiled that consisted of members of governmental agencies, organizations, businesses, legislators, local governments, and interested citizens.

Initial scoping began in May 2003. Scoping is an early and open process for determining the scope of a proposed action or project and for identifying issues related to the project. During scoping, NPS staff provides an overview of the project, including purpose and need and preliminary issues. State and local agencies, private organizations and individuals, and the general public are asked to submit comments, concerns, and suggestions relating to the project and preliminary issues.

On May 21, 2003, the planning team met with the Georgia Department of Transportation in connection with the proposed widening and elevation of U.S. Highway 80, which runs through the national monument. The planning team also met with staff from the Historic Preservation Division of the Georgia Department of Natural Resources to discover any concerns or issues the team should consider in the planning process.

Additional monument staff and agency scoping meetings were conducted at the monument in June 2003. The participants included

- Georgia Department of Natural Resources, Coastal Resources Division
- U.S. Army Corps of Engineers
- U.S. Coast Guard
- U.S. Fish and Wildlife Service

The first general management plan newsletter was mailed in November 2003 with a postage-paid response card provided for recipients to express their opinions and suggestions for the future management of Fort Pulaski. Subsequent public scoping meetings and multiple party stakeholder meetings were conducted at the monument and in various venues between Savannah and Tybee Island in December 2003.

Participants in these meetings represented

- Savannah State University
- Georgia Historical Society
- Savannah Pilots Association
- Tybee Island City Council
- Coastal Georgia Regional Development Council
- Savannah/Chatham County Police Department
- Tybee Island Historic Society
- Chatham County Public Works & Parks Department
- Oatland Island Educational Center
- Georgia Land Trust
- Metropolitan Planning Commission
- National Park Service, Denver Service Center, Curatorial Services

The previously described organizations additionally represent, individually and collectively, the African American community, Civil War enthusiasts, descendants of Civil War era escaped slaves and prisoners of war, and other groups.

Newsletter 2 was issued in the spring of 2004 to report the findings of the scoping process to the public. Those findings are discussed in detail in chapter 1. A notice of intent to prepare the general management plan / environmental impact statement was published in the *Federal Register* on February 24, 2005. Another notice of intent was published in the *Federal Register* on July 2, 2007. This notice expanded the scope of the general management plan / environmental impact statement to include a wilderness study to determine if any portions of the national monument should be recommended for inclusion in the national wilderness preservation system as defined in the Wilderness Act of 1964.

Newsletter 3 was published in May 2007 and contained preliminary alternatives for the public to review and critique. Subsequently, between May 22 and May 23, 2007, four public open house meetings were held in the Savannah area (two meetings in the monument, one meeting at the Tybee Island City Hall, and one meeting at the Savannah Civic Center) to provide direct opportunities for the public to hear descriptions of and to comment on the proposed alternatives.

RELEASE OF THE DRAFT GENERAL MANAGEMENT PLAN / WILDERNESS STUDY / ENVIRONMENTAL IMPACT STATEMENT

The *Fort Pulaski National Monument Draft General Management Plan / Wilderness Study / Environmental Impact Statement* was released to the public on May 11, 2012. Two public meetings were held near Fort Pulaski to review and discuss the draft plan and receive public input.

- June 13, 2012, Tybee Island YMCA Complex, Tybee Island, Georgia
- June 14, 2012, Savannah Civic Center, Savannah, Georgia

The public comment period closed on July 9, 2012.

Approximately nine individuals, organizations, and agencies submitted correspondence about the draft plan. This correspondence came in the form of hardcopy letters and emails. A total of 29 individual comments were derived from the correspondence received.

All comment letters received from agencies and organizations are posted to the NPS's internet-based Planning, Environment, and Public Comment (PEPC) system (http://parkplanning.nps.gov/fopu) for public inspection.

A report titled "Comments and Responses on the Fort Pulaski National Monument Draft General Management Plan / Wilderness Study / Environmental Impact Statement" is included at the end of this chapter. The report summarizes the substance of the comments received during this draft review period and provides a collection of NPS responses to the various concerns that were raised.

CONSULTATIONS WITH OTHER AGENCIES AND ORGANIZATIONS

U.S. Fish and Wildlife Service, Section 7 Consultation

During the preparation of this document, NPS staff has coordinated informally with the U.S. Fish and Wildlife Service, Savannah Coastal Refuge Complex Office. The Fish and Wildlife Service provided a list of federal threatened and endangered species that might be in or near the national monument (appendix C).

In accordance with the Endangered Species Act and relevant regulations at 50 CFR 402, the National Park Service determined that the management plan is not likely to adversely affect any federally threatened or endangered species and sent a copy of the draft management plan to the U.S. Fish and Wildlife

Service office with a request for written concurrence with that determination. In addition, the National Park Service has committed to consult on future actions conducted under the framework described in this management plan to ensure that such actions are not likely to adversely affect threatened or endangered species.

Historic Preservation Division of the Georgia Department of Natural Resources, Section 106 Consultation

Agencies that have direct or indirect jurisdiction over historic properties are required by section 106 of the National Historic Preservation Act of 1966, as amended (16 USC 470, et seq.), to take into account the effect of any undertaking on properties eligible for listing in the National Register of Historic Places. In addition to the informal meeting with staff from the Georgia Historic Preservation Division cited earlier, the planning team sent the Historic Preservation Division a copy of newsletter number 1 in November of 2003 and newsletter number 2 in the spring of 2004. Informal consultation with other parties regarding cultural resource issues took place in the context of the meetings described previously in this chapter. Nine federally recognized American Indian tribal organizations were formally invited to consult on the general management plan. They were

- Alabama-Quassarte Tribal Town
- Catawba Indian Nation
- Chickasaw Nation
- Kialegee Tribal Town
- Muscogee (Creek) Nation
- Poarch Band of Creek Indians of Alabama
- Seminole Nation of Oklahoma
- Seminole Tribe of Florida
- Thlopthlocco Tribal Town

No tribal or local government representative or any other interested party expressed an interest in consulting on this plan pursuant to 36 CFR 800.2.

Under the terms of the 2008 programmatic agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers, "all undertakings that do not qualify for streamlined review [e.g., preparation of general management plans] … will be reviewed in accordance with 36 CFR Part 800." Therefore, the draft general management plan / wilderness study / environmental impact statement was submitted to the Historic Preservation Division of the Georgia Department of Natural Resources for review and comment.

List of Reviewing Agencies and Recipients

Federal Agencies
Advisory Council on Historic Preservation
U.S. Department of Defense
  Army Corps of Engineers
  Coast Guard
U.S. Department of the Interior
  National Park Service
  U.S. Fish and Wildlife Service
U.S. Environmental Protection Agency

American Indian Tribal Governments
Alabama-Quassarte Tribal Town
Catawba Indian Nation
Chickasaw Nation
Kialegee Tribal Town
Muscogee (Creek) Nation
Poarch Band of Creek Indians of Alabama
Seminole Nation of Oklahoma
Seminole Tribe of Florida
Thlopthlocco Tribal Town

U.S. Senators and Representatives
Honorable Johnny Isakson, Senator
Honorable Saxby Chambliss, Senator
Honorable Jack Kingston, House of Representatives

State Officials, Senators, and Representatives
Honorable Sonny Perdue, Governor
State Senator Earl "Buddy" Carter (District 1)
State Senator Lester G. Jackson (District 2)
State Representative Ann Purcell (Chatham District 159)
State Representative Bob Bryant (Chatham District 160)
State Representative Mickey Stephens (Chatham District 161)
State Representative J. Craig Gordon (Chatham District 162)
State Representative Burke Day (Chatham District 163)

State Agencies and Commissions
Historic Preservation Division of the Georgia Department of Natural Resources

Regional, County, and Local Governments
Savannah
Tybee Island
Chatham County
Coastal Georgia Regional Commission

Organizations, Businesses, and Universities
Savannah College of Art and Design
Savannah State University
Armstrong Atlantic State University
Tybee Island Historic Society
Georgia Historical Society
National Parks and Conservation Association
Civil War Preservation Trust

Libraries
Tybee Island Branch Library, Tybee Island
Islands Branch Library, Wilmington Island
Bull Street Library, Savannah

Television Stations
WSAV Television
WJCL Television
WTOC Television

Newspapers
Savannah Tribune
Savannah Morning News
Savannah Herald

COMMENTS AND RESPONSES ON THE FORT PULASKI NATIONAL MONUMENT DRAFT GENERAL MANAGEMENT PLAN / WILDERNESS STUDY / ENVIRONMENTAL IMPACT STATEMENT

This section summarizes the comments received following the release of the Fort Pulaski National Monument draft general management plan / wilderness study / environmental impact statement on May 5, 2012. All written comments were considered during the preparation of the final general management plan, wilderness study, and environmental impact statement in accordance with the requirements of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (40 CFR 1503). The comments allow the planning team, NPS decision-makers, and other interested parties to review and assess the views of other agencies, organizations, and individuals related to the preferred alternative, the other alternatives, and potential impacts.

All comments received during the public review and comment period have been duly considered and will remain in the project administrative record. The administrative record (or project file) documents the NPS decision-making process and records the basis and rationale for making the decision.

Methodology

Fort Pulaski National Monument received nine pieces of correspondence during the public review and comment period from May 5, 2012, through July 14, 2012.

Correspondence was received by one of the following methods: e-mail, hard copy letter via mail, or entered directly into the PEPC system. Each of these letters or submissions is referred to as correspondence. Each item of correspondence was read and specific comments within each correspondence were

identified. A total of 29 comments were derived from the correspondence received.

Because the number of comments was relatively small, there was no need to categorize or code them. All the comments received were, however, classified as substantive. A substantive comment is defined in the NPS *Director's Order 12 (DO-12) Handbook* as one that does one or more of the following (DO-12, section 4.6A):

- question, with a reasonable basis, the accuracy of information presented in the EIS
- question, with reasonable basis, the adequacy of the environmental analysis
- present reasonable alternatives other than those presented in the EIS and/or
- cause changes or revisions in the proposal

As further stated in Director's Order 12, substantive comments "raise, debate, or question a point of fact or policy. Comments in favor of or against the proposed action or alternatives, or comments that only agree or disagree with NPS policy, are not considered substantive." In addition, these comments were addressed in a variety of ways in the agency responses to comments in table 14, which follows on the next page.

TABLE 14. RESPONSES TO PUBLIC COMMENTS

Fort Pulaski National Monument Draft GMP/EIS – Responses to Public Comments		
Comment	**Response to Comment**	**Location of Response**
AGENCY COMMENTS		
U.S. Environmental Protection Agency:		
• The DEIS discusses the NPS's efforts to comply with the Endangered Species Act and section 106 of the National Historic Preservation Act. According to the DEIS, the NPS has informally coordinated with the U.S. Fish and Wildlife Service on threatened and endangered species and the Georgia Historic Preservation Division on historic properties. While the NPS describes various coordination efforts, the FEIS should document resource agency formal consultations including concurrence with the NPS's determination that the proposed project is not likely to adversely affect any federally threatened or endangered species and section 106 determinations regarding the relocation of the parking area for the Mission 66 visitor center.	The National Park Service has received correspondence from the Georgia State Historic Preservation Office acknowledging early coordination under the National Historic Preservation Act and our commitment to provide section 6 documentation on any projects emanating from the general management plan that may affect cultural resources. The National Park Service has also received correspondence (letter dated October 12, 2012) from the U.S. Fish and Wildlife Service concurring with our conclusion that no endangered or threatened species would be adversely affected by any elements of the approved plan.	N/A
• The NPS conducted a wilderness study for Fort Pulaski related to lands that were previously found eligible for wilderness designation. Based on a wilderness eligibility assessment, approximately 4,500 acres of tidal salt marsh at McQueen's island was found eligible. Both action alternatives propose the same amount of acreage for designation as part of the national wilderness preservation system. The USEPA supports the preservation and restoration of the salt marsh areas at Fort Pulaski as proposed by the NPS. This designation would help to preserve and protect the natural state of the salt marsh, and provide for "compatible recreational opportunities, education, and scientific study."	Noted.	N/A
U.S. Fish and Wildlife Service:		
• The National Park Service has determined that any actions under these Alternatives (A, B, or C) "are not likely to adversely affect any federally threatened or endangered species." We concur with your determination based solely on the actions of alternative B. In view of this, we believe that the requirements of section 7 of the ESA have been satisfied. However, obligations under section 7 of the ESA must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner which was not previously considered in this assessment; or (3) a new species is listed or critical habitat determined that may be affected by the identified action.	Prior to implementation of any action that is part of the final general management plan, the National Park Service will initiate and complete the appropriate level of compliance with NEPA, section 7 of the Endangered Species Act, and National Historic Preservation Act. Language to this effect has been added to the "Mitigative Measures Common to All Action Alternatives" section of Chapter 2 which follows the section on "Development of Cost Estimates."	Chapter 2, page 84, line 19
Georgia Historic Preservation Division:		
• Based on the information provided in the GNP (sic) and EIS, it appears that both alternatives B (NPS' preferred alternative) and C have the potential to affect historic and archaeological properties as they are implemented. We look forward to receiving section 106 documentation for properties as part of the implementation of the GNP (sic).	The National Park Service will comply with the requirements of the National Historic Preservation Act, including sections 106 and 110 prior to implementing any action with the potential to affect historic, archeological, or ethnographic resources.	N/A

TABLE 14. RESPONSES TO PUBLIC COMMENTS

Fort Pulaski National Monument Draft GMP/EIS – Responses to Public Comments		
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Georgia Coastal Resources Division		
• The Plan states that the management of populations of nonnative plant and animal species, up to and including eradication, would be undertaken wherever such species threaten monument resources or public health and when control is prudent and feasible. We encourage you to take a proactive stance on nonnative species control by reporting occurrences of invasive species to the Early Detection and Distribution Mapping System (www.eddmaps.com) developed by the Center for Invasive Species and Ecosystem Health at the University of Georgia.	Fort Pulaski National Monument conducts nonnative species management activities and programs in accord with the NPS *Management Polices 2006* directives and Executive Order 13112, "Invasive Species" (President William J. Clinton), February 3, 1999. The national monument actively manages and documents nonnative species through an internal monument natural resources program and with assistance from the Southeast Coast Exotic Plant Management Team (SEC-EPMT) and the Southeast Coast Network Inventory and Monitoring Program (SECN I&M). Fort Pulaski National Monument sets goals (Government Performance and Results Act [GPRA]) in a cyclic plan and reports on these goals every fiscal year through the Performance Management Data System (PMDS) for the treatment of nonnative and invasive plants. The main nonnative species populations currently being managed through eradication treatments are lantana (*Lantana camera),* Chinaberry (*Melia azedarach)*, Chinese tallow (*Triadica sebifera*), and Japanese honeysuckle (*Lonicera japonica).* Past treatments also included Chinese privet (*Ligustrum sinese)* and crapemyrtle (*Lagerstroemia indica)*. Presently, the majority of the treatment of monument nonnative species is a result of annual or bi-annual treatment trips by the SEC-EPMT. In fiscal year 2012, the SEC-EPMT treated 21.523 gross infested acres of 64.05 acres inventoried. The three main species treated during fiscal year 2012 were lantana (*Lantana camera),* Chinaberry (*Melia azedarach)*, and Chinese tallow (*Triadica sebifera*). The monument staff will consider reporting occurrences of invasive species to the Early Detection and Distribution Mapping System developed by the Center for Invasive Species and Ecosystem Health at the University of Georgia. Fort Pulaski National Monument understands that early detection and rapid response are crucial in keeping nonnative species from displacing our natural resources and/or natural processes, impacting our cultural resources and landscapes, etc. Additional clarifying language has been added to the text to make the above points.	Chapter 2, Actions Common to All Alternatives, page 57, after line 58

TABLE 14. RESPONSES TO PUBLIC COMMENTS

Fort Pulaski National Monument Draft GMP/EIS – Responses to Public Comments		
Comment	**Response to Comment**	**Location of Response**
• The Program concurs with your consistency determination. This determination ensures that the proposed project has been designed to comply to the maximum extent practicable with the applicable enforceable policies of the Georgia Coastal Management Program.	Noted.	N/A
COMMENTS FROM LOCAL GOVERNMENTS		
Chatham County – Savannah Metropolitan Planning Commission:		
• The Coastal Region Metropolitan Planning Organization (CORE MPO), a federally mandated transportation planning board staffed by the Chatham County - Savannah Metropolitan Planning Commission (MPC), wishes to ensure that US 80, as a crucial land connection, continues to provide adequate and safe access to and from Tybee Island, Our comments on the transportation aspects of your proposal are as follows:		
• In the interest of corridor preservation for US 80, CORE MPO recommends that the Wilderness Area boundary, in sections parallel to US 80, be 50 feet off of the edge of the current US 80 right-of-way. A distance of 50 feet off of right-of-way was described in an earlier draft of the Wilderness Area Study. This boundary description is preferable to the current description (100 feet off of the current centerline) for the reasons stated below. • The distance of 100 feet off of the current centerline does not allow enough flexibility for potential adjustments to alignments in future transportation projects, especially since bridge widenings or replacements almost always occur more to one side of an existing bridge than the other, and; • In one area, west of Bull River Bridge, the current boundary description would result in the inclusion of a segment of Old US 80lTybee Road, and thus pal1 of current, public right-of-way, within the Wilderness Area. All existing right-of-way should be preserved for future transportation projects, and not included in the Wilderness Area.	Language has been added to several sections that removes lands within 100 feet of the edge of the right-of-way of U.S. Highway 80 from the proposed wilderness designation.	Page 47, lines 8–9; Page 63, lines 56–57 and lines 72–74
• The Wilderness Area boundary should allow for the possibility of some additional land acquisition, and temporary use of land during construction, in future US 80 projects, as the roadway is a vital land connection.	The reduced wilderness boundary described in the NPS response to the CORE MPO comments provides for the possibility of additional land acquisition and temporary use during construction referred to in this comment. However, it should be noted that no land that is currently within NPS ownership at Fort Pulaski can be acquired by the State of Georgia, any local governmental entity, or any private individual without an act of Congress expressly authorizing such an acquisition.	See page references to previous comment.

TABLE 14. RESPONSES TO PUBLIC COMMENTS

Fort Pulaski National Monument Draft GMP/EIS – Responses to Public Comments		
Comment	**Response to Comment**	**Location of Response**
• Descriptions of US 80 transportation projects, in several sections of the General Management Plan (GMP), should be updated to reflect awareness of a newer project coming out of our US 80 Bridges Replacement Study. The US 80 Bridges and Road Improvements (PI #0010560) is funded in the MPO's 2035 Long Range Transportation Plan (LRTP) and also has preliminary engineering (including the environmental process) programmed in the MPO's FY 2013-2016 Transportation Improvement Program (TIP). It will be sponsored by the Georgia Department of Transportation. The older project described in the GMP, the "US Highway 80 Expansion Project" (PI #522490), currently is not funded in the MPO's LRTP or in the short-range TIP.	Made text changes at various locations in the document reflect the new project proposed for Highway 80.	Pages 25, 28, 35, 36, 57, 59, 141, 149, 152
• Although the currently funded US 80 project would have fewer acres of environmental impact than the previous four-lane widening concept, that fact does not reduce the importance of our first comment regarding the Wilderness Area boundary. At the Bull River Bridge, the currently planned project probably would extend farther from the current centerline than the previous widening concept would have, although final alignment is unknown.	Noted and responded to in the CORE MPO's first comment.	Page 47, lines 8–9; Page 63, lines 56–57 and lines 72–74
• We support the proposal in all of the GMP alternatives to extend the McQueen's Island Trail eastward to Tybee Island. As mentioned above, the MPO's US 80 Bridges Study proposes this extension as well as a barrier-separated path along a new bridge at Lazaretto Creek. The existing trail and the future extension also are currently proposed for the bicycle and pedestrian network in the MPO's Non-motorized Transportation Plan, expected to be adopted later this year.	Noted.	N/A
• Regarding any potential construction projects or land disturbing activities resulting from the GMP (visitor center, relocated parking lot), MPC provides the following comments for water resource protection: o Stormwater low impact development (LID) mechanisms such as grassy bioretention swales, tree islands, and parking lot curb cuts leading to gardens areas, should be incorporated into the engineering and development of the sites to provide viable mechanisms for managing and filtering stormwater produced on-site. Upon implementing LID practices, the high percentage of impervious surface coverage at completion as well as any impact to nearby water bodies will be dramatically lessened. o Where feasible, pervious/permeable paving should be used throughout to diminish the amount of petroleum, oils, and lubricants (POLs) running off of the parking lot's pavement via sheet flow into the nearby wetlands and marshes and to prevent the deterioration of water quality. o All land disturbing activities associated with the construction should be conducted in accordance with best management practices (BMPs) detailed in the Georgia Erosion and Sedimentation Control Act of 1975, as amended (O.C.G.A. 12-7-1) as well as the *Coastal Stormwater Supplement (CSS) to the Georgia Stormwater Management Manual (GSMM).* o If wetlands are impacted during any portions of the project and credits are required	Table 1 on page 23 of the draft general management plan / environmental impact statement contains a section on sustainable design and development, which specifically requires facilities to be located, built and modified according to the *Guiding Principles of Sustainable Design* (NPS 1993). This manual and a variety of laws, policies, and regulations obligate the National Park Service to create facilities that are harmonious with the environment, including water resources and wetlands. The National Park Service will comply with all applicable laws and regulations with regard to water resources and water quality. Specific measures for mitigating potential adverse impacts are beyond the scope of general management plans and will be included in subsequent plans and compliance processes for projects that emanate from the general management plan. There will be public involvement and outreach for each project if and when funds become available to implement them. Finally, the references to best management practices in the Georgia Erosion and Sedimentation Control Act of 1975 and the Chatham County Comprehensive Water Supply Management Plan have been added to the references	N/A

TABLE 14. RESPONSES TO PUBLIC COMMENTS

Fort Pulaski National Monument Draft GMP/EIS – Responses to Public Comments		
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to be purchased from a mitigation bank, it is suggested that those credits be purchased from a bank that is located in the same watershed as the one being impacted. o The Savannah River that is adjacent to the proposed site is a listed as impaired by the U.S. Environmental Protection Agency and has a total maximum daily load (TMDL) for dissolved oxygen. Practices to ensure the protection and prevention of contaminants from ultimately entering the river should be instituted at all costs. o Once construction is complete, please refer to the *Chatham County Comprehensive Water Supply Management Plan* for watering regulations and best management practices (BMPs).	section of the final general management plan / environmental impact statement.	
COMMENTS FROM NONGOVERNMENTAL ORGANIZATIONS		
National Parks Conservation Association (NPCA)		
• NPCA supports the inclusion in the final plan of 2 key points in Alternative C: 1. Alternative C, like Alternative B recommends that vegetation should be removed to better understand the sight lines during the historic battle (from the Union batteries at Goat Point to Fort Pulaski); however Alternative C removes less vegetation. Given costs constraints and the threat of invasive species, the sight lines proposed in Alternative C may be more efficient to maintain while still providing important interpretive understanding for monument visitors. 2. Alternative C also calls for an expansion of recreational access by expanding the trail system and launching facilities for canoes and kayaks at Lazaretto Creek. The Georgia Coast Salt Water Travel Trail could benefit from improved launching facilities. Ft. Pulaski is also part of the metropolitan statistical area of Savannah. The NPS Call to Action theme 'Connecting People to Parks' speaks to connecting urban communities to parks through trails, waterways and community green spaces and expanding the use of parks for healthy outdoor recreation. We believe this element from Alternative C would help accomplish that important goal.	1. The National Park Service believes that the strategy and mitigation for the removal of trees in the description of alternative B in chapter 2 addresses the concerns the National Parks Conservation Association raises about costs and the threat of invasive species. First, mature red cedars would only be removed as they succumb to disease, lightning damage, etc. Trees would be marked for removal by a surveyor and forester, in consultation with a cultural landscape specialist, to ensure that no more trees are removed than necessary to achieve desired sightlines. Second, with regard to invasive species, all the trees that would be removed are considered invasive for the location where they currently exist. 2. Alternative B does not preclude the possibility of expanding trails and boat launching facilities. The recreation zone in alternative B is the same configuration as it is for alternative C and boat launching facilities on Lazaretto Creek would be allowable under either alternative. Fort Pulaski would be able to expand boat launching facilities and trails under the NPS preferred alternative (alternative B) if sufficient funding for planning, construction, and environmental compliance were to become available. In addition, current plans of the Metropolitan Planning Commission include extending the McQueens Island Trail beyond the Fort Pulaski entrance to Lazaretto Creek and onto Tybee Island by means of improvement or replacement of the U.S. Highway 80 bridge over the creek.	Chapter 2, page 64

TABLE 14. RESPONSES TO PUBLIC COMMENTS

Fort Pulaski National Monument Draft GMP/EIS – Responses to Public Comments		
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• In 2007 NPCA conducted a State of the Parks Assessment at Fort Pulaski National Monument. Key findings indicted the need for additional research on the history of Fort Pulaski and Cockspur Island beyond the Civil War to expand understanding of monument resources and add to interpretive programs. Topics in need of further study include American Indian habitation, the construction of Fort Pulaski and the fort's role in the Underground Railroad.	The document referred to in the comment was included in the list of references for the draft general management plan / environmental impact statement and helped inform the development of alternatives. Language has been added to the section "Future Studies and Implementation Plans Needed" in chapter 2 acknowledging the need for further research.	Chapter 2, page 89
• Page 17, line 34-45 of the Draft GMP references Representative Jessie Jackson's language, inserted into FY 2000 NPS appropriations bill, directing the Secretary of Interior to encourage NPS managers of Civil War battle sites to recognize and include…the unique role that the institution of slavery played in causing the civil war and its role … at the individual site. We agree.	Noted.	N/A
• In Table 7, Summary of Impacts, Alternative B indicates that funding will be sought for archeological studies to provide information about the construction village that was necessary to recreate part of the cultural landscape… and prepare exhibits. NPCA suggests that perhaps additional research and interpretation could also deepen our understanding of the role of slavery and the Underground Railroad at Fort Pulaski.	Language has been added to the section "Future Studies and Implementation Plans Needed" in chapter 2 acknowledging the need for further research.	Chapter 2, page 91, line 1
• NPCA supports the Park Service's proposed Wilderness Study to evaluate options for designating wilderness and developing a formal wilderness proposal. Of concern is the traditional use of motorboats in the tidal Creeks of McQueen's Island. Although the Wilderness Act allows the continuation of traditional uses when those uses have been established, it is inherent in the definition of wilderness that there are outstanding opportunities for solitude and a primitive unconfined type of recreation. NPCA supports the park service's management of these areas in such a way as to preserve their wilderness characteristics to the maximum extent possible.	Noted.	N/A
Georgia Conservancy		
• The Plan proposes to submit 4,500 acres of pristine salt marsh on McQueens Island to Congress for approval as National Wilderness Area. The Wilderness Act also states that designated lands "shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character." 16 V.S.c. § 1131. McQueens Island is rich with rare pristine salt marsh habitats. … We strongly support any plan that calls for the preservation of untouched marshland habitat so that it may flourish and in its natural and primitive state.	Noted.	N/A

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Fort Pulaski National Monument Draft GMP/EIS – Responses to Public Comments		
Comment	**Response to Comment**	**Location of Response**
• Over the next twenty years, climate change will have an effect on Park management. The Plan recognizes the immediate and unique vulnerability that coastal environments face with regard to climate change, particularly sea level rise, and recommends the topic be "retained for analysis." The rising sea level and resulting alteration of the marsh, coupled with the probable dredging of the Savannah River, only underscores the wetland vulnerability and likelihood of habitat conversion. While we understand the topic is complex, we strongly encourage the development and implementation of a proactive climate change strategy that maximizes the protection of priority habitat.	The National Park Service recognizes that climate change is an enormous threat to the integrity of the national park system. Coastal monuments such as Fort Pulaski are especially vulnerable to the effects of global warming and sea level rise. The National Park Service has developed a climate change response strategy that incorporates climate change considerations and responses in all levels of NPS planning. Text changes and additions have been made in several locations (see next column) that provide more details regarding how resources may be impacted by climate change and the different strategies that will be employed to respond to climate change.	Table 1, page 20; page 29; Mitigative Measures Common to All Action Alternatives section, page 84; Future Studies and Implementation Plans Needed section, page 89; multiple locations in chapter 3: page 104, 105, 109, 110, 113, and 116.
Comments from the NPS Planning, Environment, and Public Comment (PEPC) website.		
Only two comments were received in PEPC. These were from the Georgia Conservancy and the NPCA. Both of these have been addressed in the section on nongovernmental organizations above.		

David Libman, National Park Service

REFERENCES, APPENDIXES, LIST OF PREPARERS, INDEX

SELECTED REFERENCES

Alexander, C.
2008 "Rates and Processes of Shoreline Change at Fort Pulaski National Monument." Unpublished report submitted to the National Park Service.

Backlund, P., A. Janetos, and D. Schimel
2008 The effects of climate change on agriculture, land resources, water resources, and biodiversity in the United States. Synthesis and Assessment Product 4.3., U.S. Environmental Protection Agency, Climate Change Science Program, Washington, D.C.

Boesch, D. F., J. C. Field, and D. Scavia
2000 "The potential consequences of climate variability and change on coastal areas and marine resources: Report of the Coastal Areas and Marine Resources Sector Team, U.S. National Assessment of the Potential Consequences of Climate Variability and Change." U.S. Global Change Research Program, Silver Spring, MD.

Booth, D. T.
2006 "Influence of incubation temperature on hatchling phenotype in reptiles." Physiological and Biochemical Zoology 79:274-281.

Bureau of Economic Analysis
2008 *Regional Economic Accounts* [Brochure]. http://www.bea.gov/regional/reis/default.cfm?catable=CA25: U.S. Department of Commerce.

Burkett, V. R., D. A. Wilcox, R. Stottlemyer, W. Barrow, D. Fagre, J. Baron, J. Price, J. L. Nielsen, C. D. Allen, D. L. Peterson, G. Ruggerone, and T. Doyle
2005 "Nonlinear dynamics in ecosystem response to climatic change: Case studies and policy implications." Science Direct: 357–394.

Cathey, H.
1990 South-East U.S. Zones 5b–10b. *The United States National Arboretum USDA Plant Hardiness Zone Map*, *1475*, Retrieved February 4, 2009, from http://www.usna.usda.gov/Hardzone/hzm-se1.html

Center for Quality Growth and Regional Development at the Georgia Institute of Technology
2006 Georgia Coast 2030: Population Projections for the 10-county Coastal Region.

Center for Watershed Protection
2009 *Coastal Stormwater Supplement to the Georgia Stormwater Management Manual.* Ellicott City, MD.

Coastal Georgia Regional Development Center, CEDS Strategy Committee
2007 *Comprehensive Economic Development Strategy (CEDS).* Prepared for U.S. Department of Commerce Economic Development Administration.

Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe
1979 *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service. Publication FWS/OBS-79/31. Washington, D.C: U.S. Government Printing Office.

Desantis, L. R. G., S. Bhotika, K. Williams, and F. E. Putz
2007 "Sea-level rise and drought interactions accelerate forest decline on the Gulf Coast of Florida, USA." Global Change Biology 13:2349-2360.

Ebi, K. L., G. A. Meehl, D. Bachelet, and D. F. Boesch
2007 "Regional impacts of climate change: Four case studies in the United States." Pew Center on Global Climate Change, Arlington, VA.

Elfner, Mary A.
2005 Tybee Island Beach Management Plan. Prepared for the City of Tybee Island, GA.

Elmore, Charles J., PhD
2002 *General David Hunter's Proclamation: The Quest for African-American Freedom, Before and During the Civil War*. Fort Washington, PA: Eastern National.

Environmental Laboratory
1987 "Corps of Engineers Wetlands Delineation Manual" (Technical Report Y-87-1). Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station. NTIS No. AD A176 912.

Florida State University, Center for Ocean-Atmospheric Prediction Studies
2009 "Climate Data for Savannah Hilton Head International." Retrieved June 30 from http://gis.coaps.fsu.edu/cgi-bin/mapserv.exe?mode=query&map=c:inetpubwwwrootmsmapfiles TerrClim.map&imgext=-82.15234375+31.419921875+-80.27734375+32.826171875&imgxy=320+239&imgbox=320+239+320+239&imgsize=640+480

Frumhoff, P. C., J. J. McCarthy, J. M. Melillo, S. C. Moser, and D. J. Wuebbles
2006 Climate change in the U.S. Northeast. Union of Concerned Scientists (UCS), Cambridge, MA.

Georgia Department of Natural Resources (GADNR), Coastal Resources Division
2008 "Sea Turtles." Retrieved from http://crd.dnr.state.ga.us/content/displaycontent.asp?txtDocument=365

Georgia Department of Natural Resources, Environmental Protection Division
2001 *Savannah River Basin I Plan 2001,* Section 5, "Assessments of Water Quantity and Quality." Retrieved from http://www.gaepd.org/Documents/savannah.html

2009 *Air Protection in Georgia*. Retrieved from http://www.gaepd.org/Documents/index_air.html

Georgia Ports Authority (GPA)
1998 *Environmental Impact Statement – Savannah Harbor Feasibility Study*. Available online: http://sav-harbor.com/index.html#Backgnd

Govus, Thomas E.
1998 *Fort Pulaski National Monument Inventory Final Report Part A: Plants.* Prepared for the National Park Service, Southeast Region.

Groh, Lou
1999 *Fort Pulaski National Monument Archeological Overview and Assessment*. Tallahassee: National Park Service, Southeast Archeological Center.

Harvell, C. D., K. Kim, J. M. Burkholder, R. R. Colwell, P. R. Epstein, D. J. Grimes, E. E. Hofmann, E. K. Lipp, A. Osterhaus, and R. M. Overstreet
1999 "Emerging marine diseases - climate links and anthropogenic factors." Science 285:1505.

Hawkes, L. A., A. C. Broderick, M. H. Godfrey, and B. J. Godley
2007 "Investigating the potential impacts of climate change on a marine turtle population." Global Change Biology 13:923-932.

Howell, Susan Meredith
2004 "Shoreline Change At Fort Pulaski, Georgia: A Remote Sensing Approach." Georgia Southern University, Skidaway Institute of Oceanography. Presentation to Geological Society of America, Northeastern Section (39th Annual) and Southeastern Section (53rd Annual) Joint Meeting (March 25–27), Washington, DC.

HurricaneCity.com
2009 "Savannah, Georgia's History with Tropical Systems." http://www.hurricanecity.com/city/savannah.htm.

Loehman, R. and G. Anderson
2009 *Understanding the science of climate change: talking points — impacts to the Atlantic Coast.* Natural Resource Report NPS/NRPC/NRR-2009/095. National Park Service, Fort Collins, Colorado.

Lovett, G. M., C. D. Canham, M. A. Arthur, K. C. Weathers, and R. D. Fitzhugh
2006 "Forest ecosystem responses to exotic pests and pathogens in eastern North America." BioScience 56:395–405.

McFarlin, C. and M. Alber
2005 *Assessment of Coastal Water Resources and Watershed Conditions at Fort Pulaski National Monument*. (Technical Report NPS/NRWRD/NRTR-2005/345). Prepared for the National Park Service, Water Resources Division, Natural Resource Program Center.

Meader , J. Faith and Cameron Binkley, ed.
2003 *Fort Pulaski National Monument Administrative History*. Atlanta: National Park Service, Cultural Resources Division, Southeast Regional Office.

Michener, W. K., E. R. Blood, K. L. Bildstein, M. M. Brinson and L. R. Gardner
1997 "Climate Change, Hurricanes and Tropical Storms, and Rising Sea Level in Coastal Wetlands." Ecological Applications 7(3): 770–801.

Mobley, Chuck
2007 "Enemies from Within, Without Threaten Savannah River Landmark." Savannah Morning News, November 16.

National Assessment Synthesis Team
2000 Climate change impacts on the United States: the potential consequences of climate variability and change. U.S. Global Change Research Program.

National Oceanic and Atmospheric Administration (NOAA)
2008 NOAA Fisheries: Office of Protected Species. http://www.nmfs.noaa.gov/pr/species/fish/shortnosesturgeon.htm

National Marine Fisheries Service (NMFS)
1998 *Recovery Plan for the Shortnose Sturgeon (Acipenser brevirostrum)*. Prepared by the Shortnose Sturgeon Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland.

National Parks Conservation Association (NPCA)
2007 *Fort Pulaski National Monument: A Resource Assessment*.

National Park Service (NPS), U.S. Department of the Interior
1995a *Fort Pulaski National Monument Collection Management Plan*. Atlanta: National Park Service, Museum Services Division, Southeast Regional Office.

1995b "Test Excavations at Civil War Period Battery Halleck, Fort Pulaski National Monument, Chatham County, Georgia" (Technical Reports No. 2, Interagency Archeological Services Division). Atlanta: National Park Service.

2001 Cost Estimating Guideline with Class "C" Cost Data: New Construction.

2004 "Fort Pulaski National Monument, Quarantine Attendant's Quarters, Historic Structure Report." Atlanta: National Park Service, Historical Architecture, Cultural Resources Division, Southeast Regional Office.

2006a *Management Policies 2006*.

2006b "Trip Report on Site Condition Assessments, Fort Pulaski National Monument, November 28–December 2, 2005." (SEAC Acc. 2012, September 21.) Tallahassee: National Park Service, Southeast Archeological Center.

2006c *Fort Pulaski National Monument Long Range Interpretive Plan*.

2006d *Southeast Region Museum Collection Curatorial Facility Plan – May 2006*.

2008a *Cockspur Island Lighthouse Archeological Investigation Report*. Tallahassee: National Park Service, Southeast Archeological Center.

2008b Bank Stabilization of the Cockspur Island Lighthouse, Draft Environmental Assessment.

2009a *Fort Pulaski National Monument Cultural Landscape Report*. Atlanta: National Park Service, Cultural Resources Division, Southeast Regional Office.

2009b *Fort Pulaski NHS Reports*. National Park Service Public Use Statistics Office. http://www.nature.nps.gov/stats/park.cfm?parkid=365

Padgett, Mark J.
2008 U.S. Army Corps of Engineers, Savannah District, email to Mike Hosti, Chief of Maintenance Division, Fort Pulaski National Monument, September 24 re: Wetlands Analysis of Land Behind Fort Pulaski Visitor Center.

Passarelli, N., and T. Curtis
2010 "Ichthyology Biological Profiles: Smalltooth Sawfish." Retrieved from http://www.flmnh.ufl.edu/fish/gallery/descript/Stsawfish/STSawfish.html

Rabolli, C., and K. Ellington
1999 Fort Pulaski National Monument Inventory Final Report; Part B: Vertebrate Animals. Prepared for the National Park Service, Southeast Region.

Savannah Area Chamber of Commerce
2009 Welcome to Savannah Area Chamber. Retrieved July 8, 2009, from Savannah Area Chamber Web site: http://www.savannahchamber.com/

Toma, M. J., and J. Bice
2006 The Economic Impact of Manufacturing in the Savannah Area, 2005. Retrieved July 8, 2009, from http://www.savannahchamber.com/images/pdf/ManufactrImpct.pdf

U.S. Army Corps of Engineers (USACE)
2003 Evaluations of Benthic Communities and Sediments; Savannah Harbor; Savannah, Georgia.

U.S. Army Corps of Engineers, Wilmington District
2007 *Savannah Harbor Expansion Bank Erosion Study, Fort Pulaski & North Tybee Island Georgia.*

U.S. Census Bureau, Population Division
2009 *Population Estimates* http://www.census.gov/popest/estimates.php

U.S. Department of the Interior, Office of The Solicitor, Southeast Regional Office
2006 Legal Opinion Memorandum re Exchange at Fort Pulaski National Monument. October 13.

U.S. Environmental Protection Agency (USEPA)
1997 *Climate Change and Georgia*. (EPA 230-F-97-008j). Office of Policy, Planning, and Evaluation.

2009 "Beach Profile for Tybee Island North." (Beach Advisory and Closing Online Notification). Retrieved from http://www.epa.gov

U.S. Fish and Wildlife Service (USFWS)
2008 *Savannah National Wildlife Refuge*. Accessed: http://www.fws.gov/savannah

U.S. Geological Survey
2002 Vulnerability of U.S. National Parks to Sea-Level Rise and Coastal Change. (Fact Sheet FS–095–02.)

APPENDIXES

APPENDIX A: LIST OF RELEVANT LEGISLATION

Laws and executive orders that apply to the management of Fort Pulaski National Monument are provided below.

FORT PULASKI SPECIFIC LEGISLATION AND EXECUTIVE ORDERS

Presidential Proclamation No. 1713 (43 Stat. 1968), October 15, 1924. Established Fort Pulaski National Monument under the authority of the Antiquities Act of 1906 (16 USC 431–433).

Executive Order No. 6166 issued pursuant to the authority of Section 16 of the Act of March 4, 1933 947 Stat. 1517). Transferred Fort Pulaski National Monument from the War Department to the National Park Service.

Act of Congress (49 Stat. 1979), June 26, 1936. Expanded the boundaries of the national monument.

Presidential Proclamation (72 Stat. 1), August 14, 1958. Expanded the boundary of Fort Pulaski to include the Cockspur Island Lighthouse and Daymark Island.

Public Law 104-333 (110 Stat. 4188), November 12, 1996. Cancelled the authority of the U.S. Army Corps of Engineers to deposit dredge spoil on the north shore of Cockspur Island.

NATIONAL PARK SERVICE ENABLING LEGISLATION

Act of August 25, 1916 (National Park Service Organic Act); Public Law 64-235; 16 United States Code Section 1 et seq. as amended

Reorganization Act of March 3, 1933; 47 Stat. 1517

General Authorities Act, October 7, 1976; Public Law 94-458; 90 Stat. 1939; 16 United States Code 1a-1 et seq.

Act amending the Act of October 2, 1968 (commonly called Redwoods Act), March 27, 1978; Public Law 95-250; 92 Stat. 163; 16 United States Code Subsection(s) 1a-1, 79a-q

National Parks and Recreation Act, November 10, 1978; Public Law 95-625; 92 Stat. 3467; 16 United States Code 1 et seq.

OTHER LAWS AFFECTING NPS OPERATIONS

Accessibility

Architectural Barriers Act of 1968; Public Law 90-480; 82 Stat. 718; 42 United States Code 4151 et seq.

Rehabilitation Act of 1973; Public Law 93-112; 87 Stat. 357; 29 United States Code 701 et seq. as amended by the Rehabilitation Act Amendments of 1974; 88 Stat. 1617

Cultural Resources

American Indian Religious Freedom Act; Public Law 95-341; 92 Stat. 469; 42 United States Code 1996

Antiquities Act of 1906; Public Law 59-209; 34 Stat. 225; 16 United States Code 432; 43 *Code of Federal Regulations* 3

Archeological and Historic Preservation Act of 1974; Public Law 93-291; 88 Stat. 174; 16 United States Code 469

Archeological Resources Protection Act of 1979; Public Law 96-95; 93 Stat. 712; 16 United States Code 470aa et seq.; 43 *Code of Federal Regulations* 7, subparts A and B; 36 Code of Federal Regulations 79

Indian Sacred Sites. Executive Order 13007. 3 *Code of Federal Regulations* 196 (1997).

National Historic Preservation Act as amended; Public Law 89-665; 80 Stat. 915; 16 United States Code 470 et seq.; 36 *Code of Federal Regulations* 18, 60, 61, 63, 65, 79, 800

Protection of Historic and Cultural Properties, Executive Order 11593; 36 *Code of Federal Regulations* 60, 61, 63, 800; 44 *Federal Register* 6068

Public Buildings Cooperative Use Act of 1976; Public Law 94-541; 90 Stat. 2505; 42 United States Code 4151-4156

Natural Resources

Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act; E.S. 80-3, 08/11/80, 45 *Federal Register* 59109

Clean Air Act as amended; Public Law Chapter 360; 69 Stat. 322; 42 United States Code 7401 et seq.

Coastal Zone Management Act of 1972 as amended; Public Law 92-583; 86 Stat. 1280; 16 United States Code 1451 et seq.

Endangered Species Act of 1973, as amended; Public Law 93-205; 87 Stat. 884; 16 United States Code 1531 et seq.

Executive Order 11988, "Floodplain Management"; 42 *Federal Register* 26951; 3 *Code of Federal Regulations* 121 (Supp 177)

Executive Order 11990, "Protection of Wetlands"; 42 *Federal Register* 26961; 3 *Code of Federal Regulations* 121 (Supp 177)

Executive Order 11991, "Protection and Enhancement of Environmental Quality"

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations"

Federal Caves Resource Protection Act of 1988

Federal Insecticide, Fungicide, and Rodenticide Act; Public Law 92-516; 86 Stat. 973; 7 United States Code 136 et seq.

Federal Water Pollution Control Act (commonly referred to as Clean Water Act); Public Law 92-500; 33 United States Code 1251 et seq. as amended by the Clean Water Act; Public Law 95-217

Fish and Wildlife Coordination Act of 1958 as amended; Public Law 85-624; 72 Stat. 563; 16 United States Code 661 et seq.

Migratory Bird Conservation Act; Public Law Chapter 257; 45 Stat. 1222; 16 United States Code 715 et seq.

Migratory Bird Treaty Act of 1918; Public Law 186; 40 Stat. 755

Magnuson-Stevens Fishery Conservation and Management Act

National Environmental Policy Act of 1969; Public Law 91-190; 83 Stat. 852; 42 United States Code 4321 et seq.

National Park System Final Procedures for Implementing Executive Orders 11988 and 11990 (45 *Federal Register* 35916 as revised by 47 *Federal Register* 36718)

Protection and Enhancement of Environmental Quality; Executive Order 11514 as amended, 1970; Executive Order 11991; 35 *Federal Register* 4247; 1977; 42 *Federal Register* 26967)

Resource Conservation and Recovery Act; Public Law 94-580; 30 Stat. 1148; 42 United States Code 6901 et seq.

Rivers and Harbors Act of 1899; 33 United States Code Chapter 425, as amended by Public Law 97-332, October 15, 1982 and Public Law 97-449; 33 United States Code 401-403

Water Resources Planning Act of 1965 (Public Law 89-80; 42 United States Code 1962 et seq.) and Water Resource Council's Principles and Standards; 44 *Federal Register* 723977

Watershed Protection and Flood Prevention Act; Public Law 92-419; 68 Stat. 666; 16 United States Code 100186

Other

Administrative Procedures Act; 5 United States Code 551–559, 701–706

Concessions Policy Act of 1965; Public Law 89-249; 79 Stat. 969; 16 United States Code 20 et seq.

Department of Transportation Act of 1966; Public Law 89-670; 80 Stat. 931; 49 United States Code 303

Energy Supply and Environmental Coordination Act of 1974

Executive Order 12003: *Energy Policy and Conservation*; 3 *Code of Federal Regulations* 134 (Supp 1977); 42 United States Code 2601

Executive Order 12088: Federal Compliance with Pollution Control Standards

Executive Order 12372: *Intergovernmental Review of Federal Programs*; 47 *Federal Register* 30959

Farmland Protection Policy Act PL-97-98

Forest and Rangeland Renewable Resources Planning Act; Public Law 95-307; 92 Stat. 353; 16 United States Code 1600 et seq.

Freedom of Information Act; Public Law 93-502; 5 United States Code 552 et seq.

Intergovernmental Cooperation Act of 1968; Public Law 90-577; 40 United States Code 531-535 and 31 United States Code 6501-6508

Intergovernmental Coordination Act of 1969; 42 United States Code 4101, 4231, 4233

Noise Control Act of 1972 as amended; Public Law 92-574; 42 United States Code 4901 et seq.

Outdoor Recreation Coordination Act of 1963; Public Law 88-29; 77 Stat. 49

Payment in Lieu of Taxes Act; Public Law 94-565; 90 Stat. 2662; 31 United States Code 6901 et seq.

Surface Transportation Assistance Act of 1982; 96 Stat. 2097; 23 United States Code 101; and many others

Wildfire Disaster Recovery Act; Public Law 101-286

Management Polices 2006

This is an update to the *2001 Management Policies*. The policies are derived from the laws that have been enacted to establish and govern the National Park Service and the national park system. This document serves as the basic, servicewide policy manual used by park superintendents and other NPS managers to guide their decision-making. The manual prescribes policies that enable the National Park Service to preserve park resources and values unimpaired for the enjoyment of future generations, as required by law. The policies have been updated to keep pace with new laws that have been enacted, changes in technology and American demographics, and new understandings of the kinds of actions that are required to best protect the natural and cultural resources of the parks. The policies stress the importance of: using the parks for educational purposes; demonstrating environmental leadership in the parks;

managing park facilities and resources in ways that will sustain them for future generations of Americans to enjoy; and working with partners to help accomplish the NPS mission. The new *Management Policies 2006* is available on the NPS website at http://www.nps.gov/policy/MP2006.pdf .

Director's Order 12

Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* describes the policy and procedures by which the National Park Service will comply with the National Environmental Policy Act. The Council on Environmental Quality, part of the Executive Office of the President, is the "caretaker" of the National Environmental Policy Act. The National Park Service is required to abide by all NEPA regulations (40 CFR 1500–1508) and any other procedures and requirements imposed by other higher authorities, such as the Department of the Interior.

Director's Order 24

Director's Order 24: *NPS Museum Collections Management* lays the foundation by which the National Park Service meets its responsibilities toward museum collections. This director's order provides policy guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, and use of, NPS museum collections.

Director's Order 28 (NPS 1998e)

Director's Order 28: *Cultural Resource Management* issued pursuant to 16 United States Code (1 through 4), addresses cultural resource management. The National Park Service will protect and manage cultural resources in its custody through effective research, planning, and stewardship and in accordance with the policies and principles in NPS *Management Policies 2006*.

Director's Order 28A

Director's Order 28A: *Archeology* provides a management framework for planning, reviewing, and undertaking archeological activities and other activities that may affect archeological resources within the National Park System.

Director's Order 47

Director's Order 47: *Soundscape Preservation and Noise Management* articulates National Park Service operational policies that will require, to the fullest extent practicable, the protection, maintenance, or restoration of the natural soundscape resource in a condition unimpaired by inappropriate or excessive noise sources.

Director's Order 75A

Director's Order 75A: *Civic Engagement and Public Involvement* clarifies and strengthens the commitment of the National Park Service to legally required public involvement and participation as it relates to accomplishing its mission and management responsibilities under the NPS Organic Act of 1916.

Director's Order 77-1

Director's Order 77-1: *Wetland Protection* establishes NPS policies, requirements, and standards for implementing Executive Order (E.O.) 11990: "Protection of Wetlands" (42 Fed. Reg. 26961). E.O. 11990 was issued by President Carter in 1977, in order "…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...."

Directors Order 77-2

Directors Order 77-2: *Floodplain Management* applies to all NPS proposed actions, including the direct and indirect support of floodplain development that could adversely affect the natural resources and functions of floodplains, including coastal floodplains, or increase flood risks. This director's order also applies to existing actions when they are the subjects of regularly occurring updates of NPS planning documents.

This director's order does not apply to historic or archeological structures, sites, or artifacts whose location is integral to their significance or to certain actions as specifically identified in *Procedural Manual 77-2: Floodplain Management*.

APPENDIX B: WILDERNESS ELIGIBILITY ASSESSMENT

INTRODUCTION

The Wilderness Act of 1964 (16 USC § 1131 *et seq*.) states that it is national policy to "secure for the American people of present and future generations the benefits of an enduring resource of wilderness." The purpose of the act is to preserve and protect wilderness characteristics and values over the long term, while at the same time providing opportunities for solitude and unconfined recreation.

The Wilderness Act defines wilderness as "an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation which is protected and managed so as to preserve its natural conditions…." 16 USC § 1131I.

New wilderness areas can only be designated by act of Congress. Such designations typically take place after, and are based on, the completion of a formal wilderness study. The wilderness study is a detailed assessment of federally owned lands in a particular area that have been deemed "eligible" for possible wilderness designation. In that regard, the Wilderness Act, together with regulations at 43 CFR Part 19, NPS *Management Policies 2006*, and Director's Order 41: *Wilderness Preservation and Management,* require that the National Park Service review all areas within a park to identify those areas, if any, that are eligible for possible wilderness designation based on the criteria contained in the Wilderness Act and NPS policies. The criteria for eligibility are as follows.

National Park Service lands will be considered eligible for wilderness if they are at least 5,000 acres or of sufficient size to make practicable their preservation and use in an unimpaired condition, and if they possess the following characteristics (as identified in the Wilderness Act):

- The earth and its community of life are untrammeled by humans, where humans are visitors and do not remain.
- The area is undeveloped and retains its primeval character and influence without permanent improvements or human habitation.
- The area generally appears to have been affected primarily by the forces of nature, with the imprint of humans' work substantially unnoticeable.
- The area is protected and managed so as to preserve its natural conditions.
- The area offers outstanding opportunities for solitude or a primitive and unconfined type of recreation.

NPS *Management Policies 2006*, section 6.2.1.1, "Primary Eligibility Criteria."

RESULTS AND RATIONALE

The wilderness eligibility assessment for Fort Pulaski National Monument was performed by an interdisciplinary team comprising specialists from the monument and the Southeast Regional Office. The team determined that approximately 4,500 acres of salt marsh on McQueens Island meet the criteria and therefore are eligible for wilderness designation. These lands generally appear to have been affected primarily by the forces of nature with minimal evidence of human activity. These areas of Fort Pulaski National Monument offer outstanding opportunities for solitude or for primitive and unconfined recreation.

The eligible lands comprise two areas of salt marsh within NPS Tract 01-102 on McQueens Island. Specifically, the eligible areas may be described as follows:

a) All that portion of NPS Tract 01-102 bounded west and north by a line lying 100 feet south of, and paralleling, the centerline of Old U.S. Highway 80/Tybee Road and new U.S. Highway 80 to a point east of the Fort Pulaski National Monument entrance road; on the east by a line extending south from the foregoing point to Lazaretto Creek, and from there by the mean high tide line of Lazaretto Creek; and on the south by the mean high tide lines of Lazaretto Creek, Tybee River, and Bull Creek.
b) All that portion of NPS Tract 01-102 bounded west by the mean high tide line of the Intracoastal Waterway; south by the mean high tide lines of St. Augustine and Bull creeks; east by a line lying 100 feet west of the centerline of U.S. Highway 80, which line parallels said centerline until extending north to a point 50 feet south of the edge of the right-of-way of the old Savannah-Tybee Island railroad grade; and north by a line 50 feet south of, and paralleling, the right-of-way of the old Savannah-Tybee Island railroad grade.
c) All as shown on figure 2-1. The foregoing eligible areas total approximately 4,500 acres on McQueens Island. In the event of a conflict between this acreage figure and the map, the map is intended to be controlling.

The areas described previously consist entirely of undeveloped salt marsh. As such, they meet the criteria established by law for designation as wilderness. Specifically, in both areas the natural processes of the salt marsh are essentially intact, indicating that these areas have been affected primarily by the forces of nature. Although development is visible when looking out into the surrounding uplands, inside the marsh itself there are no structures or other permanent improvements, i.e., the imprint of humans' work is substantially unnoticeable. Furthermore, the National Park Service has, and will continue to, protect and manage these areas so as to preserve their natural conditions. Finally, some limited opportunities for solitude or a primitive and unconfined type of recreation exist inside these areas (opportunities are limited not by a lack of primitive conditions, but by the nature of the salt marsh itself).

For these reasons, the previously described areas on McQueens Island are eligible for designation as wilderness by Congress. Accordingly, the National Park Service will manage these areas in such a way as to preserve their wilderness character, as required by NPS *Management Policies 2006* § 6.3.1, until such time as the legislative process of wilderness designation has been completed.

APPENDIX C: THREATENED AND ENDANGERED SPECIES

Species	Scientific Name	Federal Status	State Status
Mammal			
Humpback whale	*Megaptera novaeangliae*	E	E
Right whale	*Eubalaena glacialis*	E	E
West Indian manatee	*Trichechus manatus*	E	E
Bird			
Bachman's warbler	*Vermivora bachmanii*	E	E
Bald eagle	*Haliaeetus leucocephalus*	T	E
Gull-billed tern	*Sterna nilotica*	No federal status	T
Piping plover	*Charadrius melodus*	T	T
Red-cockaded woodpecker	*Picoides borealis*	E	E
Wood stork	*Mycteria americana*	E	E
Reptile			
Eastern indigo snake	*Drymarchon corais couperi*	T	T
Gopher tortoise	*Gopherus polyphemus*	No federal status	T
Green sea turtle	*Chelonia mydas*	T	T
Hawksbill sea turtle	*Eretmochelys imbricata*	E	E
Kemp's ridley sea turtle	*Lepidochelys kempi*	E	E
Leatherback sea turtle	*Dermochelys coriacea*	E	E
Loggerhead sea turtle	*Caretta caretta*	T	T
Amphibian			
Flatwoods salamander	*Ambystoma cingulatum*	T	T
Fish			
Shortnose sturgeon1	*Acipenser brevirostrum*	E	E
Plant			
Climbing buckthorn	*Sageretia minutiflora*	No federal status	T
Narrowleaf obedient plant	*Physostegia leptophylla*	No federal status	T
Pondberry	*Lindera melissifolia*	E	E

APPENDIX D: FLOODPLAIN STATEMENT OF FINDINGS

Statement of Findings for
Executive Order 11988, "Floodplain Management"
Fort Pulaski National Monument
General Management Plan

Recommended:

Superintendent, Fort Pulaski National Monument — Date: 11·26·12

Concurred:

Chief, Water Resources Division — Date: 12-5-12

Approved:

Acting Regional Director, Southeast Region — Date: 12/7/12

INTRODUCTION

In accordance with Executive Order 11988, "Floodplain Management" the National Park Service has reviewed the flood hazards in Fort Pulaski National Monument and has prepared this "Statement of Findings."

In examining the monument, the structures at the following sites were identified as being within a regulatory 100-year floodplain:

1) National Park Service Sites
   Twenty-nine existing structures, including Fort Pulaski, historic dike system, visitor center, detached restrooms, parking area, historic residence, Cockspur Island Lighthouse, maintenance facility, road system. One proposed new structure: the visitor center annex.

2) U.S. Coast Guard Site
   Miscellaneous structures: administrative building, parking area, communications structures, fueling facility, and dock

3) Savannah Pilots Association Site
   Miscellaneous structures: administrative building, parking area, fueling facility, and dock

There are no other occupied structures within a regulatory floodplain at these sites that warrant inclusion in this flood hazard assessment.

This "Statement of Findings" focuses on evaluating the flood hazards for the aforementioned structures in the 100-year floodplain. As a part of the effort to develop a general management plan (GMP) for the monument, the "Statement of Findings" describes the flood hazard, alternatives, and possible mitigation measures for the continued use of this area. Additional detail regarding the monument lands and resources, future actions to be taken in the area, and environmental impacts may be found in the *General Management Plan / Wilderness Study / Environmental Impact Statement*.

DESCRIPTION OF THE SITES AND USES

National Park Service Sites

The following inventory of structures in the floodplain at Fort Pulaski is taken in large part from the monument's list of classified structures. The list of classified structures is an evaluated inventory of all historic and prehistoric structures within the monument boundary that have historical, architectural, and/or engineering significance. The various structures on the list of classified structures are described in the following the table, sorted by significance level.

LIST OF CLASSIFIED STRUCTURES

Catalog Number	Name	Significance Level
HS-09	Dike	Contributing
HS-10	Canal Lock	Contributing
HS-11	Feeder Canal	Contributing
HS-2A1	Cistern No. 5 (Ruin)	Contributing
HS-2A2	Cistern No. 4	Contributing
HS-2A4	Cistern No. 1	Contributing
HS-2A6	Cistern No. 2	Contributing
HS-2A7	Cistern No. 3	Contributing
HS2B3	Cistern No. 6	Contributing
HS2B5	Stones from Cistern (ruin)	Contributing
HS-03	North Channel Pier (Ruin)	Local
HS-06	Residence	Local
HS-2A3	Brick Foundation Ruin at Cistern No. 4	Local
HS-2A5	Brick Foundation Ruin at Cistern No. 3	Local
HS2B4	Cistern No. 7	Local
HS-01	Fort Pulaski	National
HS-07	Moat	National
HS-08	Demilune	National
CS-01	John Wesley Memorial	Not Significant
HS-13	Lieutenant Robert Rowan Grave Stone	Not Significant
HS-14	Sellmer, Charles Howard, Grave Marker	Not Significant
HS-04	Cockspur Island Lighthouse	State
HS-05	Battery Horace Hambright	State

Dike. The dike, which allowed the island to be drained, was essential to the construction of Fort Pulaski. This historic engineering structure is directly associated with Robert E. Lee, who designed it. The dike is an earthen structure approximately 4–5 feet above grade with an irregular circumference of 2 miles.

Canal Lock. The canal lock controls water flow between the moat and the feeder canal and kept tidal flooding out. This is also part of the water control system designed by Robert E. Lee. Water from the canal enters this arched brick tunnel, containing a tide gate, just before it enters the moat. The tunnel is flanked by brick retaining walls; the dimensions are 51 feet by 77 feet. A metal valve handle that controls the gate lies just north.

Feeder Canal. The feeder canal is an engineering structure that provides water to the fort's moat and is part of the water control system designed by Robert E. Lee. The canal is approximately 2,000 feet long and runs south from the moat to the South Channel Savannah River. The canal banks are earthen except near the moat, where there are brick retaining walls.

Cistern No. 5 (Ruin). This cistern, one of several that supplied water to laborers living on-site during the construction of Fort

Pulaski, is significant as an example of early 19th century utilitarian structure. These are the remains of a 15-foot-diameter round cistern. Visible on the ground surface are pieces of the stone cistern cover.

Cistern No. 4. This cistern, associated with the post-construction history of Fort Pulaski is significant as a 19th century utilitarian structure. The 14.67-foot-diameter brick cistern has been filled with sand. No trace of a cistern cover is visible.

Cistern No. 1. This cistern, one of several that supplied water to laborers living on-site during the construction of Fort Pulaski, is significant as an example of early 19th century utilitarian structure. The structure is a 9-foot-diameter circular brick cistern with a cement coating on the brick and a sandstone cap. The cistern rises approximately 4 feet above grade.

Cistern No. 2. This cistern, one of several that supplied water to laborers living on-site during the construction of Fort Pulaski, is significant as an example of early 19th century utilitarian structure. The structure is a circular brick cistern 9 feet in diameter with a sandstone cap. The cistern rises approximately 3 feet above grade, is filled with sand, and exhibits the remains of a cement coating over the brick.

Cistern No. 3. This cistern, one of several that supplied water to laborers living on-site during the construction of Fort Pulaski, is significant as an example of early 19th century utilitarian structure. The structure is a circular brick cistern, 13 feet in diameter, with a smaller, square opening set into the top. Portions of the stone cap remain along with remnants of a cement coating on the brick.

Cistern No. 6. This cistern, one of several that supplied water to laborers living on-site during the construction of Fort Pulaski, is locally significant as an example of early 19th century utility structure. The structure is a large brick, stone, and mortar cistern approximately 12 feet in diameter and 2 feet high. The cistern head is a rectangular brick box (5 feet by 5 feet) with a 3-foot-square opening.

Stones from Cistern (Ruin). Apparently pieces of the cover of a cistern.

North Channel Pier (Ruin). This was the first structure built in association with Fort Pulaski and was the receiving point for materials used in the fort's construction. The ruins consist of approximately 20 feet by 10 feet of a 200-foot-long, L-shaped granite pier. Portions of the side walls, with some iron hardware, end in the remains of a tabby end wall. Granite pavers that once supported iron tracks for cannon carriages at the fort have been relocated to the end of the pier.

Residence. Locally significant for architecture and its association with the U.S. Public Health Service quarantine station on Cockspur Island. Remodeled and used by the Navy as officers' quarters during World War II, the interior contains many historic features and materials from that period. In 1998, the building underwent numerous alterations that together gave the building an appearance that it never had. These included the addition of double-hung windows to part of the porch and construction of a wide, straight flight of stairs to the east porch that never existed during the historic period. In addition, the exterior siding and porthole windows installed by the Navy to enclose the elevated foundation were removed and replaced with plywood and lattice, another feature that was never present during the historic period. The structure has been adapted for monument headquarters offices, which is the current use.

Brick Foundation Ruin at Cistern No. 4. This ruin, associated with a cistern for workers on Fort Pulaski, is significant as an example of an early 19th century utilitarian structure. The ruin is a rectangular brick platform 51 inches by 63 inches and rising approximately 12 inches above grade.

Brick Foundation Ruin at Cistern No. 3. This ruin, which is associated with a cistern

that supplied water to the construction village during the construction of Fort Pulaski, is significant as an early 19th century example of a utilitarian structure. The structure is a rectangular brick platform (85 inches by 76 inches) rising 24 inches above grade at its highest point and filled with sand. It may have supported a pump or other equipment associated with the cistern.

Cistern No. 7. This cistern, one of several that supplied water to the laborers who lived on-site during the construction of Fort Pulaski, is locally significant as an intact example of a 19th century utility structure. The structure is a large stone, brick, and mortar cistern with pedestal and head. The pedestal is composed of large stones and is approximately 5 feet by 10 feet. The cistern head is an open, rectangular box made of mortared brick and measures approximately 4 feet by 3 feet and is 1 foot high.

Fort Pulaski. Fort Pulaski was a pivotal link in the Third System of U.S. coastal defense. The fort's reduction by new rifled artillery during the Civil War in April 1862 ended the era of impregnable masonry forts. The completed two tier structure is an irregular pentagon that faces east. The circumference of the fort is 1,508 feet and sides of approximately 350 feet surrounded by a wet moat. The walls are 32 feet high and 7 feet to 11 feet thick. The fort contains 64 vaulted casemates and 54 gun mounts on the terreplein. The fort includes two powder magazines and a parade ground about the size of a football field. Local brownish "Savannah Gray" brick is found in the lower walls. The rose red brick is from Baltimore, Maryland, and Alexandria, Virginia. The latter is harder than the "Savannah Grays" so is used in the arches and embrasures.

Moat. The wet moat was part of the original system of fortifications at Fort Pulaski, an important masonry fort of the Third System of U.S. coastal defense. The moat is 32 feet to 48 feet wide and 7 feet deep surrounding Fort Pulaski and its demilune. The moat walls are brick.

Demilune. Part of the original system of fortifications at Fort Pulaski, the demilune was substantially redesigned in 1872 from a flat walled ground to a system of earthen mounds containing magazines. The triangular demilune consists of a network of four magazines, gun emplacements, and connecting passages with oyster shell-imbedded concrete walls protected by the earthen mounds.

John Wesley Memorial. The memorial marks the traditional site of the first American religious service conducted by John Wesley, founder of Methodism. It was erected by the National Society of the Colonial Dames of America in the State of Georgia, an important historic preservation group. The memorial is a 15-foot-high square column with a limestone base, a brick shaft in Flemish bond, and a limestone cap surmounted by a limestone cross, all set on a square of slate tiles. The base, cap, and a limestone plaque on the shaft carry inscriptions.

Lieutenant Robert Rowan Grave Stone. This is the grave of an officer stationed at Fort Greene, an early 19th century fort on the island that is no longer extant. The marker was moved from the site of Fort Greene to its present location. The marker consists of a marble monument (18 inches wide by 26 inches high) with an inscription and a cut top.

Sellmer, Charles Howard, Grave Marker. This is the grave of the infant son of Lieutenant Charles Sellmer and Marion Sellmer, stationed at Fort Pulaski in 1872. The grave has no significant association with the history of Fort Pulaski. The marker consists of a marble monument (10 inches wide by 2 inches deep by 24 inches high) with an inscription.

Cockspur Island Lighthouse. The Cockspur Island Lighthouse sits on an islet at the mouth of the South Channel Savannah River. It is significant for its association with an era of coastal navigation and its embodiment of a specialized architectural

type. The structure originally housed a whale oil lamp; it was converted to a harbor beacon in 1909. Its use was discontinued in 1949. The lighthouse is a tapered brick tube, 16 feet in diameter and 46 feet high, with corbelled brick cornice. There is an exterior brick stair fanlight door at the first landing. An interior spiral brick stair leads to the second landing. A wooden stair leads to the third landing, which supports the iron lantern house. The lighthouse foundation is threatened by years of erosion from storms and the active shipping channel that have lowered the height of the island and removed previous revetment causing the island to be underwater at all times except low tide. This exposes the wooden platform that supports the masonry foundation it sits on to shipworm infestation that can compromise and eventually destroy the platform. This threat is current and loss could occur within a matter of years.

Battery Horace Hambright. This 1895 battery was part of the Endicott or Fourth Seacoast Defense System and was manned during the Spanish-American War. Named for Lt. Horace Hambright, it is representative of U.S. defensive architecture of the period. The battery is a steel-reinforced concrete structure with overall dimensions of 100 feet by 50 feet by 15 feet high. At ground level are three magazines with two gun emplacements above. The battery's north face is covered by a grassed earth berm.

In addition to the foregoing structures from the LCS, the following NPS structures are located in the floodplain.

Visitor Center and Associated Structures. The Fort Pulaski visitor center is a circular brick structure completed in 1964 under the NPS Mission 66 program. Adjoining structures include detached comfort stations, concrete walkways, and a large asphalt parking area.

Maintenance Facility. This facility is associated with the Civilian Conservation Corps era at the monument, though it has since been altered and adapted. Adjoining structures include staff parking and the main monument road.

Tybee Knoll Lighthouse Oil Shed. This historic structure is now a mere brick shell, with roof. It was formerly associated with a lighthouse on the northwest part of Cockspur Island that has long since disappeared. This structure would be stabilized under alternative C of the draft general management plan for Fort Pulaski National Monument.

Visitor Center Annex. This proposed new structure would be designed for monument visitors, school groups, and staff. The specific dimensions, footprint, and other design parameters would be determined in a future planning project. The entire structure would be elevated on pilings above the 100-year floodplain. The annex would be located in close proximity to the existing visitor center.

U.S. Coast Guard Site

The whole of Cockspur Island is federally owned and used by the National Park Service with special use permits for the Savannah bar pilots and the U.S. Coast Guard. A western portion of Cockspur Island was formerly used by the U.S. Navy and is off limits to visitors having been a munitions site. The U.S. Coast Guard currently occupies this site.

The U.S. Coast Guard established a Search and Rescue Station on Cockspur Island on November 17, 1965. The National Park Service issued a special long-term use permit that allowed the U.S. Coast Guard to occupy a 400-foot by 450-foot tract of land on which permanent buildings, concrete-moorings, and communication equipment and antennas were constructed. In 1980, an interagency agreement between the National Park Service and the U.S. Coast Guard authorized administrative jurisdiction over an additional 1.85 acres of land for the Search and Rescue Station as long as it did

not jeopardize or interfere with the area's natural and historic resources. In 1993, the U.S. Coast Guard reconstructed a 75-foot-tall steel aid-to-navigation structure destroyed in a recent storm and originally built in 1978. The U.S. Coast Guard continues these operations at Fort Pulaski National Monument to this day. Generally, the National Park Service views U.S. Coast Guard activities as compatible with monument policy.

Savannah Bar Pilots Site

The Savannah bar pilots and their collective, the Savannah Pilots Association, have roots that trace to the early days of the Colony of Georgia. The State Board of Commissioners of Pilotage at the Port of Savannah currently regulates the bar pilots, who earn their keep by facilitating safe passage to and from the port through the difficult-to-navigate waters of the Savannah River. Individual ships or shipping companies pay the pilots for these services. Cockspur Island provides a convenient location for the Savannah Pilots Association dock and facilities because every commercial vessel entering or leaving the Savannah River must have a pilot on board.

In 1973, the National Park Service issued a 20-year special use permit to the bar pilots to construct, maintain, and use living quarters, a dock, and fuel supply system, and a parking area on its .67-acre lot. With a long-term lease in place, the bar pilots completed renovations. The new dormitory they built stands at the location of the previous Savannah Pilots Association building. The National Park Service renewed the association's special use permit in 1993 and again in 1998.

The last permit renewal expired on December 8, 2008. Based on research and a recent Office of Inspector General report, the legality of continuing to authorize the use by special use permit was then subject to question. The Savannah Bar Pilots wished to continue operating their business out of Fort Pulaski. There were at that time and are not now, any other known locations that would allow the Savannah Bar Pilots to operate more efficiently because of the deep water accessibility and the distance to embarking and disembarking ships that enter and leave the Savannah Harbor. The Bar Pilots have been operating at the current location for more than 70 years with virtually no adverse impact on monument resources, visitor experience, or monument operations. The monument also derives substantial revenue from this operation.

DESCRIPTION OF THE NATURE OF FLOODING AND FLOODPLAIN PROCESSES IN THE AREA

Fort Pulaski and all the structures within the system of dikes and drainage ditches that were constructed between 1830 and 1847 exist within an area that was formerly salt marsh or wetlands for the most part. Prior to 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. It is in these reclaimed areas where structures have been built to serve the National Park Service, the U.S. Coast Guard, and the Savannah Pilots Association.

For the past 100 years, flooding at Cockspur Island has been infrequent. When it has occurred, flooding has been mainly characterized and 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.

The last hurricane to hit the area was Hurricane David in 1979. Prior to that time, the only hurricanes to strike the Savannah

area in the past century or so were major storms in 1940 and 1898. So far as is known, flooding of structures on Cockspur Island as a result of these storms was relatively minor. However, Cockspur Island has historically been subject to intense hurricanes of incredible destructive power. In fact, Fort Pulaski is built on the site of a fort—Fort Green—that was destroyed by the great hurricane of 1824. Cockspur Island will always be subject to major storm surge and flooding if hit by a major hurricane.

In the event of a hurricane, warning times would be adequate for monument visitors and staff to evacuate the island. U.S Highway 80 traverses the monument and provides a readily accessible evacuation route.

JUSTIFICATION FOR USE OF THE FLOODPLAIN

Description of Preferred Alternative and Why Facilities Would Be Retained / Constructed in the Floodplain

Under the preferred alternative in the general management plan, all of the structures currently maintained by the National Park Service, the U.S. Coast Guard, and the Savannah Pilots Association would be retained in their existing locations. The justification for retaining these structures in their existing locations in the 100-year floodplain is as follows:

- The National Park Service is required by law and policy to maintain all historic structures in their present locations. Existing administrative structures (e.g., monument offices, maintenance facility, and visitor center) must remain on the island in order to manage resources effectively and serve visitors. The nearest nonfloodplain site is miles away.
- The emergency services provided at this site by the U.S. Coast Guard Search and Rescue Station are dependent on the station's being located on the Savannah River. The Cockspur Island site provides automobile access to the river that is not otherwise available to U.S. Coast Guard staff.
- The piloting services provided by the Savannah Pilots Association operations facility are essential services, are required by law, and need to originate from a riverside location. The Cockspur Island site provides automobile access to the river that is not otherwise available to Savannah Pilots Association staff.
- Relocating the facilities and services at both sites may be infeasible and very costly, from both a financial cost perspective and from a level/quality of service perspective.
- All sites are located on disturbed ground. Moving the facilities would probably result in adverse impacts and the loss of other natural resource values in the area.
- Both sites have direct access to a major highway (U.S. Highway 80) that provides a quick evacuation route to higher, inland areas.

The preferred alternative also calls for the construction of a visitor center annex in the 100-year floodplain. Since all of Cockspur Island lies within the 100-year floodplain, no alternate locations exist for this facility. The only alternative is not to build the facility at all; however; the monument has a pressing need for a facility of this type in order to provide adequate space for modern exhibits, visitor education, interpretive programs and to accomplish various administrative functions, such as all-employee meetings and training sessions.

DESCRIPTION OF SITE-SPECIFIC FLOOD RISK

The potential for storm surge associated with hurricanes and tropical storms is the primary flood risk for the structures on Cockspur Island. Cockspur Island lies between the north and south branches of the Savannah River. Therefore, if the banks of the Savannah River are overtopped by storm surge, the structures at the site might be flooded from several directions.

The timing and duration of potential flooding at Cockspur Island would vary depending on the intensity of the storm causing water levels to rise. Typically, tropical storms would arise with sufficient advance warning to give persons working on the island hours or days to evacuate.

Because of the site's location at the mouth of the Savannah River, there are notable issues related to surface erosion and sediment deposition that could result from flooding. There could be some sediment and debris deposition at this site as a result of storm surge, and storm surge would probably have the energy to produce detectable erosion or channelization. Hydrologic changes resulting from geomorphic and erosion processes could occur, particularly in the form of channel changes to the north and south branches of the Savannah River.

FLOOD MITIGATION MEASURES

Existing Structures

The highest level of flood mitigation for Cockspur Island would be to relocate the facilities and/or services out of the floodplain, i.e., off of the island. This option is not currently feasible and has several costs associated with it. Thus, this option has not been chosen by the National Park Service. If or when any nonhistoric structures reach their usable lifespan, or if a future flood results in severe damage, then the National Park Service should assess possibilities for relocating the facilities.

The continued use of Cockspur Island would necessitate the development (and future implementation) of an evacuation plan for the site. Given the nature of the flood risks associated with use of the island, the primary flood mitigation measure available to the National Park Service is the early, prompt, and safe evacuation of people working on the site. An evacuation plan would include strategies that ensure proper storm monitoring, emergency communication methods, effective evacuation routes, and timely emergency evacuation notification for staff and visitors.

Because the island is connected by bridge to U.S Highway 80, a convenient evacuation routes is available to staff or visitors on the island. Evacuees could seek higher ground by driving west along U.S. Highway 80 toward Savannah.

The plan would be developed in concert with the protocol and strategy of the existing Chatham County emergency management system and the National Weather Service. This Chatham County emergency management system is already well developed and has proven to be very successful at providing people in the area with advanced warning of potential floods. During past floods, this emergency management system has given warning well in advance of storm activity, leaving ample time for evacuation.

Once the plan is developed, all staff of the monument, the U.S. Coast Guard Search and Rescue Station, and the Savannah Pilots Association operations facility would be informed of the plan's details and their respective implementation responsibilities. Staff at all facilities would also be informed on how to appropriately disseminate evacuation information to visitors who may be at any of the facilities when a flood occurs.

Fuel Storage

Based on the facility design, construction, and operation, the potential for a spill or release of petroleum material to occur as a result of external factors at Fort Pulaski National Monument appears low. Nonetheless, spill response procedures have been developed and incorporated into Fort Pulaski's spill prevention, control, and counter measures (SPCC) plan to allow for easy implementation in the event of an emergency. Furthermore, Fort Pulaski is looking into additional safety measures to employ when there is an anticipated natural disaster (hurricane, tornado, flood, etc.). The Savannah bar pilots currently store 7,200 gallons of fuel on-site and they have an SPCC plan. The U.S. Coast Guard Station Tybee currently stores 7,500 gallons of fuel on-site and they also have an SPCC plan. Both are working to provide a copy of their SPCC plan to Fort Pulaski National Monument.

In the event of an emergency release from their sites, the Savannah Pilots Association and the U.S. Coast Guard Station Tybee would alert the Fort Pulaski superintendent. The chain of command outlined in Fort Pulaski's SPCC would then be activated. Any spill response and mitigation efforts necessary would be covered by the responsible party.

New Structure

The mitigation measures applicable to existing structures on Cockspur Island would also apply to the proposed new visitor center annex. However, the principal mitigation measure for the annex would be to build it above the 100-year floodplain on pilings. Building on pilings would allow storm surge to flow beneath the main structure and minimize impacts to floodplain processes. Furthermore, building on pilings would also serve to limit as much as possible structural damage to the annex.

SUMMARY

The National Park Service has determined that there is no practicable alternative to maintaining the historic and administrative structures currently in use at Fort Pulaski National Monument. Similarly, there is no practicable alternative to the current location of the U.S. Coast Guard Search and Rescue Station or the Savannah Pilots Association operations facility. This determination is primarily based on: (1) the necessity of these facilities remaining in place to fulfill their essential functions, (2) the lack of alternative locations to house the U.S. Coast Guard Search and Rescue Station or the Savannah Pilots Association operations facility; and (3) the notable costs and impacts that would be incurred by moving and/or constructing these facilities in new locations outside the floodplain.

There is no practicable alternative to the proposed location of the visitor center annex.

The primary flood mitigation measure for the U.S. Coast Guard Search and Rescue Station and the Savannah Pilots Association operations facility is to develop an evacuation plan for all facilities at these sites and keep all NPS staff, U.S. Coast Guard staff, and Savannah Pilots Association staff informed of the plan. Although the sites are within areas subject to flooding, there would be ample time to warn staff and visitors using the facilities to evacuate the area. If a flood occurs, visitors and staff could evacuate to higher ground via U.S. Highway 80. These mitigation measures would also apply to the proposed annex. In addition, the new annex would be built on pilings in order to minimally impede water flows and prevent property damage as much as possible.

APPENDIX E: CONSULTATION LETTERS

C H A T H A M C O U N T Y - S A V A N N A H

METROPOLITAN PLANNING COMMISSION

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Thomas L. Thomson, P.E., AICP
Executive Director

www.thempc.org

July 10, 2012

Mr. Randy Wester, Superintendent
Fort Pulaski National Monument
P.O. Box 30757
Savannah, GA 31410-0757

Dear Mr. Wester:

Re: CORE MPO and MPC Comments on Fort Pulaski GMP and Proposed Wilderness Area Boundary

Thank you for notifying us of the public comment period for the Fort Pulaski General Management Plan/Wilderness Boundary/ Environmental Impact Statement. Please see our comments below, regarding transportation and water resources.

The Coastal Region Metropolitan Planning Organization (CORE MPO), a federally mandated transportation planning board staffed by the Chatham County – Savannah Metropolitan Planning Commission (MPC), wishes to ensure that US 80, as a crucial land connection, continues to provide adequate and safe access to and from Tybee Island. Our comments on the transportation aspects of your proposal are as follows:

- In the interest of corridor preservation for US 80, CORE MPO recommends that the Wilderness Area boundary, in sections parallel to US 80, be 50 feet off of the edge of the current US 80 right-of-way. A distance of 50 feet off of right-of-way was described in an earlier draft of the Wilderness Area Study. This boundary description is preferable to the current description (100 feet off of the current centerline) for the reasons stated below.
    - The distance of 100 feet off of the current centerline does not allow enough flexibility for potential adjustments to alignments in future transportation projects, especially since bridge widenings or replacements almost always occur more to one side of an existing bridge than the other, and;
    - In one area, west of Bull River Bridge, the current boundary description would result in the inclusion of a segment of Old US 80/Tybee Road, and thus part of current, public right-of-way, within the Wilderness Area. All existing right-of-way should be preserved for future transportation projects, and not included in the Wilderness Area.

The Wilderness Area boundary should allow for the possibility of some additional land acquisition, and temporary use of land during construction, in future US 80 projects, as the roadway is a vital land connection.

110 EAST STATE STREET, P.O. BOX 8246, SAVANNAH GEORGIA 31412 - 8246 PHONE 912-651-1440 FACSIMILE 912-651-1480

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Mr. Randy Wester, Superintendent
CORE MPO and MPC Comments on Draft GMP and Proposed Wilderness Area Boundary
July 10, 2012
Page 2

- Descriptions of US 80 transportation projects, in several sections of the General Management Plan (GMP), should be updated to reflect awareness of a newer project coming out of our US 80 Bridges Replacement Study. The US 80 Bridges and Road Improvements (PI #0010560) is funded in the MPO's 2035 Long Range Transportation Plan (LRTP) and also has preliminary engineering (including the environmental process) programmed in the MPO's FY 2013-2016 Transportation Improvement Program (TIP). It will be sponsored by the Georgia Department of Transportation. The older project described in the GMP, the "US Highway 80 Expansion Project" (PI #522490), currently is not funded in the MPO's LRTP or in the short-range TIP.

  The US 80 Bridges and Road Improvements project focuses on safety solutions which could be implemented sooner than the previous, larger project. The MPO's study currently proposes that the project consist of ten-foot shoulders on US 80 and on new, two-lane bridge replacements at Bull River and Lazaretto Creek, turn lanes at the Fort Pulaski entrance and at the trailhead parking area, a barrier-separated bicycle-pedestrian path along one side of each bridge, and off-road trail connections to McQueen's Island rail trail, including an eastward extension of the rail trail. (See enclosed diagrams of Alternative 3 or see details and comparison of all alternatives at: http://www.thempc.org/Transportation/US80BridgesStudy_Participation.html.) An adequate increase in elevation would be accomplished during the project through substantial resurfacing. This concept is still preliminary and thus the final alignment is not certain.

  Although the currently funded US 80 project would have fewer acres of environmental impact than the previous four-lane widening concept, that fact does not reduce the importance of our first comment regarding the Wilderness Area boundary. At the Bull River Bridge, the currently planned project likely would extend farther from the current centerline than the previous widening concept would have, although final alignment is unknown.

- We support the proposal in all of the GMP alternatives to extend the McQueen's Island Trail eastward to Tybee Island. As mentioned above, the MPO's US 80 Bridges Study proposes this extension as well as a barrier-separated path along a new bridge at Lazaretto Creek. The existing trail and the future extension also are currently proposed for the bicycle and pedestrian network in the MPO's Non-motorized Transportation Plan, expected to be adopted later this year.

Regarding any potential construction projects or land disturbing activities resulting from the GMP (visitor center, relocated parking lot), MPC provides the following comments for water resource protection:

- Stormwater low impact development (LID) mechanisms such as grassy bioretention swales, tree islands, and parking lot curb cuts leading to gardens areas, should be incorporated into the engineering and development of the sites to provide viable mechanisms for managing and filtering stormwater produced on site. Upon implementing LID practices, the high percentage of impervious surface coverage at completion as well as any impact to nearby water bodies will be dramatically lessened.

- Where feasible, pervious/permeable paving should be used throughout to diminish the amount of petroleum, oils, and lubricants (POLs) running off of the parking lot's pavement via sheet flow into the nearby wetlands and marshes and to prevent the deterioration of water quality.

- All land disturbing activities associated with the construction should be conducted in accordance with best management practices (BMPs) detailed in the Georgia Erosion and Sedimentation

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Control Act of 1975, as amended (O.C.G.A. 12-7-1) as well as the *Coastal Stormwater Supplement (CSS) to the Georgia Stormwater Management Manual (GSMM).*

- If wetlands are impacted during any portions of the project and credits are required to be purchased from a mitigation bank, it is suggested that those credits be purchased from a bank that is located in the same watershed as the one being impacted.

- The Savannah River that is adjacent to the proposed site is a listed as impaired by the U.S. Environmental Protection Agency (EPA) and has a total maximum daily load (TMDL) for dissolved oxygen. Practices to ensure the protection and prevention of contaminants from ultimately entering the river should be instituted at all costs.

- Once construction is complete, please refer to the *Chatham County Comprehensive Water Supply Management Plan* for watering regulations and best management practices (BMPs).

Again thank you for including us in your coordination efforts on the GMP. If you have any questions about our comments, you may reach me at 912-651-1446. We also would welcome the opportunity to meet with you for further discussion of the US 80 Bridges Replacement Study. The MPO and the Georgia Department of Transportation will continue to include you in coordination efforts of the US 80 Bridges and Road Improvements project coming out of the study.

Sincerely,

Thomas L. Thomson, P.E., AICP
Executive Director

TLT/jal

Enclosures

cc: Sen. Saxby Chambliss, R-Ga.
Sen. Johnny Isakson, R-Ga.
Rep. Jack Kingston, Georgia Congressional District 1
Pete Liakakis, Chairman of CORE MPO and Chatham County Commission
Pat Farrell, Chatham County Commissioner
Jason Buelterman, Mayor of Tybee Island
Diane Schleicher, Tybee Island City Manager
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David Moyer, GDOT Office of Program Delivery
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CONSERVANCY

July 9, 2012

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VIA Electronic Submission &
Fort Pulaski National Monument – GMP
National Park Service
Southeast Regional Office
Planning & Compliance Division
100 Alabama St., 1924 BLDG
Atlanta, GA 30303

RE: Fort Pulaski General Management Plan

To Whom It May Concern:

We appreciate this opportunity to comment on the Fort Pulaski General Management Plan ("The Plan"). The Plan, which is intended to establish and articulate a management philosophy and framework for decisions making and problem solving, has several key purposes: 1) to determine the most beneficial use of the land and structures associated with the historic value of Fort Pulaski, 2) to create a plan for the future enhancement of the National Monument and its cultural/historical value, and 3) to preserve the surrounding tidal marshlands and natural resources of the park. Decisions based on this Plan will impact Fort Pulaski and accompanying marshlands on McQueens and Cockspur Islands (collectively, the "Park") for twenty or more years and must comply with the requirement that management of the National Parks, "shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in degradation of the values and purposes for which these various areas have been established." 16 USC § 1a–1, National Park System.

The Georgia Conservancy has a tradition of advocating for the protection of Georgia's valuable habitats and concerning itself with "all factors which will enhance or detract from, preserve or destroy the quality of Georgia's environment." (1970 Georgia Conservancy Statement of Purpose). Beginning with Kerr-McGee in 1968 and the Coastal Marshlands Protection Act of 1969, the Georgia Conservancy has been releasing comments in support of both wetland and marshland protection for over forty years. In response to the National Park Service's ("NPS") request for comments, the Georgia Conservancy submits these comments to express support for Alternative B, the NPS's preferred alternative.

The Wilderness Act of 1964 defines "Wilderness" as "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain." 16 U.S.C. § 1131. The Plan proposes to submit 4,500 acres of

pristine salt marsh on McQueens Island to Congress for approval as National Wilderness Area. The Wilderness Act also states that designated lands, "shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character." 16 U.S.C. § 1131. McQueens Island is rich with rare pristine salt marsh habitats. The draft General Management Plan itself states, "The importance of this marsh to the region's natural resources is high and will continue to grow as fisheries and bird habitat become more threatened." Pristine salt marshes are rich and diverse ecosystems that are critically important to both the health of the coastal environment as well as Georgia's coastal economy. The marsh on McQueens Island is not only a nursery for many species of juvenile fish and shellfish, but also provides habitat for several threatened and endangered species such as diamondback terrapin, manatee and wood stork. The water quality is ideal for supporting recreational oyster harvesting and provides valuable opportunities for eco-tourism. We strongly support any plan that calls for the preservation of untouched marshland habitat so that it may flourish and in its natural and primitive state.

Over the next twenty years, climate change will have an effect on Park management. The Plan recognizes the immediate and unique vulnerability that coastal environments face with regard to climate change, particularly sea level rise, and recommends the topic be "retained for analysis." The rising sea level and resulting alteration of the marsh, coupled with the likely dredging of the Savannah River, only underscores the wetland vulnerability and likelihood of habitat conversion. While we understand the topic is complex, we strongly encourage the development and implementation of a proactive climate change strategy that maximizes the protection of priority habitat.

Again we thank you for the opportunity to submit these comments to express our support for Alternative B. By adopting this Plan, the NPS will further its goal to protect the salt marsh of McQueens Island as a National Wilderness Area. We are encouraged by this effort and look forward to supporting future efforts to protect our rare and valuable marshlands in their natural state.

Sincerely,

Pierre Howard
President

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
COASTAL RESOURCES DIVISION

MARK WILLIAMS
COMMISSIONER

A.G. 'SPUD' WOODWARD
DIRECTOR

July 19, 2012

Mr. Randy Wester, Superintendent
USDOI, National Park Service
Fort Pulaski National Monument
P.O. Box 30757
Savannah, Georgia 31419

RE: Consistency Determination for Fort Pulaski National Monument DGMP, Wilderness Study, and EIS, Chatham County, Georgia

Dear Mr. Wester:

Staff of the Coastal Management Program has reviewed your May 10, 2012 letter and Draft General Management Plan (DGMP) for the Fort Pulaski National Monument. The 20-year Plan's Preferred Alternative (Alternative B) proposes to manage the Fort with a focus on the April 1862 period of significance in terms of the landscape and interpretive programs and includes landscape restoration and interpretation of the construction village.

The Plan states that the management of populations of exotic plant and animal species, up to and including eradication, would be undertaken wherever such species threaten monument resources or public health and when control is prudent and feasible. We encourage you to take a proactive stance on exotic species control by reporting occurrences of invasive species to the Early Detection and Distribution Mapping System (www.eddmaps.com) developed by the Center for Invasive Species and Ecosystem Health at the University of Georgia.

The Program concurs with your consistency determination. This determination ensures that the proposed project has been designed to comply to the maximum extent practicable with the applicable enforceable policies of the Georgia Coastal Management Program. Please feel free to contact Kelie Moore or me if we can be of further assistance.

Sincerely,

B. Gane

Brad Gane
Ecological Services Section Chief

cc: GaDNR/WRD/Nongame Program

File# (06022001_1201PM.0719212.FC GMP)

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October 12, 2012

Mr. Randy Webster
National Park Service
Fort Pulaski National Monument
Post Office Box 30757
Savannah, Georgia 31419

Re: USFWS File Number 2012-0679

Dear Mr. Webster:

The U. S. Fish and Wildlife Service (Service) thanks you for the opportunity to review and comment on the Draft General Management Plan, Wilderness Study and Environmental Impact Statement (EIS) for Fort Pulaski National Monument, Chatham County, Georgia. We have reviewed your draft plan plus EIS and provide comments in accordance with provisions of the Endangered Species Act (ESA) of 1973, as amended; (16 U.S.C. 1531 *et seq.*), to further the conservation of fish and wildlife resources and their habitats, including federally listed threatened and endangered species.

You provided three Alternatives (A, B and C) for general management of Fort Pulaski National Monument. Your preferred alternative is B. With this alternative you would focus on the April 1862 period of significance in terms of the landscape and interpretive programs. This alternative includes landscape restoration and interpretation of the construction village. Although, the Service would support any of the three alternatives as viable to your operations, we have focused on alternative B because this is your preferred course of action.

The National Park Service has determined that any actions under these Alternatives (A, B, or C) "are not likely to adversely affect any federally threatened or endangered species." We concur with your determination based solely on the actions of alternative B. In view of this, we believe that the requirements of section 7 of the ESA have been satisfied. However, obligations under

section 7 of the ESA must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner which was not previously considered in this assessment; or (3) a new species is listed or critical habitat determined that may be affected by the identified action.

If you have any additional questions, please write or call our Coastal Georgia Sub Office supervisor, Strant Colwell, at 912-832-8739.

Sincerely,

Strant Colwell

Sandra S. Tucker for
Field Supervisor

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
HISTORIC PRESERVATION DIVISION

MARK WILLIAMS
COMMISSIONER

DR. DAVID CRASS
DIVISION DIRECTOR

June 15, 2012

Fort Pulaski National Monument-GMP
Attn: David Libman
National Park Service, Southeast Regional Office
100 Alabama Street, 1924 BLDG
Atlanta, Georgia 30303

RE: Fort Pulaski National Monument: General Management Plan
Chatham County, Georgia
FP-031218-001

Dear Mr. Libman:

The Historic Preservation Division (HPD) has received the draft General Management Plan (GNP), Wilderness Study, and Environmental Impact Statement (EIS) for Fort Pulaski National Monument. Our comments are offered to assist the National Park Service (NPS) in complying with provisions of Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA).

Based on the information provided in the GNP and EIS, it appears that both alternatives B (NPS' preferred alternative) and C have the potential to affect historic and archaeological properties as they are implemented. We look forward to receiving Section 106 documentation for properties as part of the implementation of the GNP.

Regarding the draft GNP, please note that we have an update of Georgia's statewide historic preservation plan, which should be referenced on page 25. For your information, the updated plan, *Georgia's State Historic Preservation Plan 2012-2016: Partnering for Preservation* is available in the Preservation Planning section of our website at http://www.georgiashpo.org/community/planning. Also, with regards to alternatives B (preferred alternative) and C, it appears that they have very similar projected implementation costs, and effects to historic properties. Alternative C appears to provide both the opportunity for NPS to focus on the interpretation of the 1852 historic events and cultural landscape while also providing for a wider interpretation of the historical development of Fort Pulaski, and its natural and ecological setting.

We look forward to working with the NPS on Section 106 consultation as the GNP is implemented. Please feel free to contact Elizabeth Shirk, Environmental Review Coordinator at (404)651-6624, or myself at (404)651-6461 if you have any questions about our comments.

Sincerely,

Karen Anderson-Cordova, Program Manager
Environmental Review & Preservation Planning

KAC

Cc: Tommy Jones, NPS

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July 9, 2012

Mr. David Libman
Fort Pulaski National Monument – GMP
National Park Service
Southeast Regional Office
Planning and Compliance Division
100 Alabama St., 1924 BLDG
Atlanta, GA 30303

SUBJECT: EPA Comments on the Draft Environmental Impact Statement (DEIS) for the Fort Pulaski National Monument, Draft General Management Plan, Wilderness Study and Environmental Impact Statement
Savannah, Chatham County, Georgia
CEQ #: 20120139; ERP #: NPS-E61081-GA

Dear Mr. Libman:

The U.S. Environmental Protection Agency (EPA) has reviewed the referenced Draft Environmental Impact Statement (DEIS) in accordance with its responsibilities under Section 309 of the Clean Air Act and Section 102(2)(C) of the National Environmental Policy Act (NEPA). The National Park Service (NPS) proposes changes to General Management Plan for the Fort Pulaski National Monument. The purpose of the DEIS is to provide a comprehensive management plan that helps the NPS fulfill the national monument purpose, maintain its significance, and protect its resources for present and future generations. The DEIS also includes a wilderness study that evaluated options for designating wilderness areas at Fort Pulaski,

Fort Pulaski is located between Savannah and Tybee Island on the Georgia coast. The site contains 5,365 acres on Cockspur and McQueens islands. The Fort was declared a national monument on October 15th, 1924, under the authority of Section 2 of the Antiquities Act. In 1936, Fort Pulaski was expanded to include all lands on Cockspur Island, and donated lands, easements and improvements on McQueens and Tybee islands. According to the DEIS, the Fort was built to help "protect the eastern seaboard cities after the British burned the city of Washington during the War of 1812." In 1862, "the bombardment of Fort Pulaski by rifled cannons during the Civil War resulted in the breach of its "invincible" walls and the surrender of its garrison to Union forces (pg 3)."

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The DEIS examines three alternatives for managing Fort Pulaski for the next 20 years. It analyzes the impacts of implementing each of the alternatives. Alternative A is the "no action" alternative that continues current park management strategies and serves as a basis for comparison in evaluating the other alternatives. Alternative B is the NPS's preferred alternative that emphasizes the restoration of the cultural landscape of Cockspur Island similar to the 1862 period of significance. This alternative involves tree removal and relocating the visitor parking lot to an area not visible from the terreplein (gun deck) of the Fort. Alternative C emphasizes a wider range of interpretive themes including natural resources and historic periods. This alternative places less emphasis on historic landscape restoration and views. Both "action" alternatives include a proposal to construct a new visitor's center annexes that will be described in a future planning project.

EPA notes that the DEIS discusses the decision-making process known as "Choosing by Advantages" that was used to select the preferred alternative. The scores resulting from the process were similar for Alternative B and C; however, Alternative B would restore the 1862 viewshed, protect cultural resources like the veterans cemetery, remove more exotic and invasive species and provide better interpretation opportunities due to the proposed restoration of most historic site conditions and views. Alternative B would also impact more trees which the DEIS indicates would be mitigated. Therefore, EPA recommends that the FEIS include more details regarding proposed tree loss and mitigation. For example, the FEIS should denote approximately how much more vegetation or tree loss may be impacted by Alternative B compared to C and describe potential mitigation in terms of tree replacement ratios, replacement species/types of trees or consistency with any tree replacement guidelines, etc.

The DEIS discusses the NPS's efforts to comply with the Endangered Species Act and Section 106 of the National Historic Preservation Act. According to the DEIS, the NPS has informally coordinated with the U.S. Fish and Wildlife Service on threatened and endangered species and the Georgia Historic Preservation Division on historic properties. While the NPS describes various coordination efforts, the FEIS should document resource agency formal consultations including concurrence with the NPS's determination that the proposed project is not likely to adversely affect any federally threatened or endangered species and Section 106 determinations regarding the relocation of the parking area for the Mission 66 visitor center.

The NPS conducted a wilderness study for Fort Pulaski related to lands that were previously found eligible for wilderness designation. Based on a wilderness eligibility assessment, approximately 4,500 acres of tidal salt marsh at McQueen's island was found eligible. Both action alternatives propose the same amount of acreage for designation as part of the National Wilderness Preservation System. EPA supports the preservation and restoration of the salt marsh areas at Fort Pulaski as proposed by the NPS. This designation would help to preserve and protect the natural state of the salt marsh, and provide for "compatible recreational opportunities, education, and scientific study."

Again, EPA supports the preservation and restoration of 4,500 acres of salt marsh at Fort Pulaski. We appreciate the NPS balancing visitor experience needs and enhancing recreational opportunity with the need to protect sensitive cultural and ecological resources. We understand that Alternative B balances those needs; and based on our DEIS review, EPA rates this document "LO" (Lack of Objections). Attached is a summary of definitions for EPA ratings.

We appreciate the opportunity to review the proposed action. If we can be of further assistance, please feel free to contact Ntale Kajumba at (404) 562-9620 or kajumba.ntale@epa.gov.

Sincerely,

Heinz J. Mueller, Chief
NEPA Program Office
Office of Policy and Management

National Parks Conservation Association®
Protecting Our National Parks for Future Generations®

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July 13, 2012

Fort Pulaski National Monument GMP
ATTN: David Libman
National Park Service, Southeast Regional Office
100 Alabama Street
1924 BLDG
Atlanta GA 303003

Dear Mr. Libman,

On behalf of National Parks Conservation Association (NPCA) and our 6,471members in Georgia and 600,000members and activists nationwide, thank you for the opportunity to comment on the Draft Management Plan (GMP), Wilderness Study, and Environmental Impact Statement for Fort Pulaski National Monument.

Given the authorizing legislation's foundation, and the purpose of Fort Pulaski National Monument to preserve and protect the 19th century masonry fort and associated structures and interpret its role in coastal fortifications, NPCA supports the park service's preferred Alternative B (with two exceptions noted below), which primarily relocates the visitor parking lot to enhance the view shed for purposes of interpretation.

NPCA supports the inclusion in the final plan of 2 key points in Alternative C:

1. Alternative C, like Alternative B recommends that vegetation should be removed to better understand the sight lines during the historic battle (from the Union batteries at Goat Point to Fort Pulaski); however Alternative C removes less vegetation. Given costs constraints and the threat of invasive species, the sight lines proposed in Alternative C may be more efficient to maintain while still providing important interpretive understanding for park visitors.

2. Alternative C also calls for an expansion of recreational access by expanding the trail system and launching facilities for canoes and kayaks at Lazaretto Creek. The Georgia Coast Salt Water Travel Trail could benefit from improved launching facilities. Ft. Pulaski is also part of the Metropolitan Statistical Area of Savannah. The NPS Call to Action theme 'Connecting People to Parks' speaks to connecting urban communities to parks through trails, waterways and community green spaces and expanding the use of parks for healthy outdoor recreation. We believe this element from Alternative C would help accomplish that important goal.

In 2007 NPCA conducted a State of the Parks Assessment at Fort Pulaski National Monument. Key findings indicted the need for additional research on the history of Fort Pulaski and Cockspur Island beyond the Civil War to expand understanding of park

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resources and add to interpretive programs. Topics in need of further study include American Indian habitation, the construction of Fort Pulaski and the fort's role in the Underground Railroad.

Page 17, line 34-45 of the Draft GMP references Representative Jessie Jackson's language, inserted into FY 2000 NPS appropriations bill, directing the Secretary of Interior to encourage NPS managers of Civil War battle sites to recognize and include…the unique role that the institution of slavery played in causing the civil war and it's role … at the individual site. We agree.

In Table 7, Summary of Impacts, Alternative B indicates that funding will be sought for archeological studies to provide information about the construction village that was necessary to recreate part of the cultural landscape… and prepare exhibits. NPCA suggests that perhaps additional research and interpretation could also deepen our understanding of the role of slavery and the Underground Railroad at Fort Pulaski.

NPCA supports the Park Service's proposed Wilderness Study to evaluate options for designating wilderness and developing a formal wilderness proposal. Of concern is the traditional use of motor boats in the tidal Creeks of McQueen's Island. Although the Wilderness Act allows the continuation of traditional uses when those uses have been established, it is inherent in the definition of wilderness that there are outstanding opportunities for solitude and a primitive unconfined type of recreation. NPCA supports the park service's management of these areas in such a way as to preserve their wilderness characteristics to the maximum extent possible.

Thank you for the opportunity to submit these comments.

Respectfully

Emily A. Jones
Sr. Program Manager, Southeast Region

cc: Superintendent Randy Webster
Don Barger, Senior Director, NPCA Southeast Region
Alan Spears, NPCA Legislative Representative

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NPS 348/106627
June 2013

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