

## **CHAPTER 1 PURPOSE AND NEED**

### **INTRODUCTION**

This environmental assessment presents the No Action Alternative and the Preferred Alternative for the stabilization of the historic seawall at the Castillo de San Marcos National Monument in St. Augustine, Florida. The document also identifies the effects of implementing the No Action Alternative and the Preferred Alternative on the natural, social, and physical environment.

### **PROJECT LOCATION**

Castillo de San Marcos National Monument is located on Matanzas Bay at the mouth of the Matanzas River in the northeastern portion of downtown St. Augustine, Florida (Figure 1). The Castillo de San Marcos National Monument (hereafter referred to as “park”) consists of an historic fort on a site of approximately 20.5 acres. The park is located on the mainland across the Matanzas River from Anastasia Island. The St. Augustine Inlet provides access from the Atlantic Ocean to Matanzas Bay and to the Matanzas River to the south of the park. The park is bounded by the Matanzas River to the east, South Castillo Drive to the west and south, and private property to the north.

### **PURPOSE OF AND NEED FOR THE PROPOSED ACTION**

#### **Purpose**

The National Park Service is considering stabilization of the existing historic seawall that protects the Castillo de San Marcos National Monument from the waters of Matanzas River and the Atlantic Ocean. Castillo de San Marcos is located on the Matanzas River in downtown St. Augustine, Florida. The historic seawall is a portion of a more extensive seawall system that helps to protect the city of St. Augustine from soil erosion, and also provides some protection from high tides, hurricanes, and storm surges along the Atlantic Ocean coast. Flood protection is limited as the seawall is linear along a north-south axis and floodwaters can go around the north and south ends of the seawall and enter the city, limited only by ground elevation. The city of St. Augustine seawall extends from the Florida National Guard Headquarters to just north of Castillo de San Marcos, a distance of approximately 4,700 feet.

The seawall at the Castillo de San Marcos National Monument, constructed in the mid 19<sup>th</sup> century, is an historic structure that was originally constructed to protect the Castillo de San Marcos and surrounding property. The seawall has protected the fort for over 160 years, but is beginning to fail. Failure of the seawall would pose a serious threat to the integrity of the oldest fortification in the continental United States. The purpose of the proposed project is to rehabilitate this historic seawall, which provides protection for the structures and landscape of Castillo de San Marcos.

#### **Need**

Castillo de San Marcos was originally constructed by the Spanish between 1672 and 1695. The original seawall, constructed in the 1600’s, was substantially reconstructed by the



Army Corps of Engineers between 1833 and 1844. The seventeenth century seawall was built approximately half the height as the nineteenth century seawall. The seawall was constructed with coquina, a sedimentary rock from the limestone family associated with marine reefs. Tabby was utilized as a cement to bond the coquina stones together. Tabby is a form of cement comprised of lime, crushed oyster shells, sand, and water. In addition, a granite cap was installed above the high water line. Over time, cracks have developed in the coquina seawall.

In April 2004, archaeologists conducted investigations at the park and determined that the soil on the landward side of the wall is eroding due to sea water from the Matanzas River penetrating the seawall during high tide and carrying soil seaward when the tide recedes. This scouring action resulted in the adjacent sidewalk sinking due to erosion underneath the sidewalk.

The seawall at the park is at the northern limits of a continuing seawall that separates the city of St. Augustine from the Matanzas River. The Matanzas River is a tidal body of water near the St. Augustine Inlet to the Atlantic Ocean. Seawall failure could increase the soil erosion at the park and could increase the potential for flooding conditions in the national monument parking lot and downtown St. Augustine. However, the seawall at the park and in St. Augustine is not designed to protect the park or the city from flooding. As mentioned, the 4,700 foot long seawall is constructed on a north-south axis and flood waters can go around the ends of the seawall to flood the city and the park. The primary purpose of the seawall as constructed is protection against soil erosion.

This environmental assessment analyzes seawall conditions within park boundaries, describes available alternatives for seawall stabilization, and assesses the effects of each alternative on the environment.

This environmental assessment has been prepared in accordance with the National Environmental Policy Act of 1969 and implementing regulations, 40 Code of Federal Regulations Parts 1500-1508; National Park Service Director's Order #12 and Handbook, Conservation Planning, Environmental Impact Analysis, and Decision-Making; and Section 106 of the National Historic Preservation Act of 1966 as amended, and implementing regulations, 36 Code of Federal Regulations Part 800. The intent of this document is to comply with the requirements of Section 106 of the National Historic Preservation Act of 1969, as amended (36 Code of Federal Regulations, Part 800.8).

## **PURPOSE AND SIGNIFICANCE OF THE PARK**

The park was originally established as Fort Marion National Monument by Presidential Proclamation No. 1713 (43 Stat. 1968) on October 15, 1924. The United States War Department administered the site until it was transferred to the Department of the Interior, National Park Service, by Executive Orders No. 6166 of June 10, 1933 and No. 6228 of July 28, 1933. Congress restored the Spanish name, Castillo de San Marcos, to the park on June 5, 1942 (56 Stat. 312).

The Castillo de San Marcos is the oldest remaining European fortification in the continental United States. It was built just over one hundred years after the founding of St. Augustine by the Spanish in 1565. The fort stands as a reminder of the battles among European powers for control of North America. Its bastioned design represents the conventions of military architecture and technology of its day.

Built between 1672 and 1695, the fort served primarily as an outpost of the Spanish Empire. It guarded St. Augustine, the first permanent European settlement in the continental United States, and protected the sea route for treasure ships returning to Spain. Although the fort has served several nations throughout its history, it has never been taken by military force. During the 18th century, the fort went from Spanish control to British and back to the Spanish, who remained in power in Florida until the area was purchased by the United States in 1821. In 1825, the United States War Department changed the name of Castillo de San Marcos to Fort Marion in honor of American Revolutionary War General Francis Marion. Confederate forces occupied Fort Marion between January of 1861 and March of 1862 when it was reoccupied by forces of the United States for the duration of the Civil War. Fort Marion was also used as a prison for members of the Cheyenne, Kiowa, Comanche, Caddo and Arapaho tribes during the 1870s and 1880s as western migration of settlers resulted in conflicts over land and resources and ultimately led to removal of the native peoples from their homelands by the United States Army.

In colonial times, the fort sat at the northern edge of the city of St. Augustine where it commanded the land and sea routes leading to the settlement. The early seawall that was constructed along the Matanzas River was built at approximately half the height of the nineteenth century seawall. Low elevation lands were filled in behind the seawall and those properties were developed.

The fort and its associated structures were also a significant part of the development of tourism in St. Augustine, and their preservation marks early commitment by the U. S. government to the preservation of historic structures under its management.

## **PROJECT BACKGROUND**

The seawall system protecting the park is part of a seawall system that protects the city of St. Augustine, Florida. The overall length of the city seawall is approximately 4,700 feet. Approximately 3,400 feet of the city system is owned by the city of St. Augustine and is located to the south of the park. The city seawall system ends just to the north of the northern boundary of the park. Approximately 1,350 feet of the seawall is owned by the National Park Service and protects the park. The existing seawall at the park ranges in height from 6 to 7-1/2 feet above mean sea level. The height of the portion of the seawall that is to be rehabilitated is approximately 6 to 6-1/2 feet above mean sea level.

As previously mentioned, this seawall system was constructed in the middle of the 19<sup>th</sup> century. The seawall is a substantial structure. The coquina stone and tabby wall is approximately 6 to 7 feet tall and approximately 6 feet wide at its base. The cross section of the wall becomes progressively narrower from bottom to top, and eventually is approximately 3 feet wide at the granite cap. The wall is supported by a coquina stone foundation that is 2 feet thick and 7 feet wide. However, tides in the Matanzas River fluctuate considerably more than typical Florida waters. The tidal shifts in the Matanzas River generally range from a low of -2.274 feet (Mean Low Water elevation) to a high of +2.336 feet (Mean High Water elevation) creating an average tidal shift of more than 4.6 feet (J2 Engineering, Inc., 2004). As the base of the seawall is located at approximately -1.5 foot elevation and the top of the seawall is at approximately +5.6 to +6.36 feet elevation, the seawall at the park can be completely dry during a low tide and then have water halfway up the wall during a high tide. This tidal fluctuation results in strong

currents through the Matanzas River which increases the erosion on the active side of the damaged seawall. Storm events could create higher tides and an even heavier tidal flow.

Due to damage from storms and tidal action over the last 160 years, a large portion of the historic seawall has been reconstructed at different points of time. For example, the widening of Bay Street (now Avenida Menendez) between 1957 and 1959 resulted in the removal of the historic seawall between the park and the Bridge of Lions. The portion of the historic seawall that remains is buried beneath the street's median. The only sections of the historic seawall still exposed are the sections by the fort and the section between the Santa Maria Restaurant and the Florida National Guard property at the intersection of Avenida Menendez and Saint Francis Street. The city plans to rehabilitate this section of the seawall by constructing a second seawall approximately 11 feet seaward of the historic seawall. A promenade would be created by placing fill in the void and surfacing with coquina pavers. Only the top of the historic seawall would be above ground, and this would serve as seating.

Most of the park's seawall is in fair condition, but two sections of the seawall are failing. The southernmost 243 feet of the seawall and 70 feet of the seawall near the northeast corner of the fort contain large cracks that allow water to penetrate the wall and erode the soil on the landward (active) side of the seawall. In recent years, this erosion resulted in the sinking of the sidewalk that lies adjacent to the southern section of the seawall. It was visually apparent that the southernmost section of seawall had been displaced and the park was concerned that further movement and damage was possible.

In 2004, an engineering firm was contracted to evaluate the condition of the historic seawall in the southern portion of the park (J2 Engineering, Inc., 2004). Geotechnical studies were performed as part of the evaluation. Soil borings were conducted at a depth of 30 to 50 feet and a general soil profile was prepared. The soil on the active side of the seawall was excavated in one location to determine the dimensions, construction, and condition of the wall. The seawall cross section described previously was confirmed. As the tides shifted throughout the day, workers observed seawater penetrating the wall and transporting soil from the active side of the wall through the cracks and into the Matanzas River. The engineers analyzed the capability of the wall to withstand additional pressure from the active side. The active side of a seawall or any retaining wall is the side that supports the soil. The passive side of the seawall is the seaward side of the wall. Seawalls often fail when water pressure from rain or high tides that saturate the soil on the active side of the wall topples the wall by pushing it seaward. The tests indicated that the seawall did not achieve an adequate factor of safety with a minimal surcharge of 100 pounds per square foot.

The engineers suggested that actions should be taken to reduce the potential for surcharge to be applied on the active side of the wall. Possible solutions recommended include:

- Implementation of the city proposal (second seawall and promenade) through the southern portion of the park.
- Placement of fill on the passive (seaward) side of the seawall.

- Construction of a drainage system to relieve hydraulic pressures on the active side of the wall.
- Excavation and construction of a bulkhead on the active side of the seawall to reduce hydraulic pressures on the wall.

## SCOPING

The Council on Environmental Quality (CEQ 1978) guidelines for implementing the National Environmental Policy Act and the National Park Service National Environmental Policy Act guidelines contained in *Director's Order # 12: Conservation Planning, Environmental Impact Analysis and Decision Making Handbook* (National Park Service, 2001b) require scoping. Scoping is an early and open process completed by the National Park Service to:

- Determine important issues.
- Eliminate issues that are not important or relevant.
- Identify relationships to other planning efforts or documents.
- Define a time schedule of document preparation and decision-making.
- Define purpose and need, agency objectives and constraints, and the range of alternatives.

There are two types of scoping – internal and external. Internal scoping is conducted by the National Park Service to determine the types of issues that might be associated with a proposed project, and forms the basis for the assessment of the effects of the alternatives. Internal scoping involves analyzing the characteristics of construction and operation, and relating these proposed actions to potential environmental effects. External scoping involves early public involvement and can include letters to involved agencies, stakeholder meetings, informal public meetings or open houses, formal public hearings, and newsletters. Scoping letters to the agencies are required for every environmental assessment prepared by the National Park Service. The other forms of external scoping are used in varying degree, depending on the nature of the issues involved for a particular project. The amount of external scoping is determined primarily by the degree of the potential for adverse environmental effects of a proposed project.

The scoping activities the National Park Service conducted are described in the paragraphs that follow.

An internal scoping meeting was held on July 13, 2006 at the park headquarters in St. Augustine to discuss the potential issues surrounding alternatives for stabilization of the historic seawall that protects the historic fort. The planning team determined that two alternatives would be evaluated. One alternative would be the installation of riprap to the seaward side of two sections of seawall in the park. Riprap would be installed along approximately 243 feet of the southernmost section of the seawall at the park and also along approximately 70 feet of seawall near the northeast corner of the fort. Another alternative would be to implement the city of St. Augustine proposal that included the construction of a second seawall approximately 11 feet seaward of the historic seawall, filling the void between the seawalls with soil, and constructing a promenade on top of the fill. As a large portion of the historic seawall would be covered with soil, this

alternative was anticipated to have greater cultural feature impacts than the riprap alternative.

Coordination letters were sent to federal, state and local agencies on August 29, 2006, advising them of the seawall stabilization project, describing the alternatives, and asking for their comments regarding the alternatives or potential impacts of the alternative early in the planning process. Letters were sent to the following agencies:

- National Marine Fisheries Services
- National Oceanic and Atmospheric Administration
- Florida Fish and Wildlife Conservation Commission
- St. Johns Water Management District
- Florida State Clearinghouse, Environmental Protection Agency
- Advisory Council on Historic Preservation
- U.S. Army Corp of Engineers
- Federal Emergency Management Agency
- U.S. Coast Guard
- Northeast Florida Regional Planning Council
- US Fish and Wildlife Service
- Florida Park Service
- Florida State Historic Preservation Officer

Coordination letters were sent to Indian tribes on August 29, 2006, advising them of the seawall stabilization project, describing the alternatives, and asking for their comments regarding the alternatives or potential impacts of the alternative early in the planning process. Letters were sent to:

- Alabama-Coushatta Tribes of Texas
- Alabama-Quassarte Tribal Town
- Apache Tribe of Oklahoma
- Arapaho Business Committee
- Caddo Nation of Oklahoma
- Cheyenne-Arapaho Tribes of Oklahoma
- Chickasaw Nation
- Comanche Nation
- Coushatta Indian Tribe
- Fort Sill Apache Tribe of Oklahoma
- Jicarilla Apache Nation
- Kialegee Tribal Town

- Kiowa Indian Tribe of Oklahoma
- Mescalero Apache Tribe
- Miccosukee Indian Tribe
- Muscogee (Creek) Nation
- Northern Cheyenne Tribal Council
- Poarch Band of Creek Indians
- San Carlos Tribal Council
- Seminole Nation of Oklahoma
- Seminole Indian Tribe
- Thlopthlocco Tribal Town
- Tonto Apache Tribal Council
- Tonto Apache Reservation #30
- White Mountain Apache Tribal Council
- Yavapai-Apache Community Council

Examples of letters to the State Historic Preservation Office, to other agencies, and to the tribes are included in Appendix A.

A newsletter was prepared and distributed in August 2006 that summarized the purpose and need of the project and described the alternatives. The newsletter was posted on the park website and was also mailed to stakeholders. The newsletter included a form that interested parties could complete and send to the park with their comments or concerns.

Together, all of these scoping activities assure that potential issues and concerns associated with the stabilization of the historic seawall project have been identified and included in this environmental assessment.

## **ISSUES AND IMPACT TOPICS**

Potential issues and concerns affecting the proposed action were identified based on the specific design and operational features of each facility. Issues and concerns affecting this proposal were identified from past National Park Service planning efforts and by input from park staff; local, state and federal agencies; local and regional organizations; and the public. The major issues and concerns include potential effects on or from the following:

- historic seawall
- other historic features at the park
- marine resources
- viewshed
- soil erosion



Resources of concern that could be affected by the range of alternatives are defined in the National Park Service National Environmental Policy Act process as impact topics. The impact topics are identified based on the potential environmental effects of the alternatives; federal laws, regulations, and Executive Orders; National Park Service *Management Policies-2006*. A list of impact topics and a summary of relevant regulations or policies related to each impact topic are provided in Table 1. Some impact topics were eliminated if they were anticipated to have no effect or a negligible effect on the environment. The rationale for the elimination of selected impact topics is summarized in the section that follows.

**TABLE 1. DERIVATION OF IMPACT TOPICS**

<b>Impact Topic</b>	<b>Relevant Regulations or Policies</b>
<b>Retained</b>	
<b>Air Quality</b>	Federal Clean Air Act; Clean Air Act Amendments of 1990; National Park Service Management Policy, 4.7.1, 2006
<b>Soils</b>	National Park Service Management Policy 4.8.2.4, 2006
<b>Wetlands</b>	Executive Order 11990; Clean Water Act Section 404; National Park Service Director's Order #77-1; Executive Order 11988; National Park Service Management Policy 4.6.5, 2006
<b>Aquatic Resources</b>	National Park Service Management Policy 4.6, 2006; Federal Water Pollution Control Act [The Clean Water Act of 1972 (as amended in 1977)]; Magnuson-Stevens Fishery Conservation and Management Act
<b>Water Quality</b>	Executive Order 12088; Executive Order 11990; National Park Service Management Policy 4.6.3, 2006; Federal Water Pollution Control Act [The Clean Water Act of 1972 (as amended in 1977)]; Section 404 of Clean Water Act. Florida Surface Water Quality 62-302 of the Florida Administrative Code.
<b>Special Status Species</b>	Endangered Species Act of 1973; National Park Service Management Policy 4.4.2.3, 2006; 40 Code of Federal Regulations 1500 (regulations for implementing the National Environmental Policy Act); Florida Endangered Species Act of 1976
<b>Visitor Use and Experience and Viewshed</b>	National Park Service Organic Act; National Park Service Management Policy 8.2, 2006
<b>Soundscape/Noise</b>	National Park Service Management Policy 4.9, 2006

**TABLE 1. DERIVATION OF IMPACT TOPICS**

<b>Impact Topic</b>	<b>Relevant Regulations or Policies</b>
<b>Historic and cultural resources, and design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures</b>	40 Code of Federal Regulations 1500 (regulations for implementing the National Environmental Policy Act); Section 106 of the National Historic Preservation Act; National Environmental Policy Act (NEPA) of 1969; Council on Environmental Quality regulations for implementing the National Environmental Policy Act (40 CFR Parts 1500-1508); National Park Service's Director's Order (DO) #12 and Handbook: Conservation Planning, Environmental Impact Analysis, and Decision Making (National Park Service 2001a); National Park Service's Directors Order #28A; Archeology; National Historic Preservation Act of 1966 and its implementing regulations at 36 CFR 800; Director's Order 28, Cultural Resource Management (National Park Service 1998a); National Park Service-28, Cultural Resource Management Guideline (National Park Service 1998b); National Park Service Management Policies 2006, especially Chapter 5; The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (1983, 48 FR 44716).

**TABLE 1. DERIVATION OF IMPACT TOPICS**

<b>Impact Topic</b>	<b>Relevant Regulations or Policies</b>
<b>Dismissed</b>	
<b>Geologic Resources</b>	National Park Service Management Policy 4.8, 2006
<b>Wildlife</b>	Management Policies 4.4.2, 2006, Migratory Bird Treaty Act
<b>Ecologically Critical Areas, Wilderness, Wild and Scenic Rivers, or Other Unique Natural Resources</b>	36 Code of Federal Regulations 62 (criteria for national natural landmarks); National Park Service Management Policies 4.3, 2006; Wilderness Act of 1964, National Park Service Management Policy 6.3, 2006
<b>Vegetation – Native Plant Communities</b>	National Park Service Management Policy 4.4.2, 2006
<b>Floodplains</b>	Executive Order 11988 (Floodplain Management); National Park Service Management Policy 4.6.4, 2006
<b>Prime and Unique Farmlands</b>	Council on Environmental Quality 1980 memorandum on prime and unique farmlands; 40 Code of Federal Regulations 1500 (regulations for implementing National Environmental Policy Act, section 1508.27
<b>Indian Trust / Sacred Sites</b>	Directors Order 72, Executive Order 13007; National Park Service Management Policy 5.3.5.3.2, 2006

**TABLE 1. DERIVATION OF IMPACT TOPICS**

<b>Impact Topic</b>	<b>Relevant Regulations or Policies</b>
<b>Ethnographic Resources</b>	National Park Service Management Policy 5.3.5.3, 2006
<b>Museum Collections</b>	National Park Service Management Policy 5.3.5.5, 2006
<b>Socioeconomics</b>	40 Code of Federal Regulations 1500 (regulations for implementing National Environmental Policy Act)
<b>Environmental Justice</b>	Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations)
<b>Transportation</b>	National Park Service Management Policy 9.2, 2006
<b>Land Use</b>	National Park Service Management Policy 3.4, 2006
<b>Coastal Zone Management</b>	Coastal Zone Management Act of 1972, National Park Service Management Policy 4.8.1.1, 2006
<b>Public Health and Safety</b>	National Park Service Management Policy 8.2.5, 2006
<b>Park Operations</b>	National Park Service Management Policy 9.1, 2006
<b>Concession Operations and Commercial Services</b>	National Park Service Management Policy 10.2, 2006
<b>Natural Lightscape (Night Sky)</b>	National Park Service Management Policy 4.10, 2006

### **Impact Topics Included in the Environmental Assessment**

The following impact topics represent resource areas that have the potential to be affected by the proposed action or the alternative to at least a minor extent. The existing conditions for these resource areas will be investigated in chapter 3 (Affected Environment) and the anticipated effects of the alternatives will be documented in chapter 4 (Environmental Consequences).

**Air Quality:** The 1963 Clean Air Act, as amended (42 United States Code 7401 et seq.), requires federal land managers to protect air quality, while the National Park Service *Management Policies – 2006* address the need to analyze air quality during park planning. The proposed seawall stabilization project is located in St. Johns County, Florida, which is currently a designated attainment area. This means that concentrations of criteria pollutants are within standards. Should an action alternative be selected, local air quality could be temporarily affected by emissions from internal combustion engines. If the proposed action is selected, hauling riprap material and placement of the material could result in increased emissions due to construction workers accessing the site, the operation of the marine engines for moving the barge, the industrial engines that operate the excavation equipment, and the diesel powered dump trucks that will transport the riprap material from the supplier to the barge. There could also be limited concrete dust that would become airborne during placement of the riprap. This would last only as long as construction activities occurred and would have a negligible effect on regional pollutant levels. However, depending on the wind direction, there could be minor adverse effects on air quality at the park during construction. These emissions would be

temporary and highly localized. For these reasons, air quality is an impact topic that was retained in this document.

**Soils:** Soil erosion is one of the primary reasons for implementing the proposed action. The historic seawall is damaged, which allows both seawater and rainwater to penetrate the seawall and erode the soil on the active side of the seawall. The proposed action is intended to reduce this soil erosion. Therefore, soils is an impact topic that was retained in this document.

**Aquatic Resources:** Construction of the proposed action will occur in the Matanzas River, a tidal body of water located west of the Atlantic Ocean, via the St. Augustine Inlet. Introduction of the riprap, as well as associated construction activities, could affect aquatic resources both during the construction phase and after construction is completed. For this reason, aquatic resources is an impact topic that was retained in this document.

**Wetlands:** The US Army Corps of Engineers defines wetlands as those areas “that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.” The majority of the area that will be filled by the riprap does not support vegetation, likely due to characteristics of the substrate, water depth, or other factors. The area devoid of vegetation is not considered wetlands. However, at the northern tip of the seawall, there is a small area that does support emergent aquatic vegetation in a shallow area subject to shoaling activity. This area would be considered a wetland and subject to the wetland regulations of the US Army Corps of Engineers. Therefore, wetlands is an impact topic that was retained in this document.

**Water Quality:** Construction of the proposed action could increase water turbidity due to marine propellers operating in the shallow waters near the fort, the driving of spuds to anchor the barge, and the placement of riprap on the soft bottom of the Matanzas River. After construction, the riprap could reduce the water turbidity by reducing the amount of soil that is transferred from the active (landward) side of the seawall to the passive (seaward) side of the seawall. For this reason, water quality was retained as an impact topic.

**Special Status Species:** There is the potential for the West Indian Manatee to populate the waters of the Matanzas River during certain times of the year. In addition to the manatee, there are five listed sea turtles that are potentially present in the vicinity during certain periods of the year. The construction phase could potentially affect these special status species. Therefore, special status species is an impact topic that was retained in this document.

### **Cultural Resources**

- **Historic Structures:** The proposed action involves the installation of riprap to support the seawall, a property that is a documented historic feature of the park. The seawall is on the park’s List of Classified Structures and has been determined eligible for the National Register of Historic Places. While the proposed action is intended to help preserve the seawall, it also could affect the historic materials

and appearance of this resource. For these reasons, historic structures is an impact topic that was retained in this document.

- **Cultural Landscapes:** Although it seems apparent that a historic cultural landscape exists at Castillo de San Marcos National Monument, the area (including structures such as the buildings and seawall, along with the surrounding landforms, vegetation, water, access corridors, and viewsheds) has not been fully documented by completion of a Cultural Landscape Report (National Park Service, 2006). As this project would affect the visual qualities of this historic scene, cultural landscapes is an impact topic that was retained in this document.

**Visitor Use and Experience / Viewshed:** Visitors to the park often walk along the seawall and gaze out to the east toward the Matanzas River and the St. Augustine Inlet. The addition of riprap along the seawall could affect the view from the seawall. Also, fishermen often fish along the Matanzas River grass flats to the east of the park. The addition of riprap could provide additional fish habitat that could affect the visitor experience for fishermen in waters near the park. For these reasons, the visitor use and experience / viewshed impact topic was retained as an impact topic in this document.

**Soundscape / Noise:** The park is located in an urban area. An arterial highway borders the west side of the park only 400 feet from the entrance to the fort. The soundscape in the area is that of an urban community. The proposed action would not change the noise conditions or soundscape of the park after construction is completed. However, during construction, the engines that operate the excavator on the barge would be running almost continuously. This would occur for a period of 60 to 90 days during construction activities for the seawall stabilization. These effects were estimated to be negligible to minor, local and short-term. For these reasons, noise is an impact topic that was retained in this document.

### **Impact Topics Dismissed From Further Analysis**

Certain potential impact topics were dismissed because these resources would not be affected by the alternatives or the potential for impacts under all alternatives would be negligible. These topics are listed below with the reasons they were not further addressed in this document.

**Geological Resources:** There are no unique geologic features located at the park or near the project site. There would be no affect to the geologic integrity of the site and there would be no geologic hazards created by the project. Soils are assessed as a separate impact topic. For this reason, geological resources is an impact topic that was dismissed in this document.

**Wildlife:** Wildlife includes terrestrial and aquatic species. The wildlife in the vicinity of the project site includes aquatic species such as fish and invertebrates that are able to relocate during the construction activity and return when construction is complete. No terrestrial wildlife habitat exists on the site. Aquatic species are addressed in the Aquatic Resources impact topic section of this environmental assessment. Therefore, wildlife was dismissed as an impact topic.

**Ecologically Critical Areas:** No congressionally designated natural resources, such as ecologically critical areas, Wilderness, Wild and Scenic Rivers, or other unique natural

resources are located at the park or within the project site. Therefore, ecologically critical areas is an impact topic that was dismissed in this document.

**Floodplains:** The park is located within a 100 year floodplain. The installation of riprap will provide support for the historic seawall, but would have no effect on flooding in the park or in the community, as the seawall is linear on a north-south axis and floodwaters can go around the ends of the seawall. For this reason, floodplains is an impact topic that was dismissed in this document.

**Vegetation – Native Plant Communities:** The vegetation landward of the seawall is turf grass which is routinely maintained by the staff at the park. The park service staff replaces the damaged turf periodically when it is impacted by the seawater seeping in through the seawall, or by high water events that overtop the seawall. The grass reduces surface water runoff and is important for the aesthetics of the park, but is not considered native vegetation. Seagrasses will be discussed in the environmental assessment under the topic of aquatic resources. For this reason, vegetation – native plant communities is an impact topic that was dismissed in this document.

**Prime or Unique Farmlands:** The Farmland Protection Policy Act and the U.S. Department of the Interior require an evaluation of impacts on prime and unique agricultural lands. The park is located in an urban area and is composed of the fort and surrounding turfgrasses. As prime and unique farmlands do not exist in the vicinity of the project, this topic was dismissed as an impact topic.

## Cultural Resources

**Archeological Resources:** None of the proposed work would involve ground disturbing activities that could disturb archeological resources. The riprap would be added on the seaward side of the wall; any features or artifacts that might be present in this area are not likely to have retained their original location due to the actions of tides and ocean currents, and these would simply be buried in place. Wall repairs would occur on the exposed portions of the seawall, and would not involve excavation behind the wall. For these reasons, archeological resources is an impact topic that was dismissed in this document.

**Collections:** Guidance provided by the National Park Service *Management Policies* (National Park Service, 2006a), National Park Service -28, *Cultural Resource Management Guidelines* (National Park Service, 1997), and Director's Order 77-2, *Floodplain Management* (National Park Service, 2003) mandates that a park's irreplaceable museum items, archival materials, photographs, natural and cultural specimens, artifacts, and other collections be protected from a variety of threats, including natural physical processes such as flooding, fire, theft, and vandalism. Only 97 of the more than 40,000 of the park's archeological and historic items are on exhibit throughout the park (most are housed elsewhere, including the Southeast Archeological Center and the Timucuan Ecological and Historical Preserve museum management facility). The park would continue to ensure continued protection of the museum collections in an environment that protects them from degradation, maintains their regional context and research value, and provides access for scholars. Thus, because actions from the alternatives would result in negligible effects to collections, collections is an impact topic that was dismissed in this document.

**Ethnographic Resources - Sacred Sites:** There are no sacred sites, as defined by Executive Order 13007, in or near the park. For this reason, sacred sites is an impact topic that was dismissed in this document.

**Indian Trusts:** There are no Indian trust resources, as defined by Directors Order #72, in or near the park. For this reason, Indian trusts is an impact topic that was dismissed in this document.

**Socioeconomics:** The riprap material is expected to be purchased locally and installed by a local contractor. The proposed action is anticipated to have a negligible short term effect on the regional economy. There would be no annual maintenance contracted for the riprap. There would be no additional government or private sector jobs created as a result of the proposed action. There would be no effects to community services or utilities as a result of the proposed action. For these reasons, socioeconomics is an impact topic that was dismissed in this document.

- **Environmental Justice:** Presidential Executive Order 12898, *General 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 the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. According to the Environmental Protection Agency, environmental justice is the:

...fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

The goal of 'fair treatment' is not to shift risks among populations, but to identify potentially disproportionately high and adverse effects and identify alternatives that may mitigate these impacts.

There are both minority and low-income populations in the general vicinity of the Castillo de San Marcos National Monument; however, environmental justice is dismissed as an impact topic because:

- The park staff and planning team actively solicited public participation as part of the planning process and gave equal consideration to all input from persons regardless of age, race, income status, or other socioeconomic or demographic factors.
- Implementation of the Preferred Alternative would not result in any identifiable adverse human health effects.

- The impacts associated with implementation of the Preferred Alternative would not disproportionately affect any minority or low-income population or community.
- Implementation of the Preferred Alternative would not result in any identified effects that would be specific to any minority or low-income community.
- The park staff and planning team do not anticipate the impacts on the socioeconomic environment to appreciably alter the physical and social structure of the nearby communities.

Therefore, environmental justice was dismissed as an impact topic.

**Transportation:** The riprap is anticipated to be transported from the supplier to a barge by dump truck, loaded onto a barge, and then transported to the park via waterborne barge. It is estimated that approximately 39 total dump truck loads will be transported to the barge over the 60 to 90 day construction schedule. It is anticipated that the barge will be loaded at the Vilano Beach Boat Basin, located to the north of the St. Augustine Inlet, so the dump trucks would probably use the Vilano Beach Bridge, a multilane highway, for access. It is estimated that approximately 13 barge loads of riprap would be transported from Vilano Beach to the park over the 60 to 90 day construction period. A few workers may arrive at the park via automobile or light truck during the construction phase. The proposed action is anticipated to have a negligible effect on transportation conditions in the St. Augustine area. Boaters are familiar with the existing historic seawall and the shallow waters adjacent to the seawall. Although the riprap extends into the Matanzas River from the seawall, the water is very shallow and there should be negligible effects on water transportation after construction is completed. For these reasons, transportation was dismissed from further analysis.

**Land Use:** The proposed action or alternatives would not affect any existing or proposed land uses either at the park or near the park. None of the alternatives would affect land use outside the park boundary, nor would they affect adjacent landowners. There are no inholdings, or nonfederal property owners affected by any of the alternatives. The alternatives would not affect land use plans, policies or controls in the surrounding area. Management and operation activities associated with the alternatives proposed would not conflict with other local, state or other plans. Therefore, there is no need to analyze in detail the conformity of the alternatives with local land use plans. For this reason, land use was dismissed as an impact topic.

**Coastal Zone Management:** In an effort to resolve conflicts between competing uses in the nation's coastal zone, Congress passed the Coastal Zone Management Act in 1972. This act sought to preserve, protect, develop, and where possible, restore and enhance the resources of the nation's coastal zone. The Florida Coastal Management Act of 1978 (Chapter 380, Part II, F.S.) was created as a result of the Federal legislation and authorized the former Department of Environmental Regulation to develop the Florida Coastal Management Program. This program ensures the wise use of the state's water, cultural, historic, and biological resources and helps to minimize the states vulnerability to coastal hazards; ensures compliance with the state's growth management laws; protects the state transportation system; and protects the state's proprietary interests and the owner of sovereign and submerged lands. The Florida Department of Environmental Protection serves as the clearinghouse for coastal zone consistency and



reviews Federal activities for consistency with the Coastal Zone Management Act. The clearinghouse has been contacted to determine this project's consistency with the Coastal Zone Management Act and coordination is ongoing.

**Public Health and Safety:** The proposed action would reduce the amount of soil erosion on the active side of the seawall, which led to the sinking of the sidewalk in recent years. The riprap would be composed of jagged rock which may be a difficult surface to walk on. As fishermen may walk on the riprap to access the saltwater flats and children may play on the riprap, it may be appropriate to post signs recommending caution. Public health and safety risks would be under control by the National Park Service and would be managed in compliance with applicable state and federal regulations. Appropriate health and safety precautions would be in place during construction activities. It is anticipated that the proposed action would have a negligible adverse effect on public health and safety. However, the soil on the landward side of the seawall would become more stabilized due to reduced erosion which could also lead to a negligible beneficial effect on public health and safety. For these reasons, public health and safety was dismissed as an impact topic.

**Park Operations:** There would be no additional staff required as a result of the proposed action. There would be no changes to park facilities or to the infrastructure at the park or the surrounding community as a result of the proposed action. There would be no annual maintenance associated with the proposed action. There may be the need for additional patching of the seawall in the future, but the riprap should not require maintenance. The installation of the riprap could reduce deterioration of the historic seawall, which could reduce maintenance in the future for park employees. For these reasons, park operations is an impact topic that was dismissed in this document.

**Concessions and Commercial Services:** The riprap would be installed by a commercial business, but the business is not anticipated to have a long term contractual relationship with the park. There would be no changes to the concessions or commercial services at the park as a result of the proposed action or the alternatives. Therefore, concessions and commercial services is an impact topic that was dismissed in this document.

**Lightscape:** The park is located in the downtown area near St. Augustine, where the night sky is well-lit and affected by artificial light. There would be no change to existing lighting at the park as a result of any of the alternatives. For these reasons, lightscape was dismissed as an impact topic.

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## CHAPTER 2 ALTERNATIVES

### INTRODUCTION

This chapter provides a description of the No Action Alternative, the Preferred Alternative, and the alternatives considered but dismissed from further study.

### THE NO ACTION ALTERNATIVE (ALTERNATIVE A)

The No Action Alternative is addressed in accordance within the National Environmental Policy Act. Under the No Action Alternative, the seawall at Castillo de San Marcos would remain in its current condition and would not be stabilized. Alternative A, the No Action Alternative, would consist of continuing the present management operations and conditions with regard to the seawall. Alternative A provides a basis for comparing the environmental consequences of Alternative B (Preferred Alternative). Should the No Action Alternative be selected, the National Park Service would respond to future needs and conditions associated with the park's objectives without major actions or changes from the present course. Figure 2 shows a photograph of the southern section of park seawall under the No Action Alternative.



### THE PREFERRED ALTERNATIVE (ALTERNATIVE B)

Alternative B was developed as a result of an engineering analysis conducted by the park in 2004. This alternative includes placing riprap along the seaward side of two sections of seawall to be stabilized (the southern segment and the northern segment). Riprap is a term for large rocks or boulders that are placed on the passive (seaward) side of the seawall to provide support for the wall and to reduce the erosive effects of wave action.

The southern segment (Section A) of the seawall is approximately 243 feet in length and is located at the southernmost area of the park (see Figure 3).





The northern segment (Section B) of the seawall is approximately 70 feet in length and is located near the northeast corner of the fort. The riprap would be installed from the base of the seawall to a height of 1.5 feet above sea level, or approximately 2.5 to 3.5 feet above the existing elevation at the base of the seawall. The riprap would extend seaward for 10 feet at a level elevation, and then the riprap would slope down at a 6:1 slope to grade. The riprap would extend seaward a minimum of 32 feet and a maximum of 39 feet from the seawall, depending on the structure of the river bottom. It is estimated that approximately 961 cubic yards of riprap material would be needed for this alternative. Details of the design are provided in Appendix B (Engineering Report). Figure 4 shows a photograph of the southern seawall section with the riprap in place.



Approximately 961 cubic yards of riprap would be purchased locally and transported by dump truck to a port (possibly Vilano Beach Boat Basin, located on the Matanzas River approximately 2 miles northeast of the park where the riprap would be transferred to a barge. It is estimated that approximately 39 dump truck loads would be required to transfer the riprap to the barge over a period of 60 to 90 days. The barge would be loaded with approximately 74 cubic yards of riprap and a diesel powered tugboat would transport the barge from the boat basin to the park. This would require approximately 13 round trip barge trips over the 60 to 90 day construction period. The barge would be held in place using spuds (sharp pointed vertical posts used to anchor the barge in place), so no engines would be running to keep the barge stationary while unloading riprap during the excavation process. An excavator would move the rock from the barge to the seawall. The excavator is powered by a diesel engine with several hundred horsepower. The excavator would run throughout each workday during the excavation at the job site, for a total of 60 to 90 days. There could also be some rock dust that would become airborne during placement of the riprap. The exhaust emissions and rock dust would last only as long as construction activities occurred, which is estimated to be a 60 to 90 day construction timeframe.

As mentioned, the construction area for the riprap would be from the edge of the seawall to 32 feet to 39 feet east of the seawall, depending on the river bottom structure. Depending on the size of barge that is used to transport the riprap, the overall construction impact area could extend out to 150 feet east of the seawall. Figure 5 and Figure 6 show the anticipated construction area for Alternative B.

### **OTHER ALTERNATIVES CONSIDERED BUT DISMISSED**

The city of St. Augustine is considering reconstruction of approximately 1,200 feet of the city seawall to the south of the Bridge of Lions from the Santa Maria Restaurant to the National Guard site (see Figure 7). The height of the new seawall would be 7.7 feet above mean sea level and would also extend into the ground approximately 26.8 feet below mean sea level. There would be a concrete cap on top of the sheet pile. This new seawall would be placed approximately 11 feet seaward of the historic city seawall. A promenade would be created by placing fill in the void with soil and surfacing with coquina pavers. Only the top of the historic seawall would be above ground, and this would serve as seating. The Florida State Historic Preservation Officer indicated that this alternative would result in significant adverse visual impacts to the historic scene. Therefore, this alternative was considered but dismissed.

A potential solution to help preserve the historic seawall at the park would be to install a drainage system between the active side of the seawall and the passive side of the seawall to relieve the hydraulic stresses created from water building up on the active side of the wall (J2 Engineering, Inc., 2004). This alternative was considered but dismissed due to significant adverse construction related impacts resulting from the extensive excavation on the landward side of the seawall.

Another potential solution to help preserve the historic seawall at the park was considered involving installation of a bulkhead to the west of the historic seawall and construction of a sidewalk between the seawall and bulkhead. This alternative would also help to relieve the hydraulic stresses created from water building up on the active side of the wall. This alternative was considered but dismissed due to the potential for significant adverse impacts to undiscovered archaeological and historic resources resulting from the extensive excavation on the landward side of the seawall.

### **OTHER ACTIONS**

A hydraulic lime mortar would be used to fill the cracks in the historic seawall to prevent water passage and further reduce the soil erosion on the active (landward) side of the seawall. The park will repair these cracks as an on-going maintenance task. The cost to repair the cracks is estimated at \$50,000 and the repair is anticipated to last 50 years (National Park Service, 2007a).

The project has been reviewed by the Florida Department of Environmental Protection with regard to consistency with the Florida Coastal Management Program. The Department found the project to be consistent with the Florida Coastal Management Program, but indicated that the final concurrence with consistency would occur during the environmental permitting stage of the project.

If Alternative B is selected for implementation, environmental permits would be required. Environmental permitting is discussed in Chapter 5.



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## **ALTERNATIVES COMPARISON**

### **Operational Cost**

Because the maintenance requirements and interpretive programs remain the same in each of the alternatives, the ongoing operational cost for the park will not vary. Based on discussions with park management, staffing is estimated to remain consistent to existing conditions for each of the alternatives. Annual operation cost for the park was \$1,463,000 in 2006 (National Park Service, 2007). Approximately \$460,000 of this cost was for maintenance.

### **Project Objectives**

The goal for the seawall stabilization project was identified in the “Purpose and Need” section. Implementation of the Preferred Alternative would effectively satisfy the project goal of stabilizing the seawall to ensure that it continues to protect the Castillo de San Marcos National Monument and surrounding property. Implementing the No Action Alternative would not satisfy the project goal.

Table 2 provides a brief summary of the effects of alternatives A and B on the impact topics that were retained for analysis. More detailed information on the effects of the alternatives is provided in Chapter 3, the “Affected Environment” section.

### **Impact Topic Threshold Definitions**

The terms used to define the magnitude or intensity of the effects for the impact topics that are retained for analysis in the environmental assessment are described in Table 2.

**TABLE 2. IMPACT TOPIC THRESHOLD DEFINITIONS**

<b>IMPACT TOPIC</b>	<b>NEGLIGIBLE</b>	<b>MINOR</b>	<b>MODERATE</b>	<b>MAJOR</b>	<b>DURATION</b>
Air Quality	No changes in air quality would occur or changes would be below or at the level of detection, and if detected, would have effects that would be considered slight and short-term.	Changes in air quality would be measurable, although the changes would be small, and the effects would be localized. No air quality mitigation measures would be necessary.	Changes in air quality would be measurable, would have consequences, although the effect would be relatively local. Air quality mitigation measures would be necessary and the measures would likely be successful.	Changes in air quality would be measurable, would have substantial consequences, and be noticed regionally. Air quality mitigation measures would be necessary and the success of the measures could not be guaranteed.	Short-term – Occurs only during the duration of the project. Long-term – Persists beyond the duration of the project.
Soils	Soils would not be affected or the effects on soils would be below or at the level of detection. Any effects on soil productivity or fertility would be slight and would return to normal shortly after completion of project activities.	The effects on soils would be detectable, but effects on soil productivity or fertility would be small. If mitigation was needed to offset adverse effects, it would be relatively simple to implement and would likely be successful.	The effect on soil productivity or fertility would be readily apparent and would result in a change to the soil character over a relatively wide area.	The effect on soil productivity or fertility would be readily apparent and would substantially change the character of the soils over a large area in and out of the park. Mitigation measures to offset adverse effects would be needed, and their success would not be assured.	Short-term - Following completion of the project, recovery would take less than a year. Long-term - Following completion of the project, recovery would take more than a year.
Aquatic Resources	No changes in aquatic resources would occur or changes would be below or at the level of detection, and if detected, would have effects that would be considered slight and short-term.	Changes in aquatic resources would be measurable, although the changes would be small, and the effects would be localized. No mitigation measures would be necessary.	Changes in aquatic resources would be measurable, would have consequences, although the effect would be relatively local. Aquatic resources mitigation measures would be necessary and the measures would likely be successful.	Changes in aquatic resources would be measurable, would have substantial consequences, and be noticed regionally. Mitigation measures would be necessary and the success of the measures could not be guaranteed.	Short-term – Occurs only during the duration of the project. Long-term – Persists beyond the duration of the project.
Wetlands	No changes to wetlands would occur or changes would be below or at the level of detection, and if detected, would have effects that would be considered slight and short-term.	The changes in wetland area or function would be measurable and permanent, although the effects would be small and localized. No mitigation measures would be required.	Changes in wetlands would be measurable, permanent and local. Wetland mitigation measures would be necessary and the measures would likely be successful.	Changes in wetlands would be measurable, permanent and regionally substantial. Wetland mitigation measures would likely be successful.	Short-term –construction specific impacts. Long-term – Permanent loss of wetland function.

**TABLE 2. IMPACT TOPIC THRESHOLD DEFINITIONS**

<b>IMPACT TOPIC</b>	<b>NEGLIGIBLE</b>	<b>MINOR</b>	<b>MODERATE</b>	<b>MAJOR</b>	<b>DURATION</b>
Water Quality	Impacts would not be detectable. Water quality parameters would be well below all water quality standards for the designated use of the water. No vegetation or wildlife effects associated with altered water quality would be evident.	Impacts would be measurable, but water quality parameters would be well within all water quality standards for the designated use. State water quality and anti-degradation policy would not be violated. Changes in vegetation or wildlife use and health associated with water quality would be slight but measurable.	Changes in water quality would be measurable and readily apparent, but water quality parameters would be within all water quality standards for the designated use. State water quality and anti-degradation policy would not be violated. Changes in vegetation and/or wildlife use and health associated with water quality would be measurable and readily apparent. Mitigation would be necessary to offset adverse effects, and would likely be successful.	Changes in water quality would be readily measurable, and some parameters would periodically be approached, equaled, or exceeded. State water quality regulations and anti-degradation policy may be violated. Changes in vegetation and/or wildlife use and health associated with water quality would be measurable and readily apparent, even to a casual observer. Extensive mitigation measures would be necessary and their success would not be assured.	Short-term - Following implementation activities, recovery would take less than one year  Long-term - Following implementation activities, recovery would take longer than one year.

**TABLE 2. IMPACT TOPIC THRESHOLD DEFINITIONS**

<b>IMPACT TOPIC</b>	<b>NEGLIGIBLE</b>	<b>MINOR</b>	<b>MODERATE</b>	<b>MAJOR</b>	<b>DURATION</b>
Special Status Species	No federally- or territorial-listed species would be affected, or the action would affect an individual of a listed species or its critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence to the protected individual or its population. Negligible effect would equate with a “no effect” USFWS determination.	The action would result in detectable impacts to an individual (or individuals) of a federally or territorially listed species or its critical habitat, but they would not be expected to result in substantial population fluctuations and would not be expected to have any measurable long-term effects on species, habitats, or natural processes sustaining them. Minor effects would equate with a “may affect/not likely to adversely affect” USFWS determination.	An action would result in detectable impacts on individuals or population of a federally or territorially listed species, critical habitat, or the natural processes sustaining them. Key ecosystem processes may experience disruptions that may result in population or habitat condition fluctuations that would be outside the range of natural variation (but would return to natural conditions). Moderate level adverse effects would equate with a “may affect/likely to adversely affect/adversely modify critical habitat” USFWS determination.	Individuals or population of a federally or territorial listed species, critical habitat, or the natural processes sustaining them would be measurably affected. Key ecosystem processes may be permanently altered resulting in long-term changes in population numbers and permanently modifying critical habitat. Major adverse effects would equate with a “may affect/likely to adversely affect/adversely modify critical habitat” USFWS determination.	Short-term - Recovers in less than a year after project construction. Long-term - Takes more than a year to recover after project is constructed.

**TABLE 2. IMPACT TOPIC THRESHOLD DEFINITIONS**

<b>IMPACT TOPIC</b>	<b>NEGLIGIBLE</b>	<b>MINOR</b>	<b>MODERATE</b>	<b>MAJOR</b>	<b>DURATION</b>
Historic Structures, Buildings, and Districts listed on or eligible for the National Register of Historic Places (All unevaluated historic resources would be considered eligible for the National Register of Historic Places until evaluation is completed).	The action would not have the potential to cause effects on historic structures, buildings, or districts that would alter any of the characteristics qualifying the resource for inclusion in or eligibility for the National Register. For purposes of §106, the determination would be no adverse effect.	Adverse effect - The action would affect one or more features of a structure, building, or district, but it would neither alter its character-defining features nor diminish the overall integrity of the property. For purposes of §106, the determination of effect would be no adverse effect.  Beneficial effect - The action would maintain and improve the character-defining features of the structure, building, or district in accordance with The Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995). For purposes of §106, the determination of effect would be no adverse effect.	Adverse effect - The action would alter one or more character-defining features of a structure, building, or district. While the overall integrity of the resource would be diminished, the property would retain its National Register eligibility. For purposes of §106, the determination of effect would be adverse effect.  Beneficial effect - Positive actions would be taken to preserve and noticeably enhance character-defining elements of a structure, building, or district in accordance with The Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1995c). For purposes of §106, the determination of effect would be no adverse effect.	Adverse effect -The action would alter character-defining features of the structure, building, or district, seriously diminishing the overall integrity of the resource to the point where its National Register eligibility may be in question. For purposes of §106, the determination of effect would be adverse effect.  Beneficial effect - The action would enhance the character-defining features of a structure, building, or district that represents important components of the nation's historic heritage and would foster conditions under which these cultural foundations of the nation and modern society could exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations. For purposes of §106, the determination of effect would be no adverse effect.	Historic structures, buildings and districts are non-renewable, so adverse effects would be long-term.

**TABLE 2. IMPACT TOPIC THRESHOLD DEFINITIONS**

<b>IMPACT TOPIC</b>	<b>NEGLIGIBLE</b>	<b>MINOR</b>	<b>MODERATE</b>	<b>MAJOR</b>	<b>DURATION</b>
Cultural Landscapes listed on or eligible for the National Register of Historic Places (All unevaluated historic resources would be considered eligible for the National Register of Historic Places until evaluation is completed)	Negligible effect - The action would not have the potential to cause effects to a pattern(s) or feature(s) of the landscape that would alter any of the characteristics qualifying the resource for inclusion in or eligibility for the National Register. For purposes of §106, the determination would be no adverse effect.	Adverse effect - The action would affect a pattern(s) or feature(s) of the landscape(s), but it would neither alter the character-defining features nor diminish the overall integrity of the property. For purposes of §106, the determination of effect would be no adverse effect.  Beneficial effect - The action would improve the character defining features of a cultural landscape in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. For purposes of §106, the determination of effect would be no adverse effect.	Adverse effect - The action would affect a character defining pattern(s) or feature(s) of the landscape. While the overall integrity of the resource would be diminished, the property would retain its National Register eligibility. For purposes of §106, the determination of effect would be adverse effect.  Beneficial effect -Positive actions would be taken to preserve and noticeably enhance character defining features of a cultural landscape in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. For purposes of §106, the determination of effect would be no adverse effect.	Adverse effect - The action would affect a character defining pattern(s) or feature(s) of the landscape, seriously diminishing the overall integrity of the resource to the point where its National Register eligibility may be in question. For purposes of §106, the determination of effect would be adverse effect.  Beneficial effect - The action would enhance the character defining features of a cultural landscape in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. For purposes of §106, the determination of effect would be no adverse effect.	Short-term –Patterns or features of a cultural landscape, such as vegetation, recover in less than one year  Long-term - Patterns or features of a cultural landscape, such as vegetation, recover in more than one year.  Permanent - Patterns or features of a cultural landscape are irrevocably affected.
Visitor use and experience / Viewshed	Visitors would not be affected, or changes in visitor experience and/or understanding would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the alternative.	Changes in visitor experience and/or understanding would be detectable, although the changes would be slight. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.	Changes in visitor experience and/or understanding would be readily apparent. The visitor would be aware of the effects associated with the alternative and would likely be able to express an opinion about the changes.	Changes in visitor experience and/or understanding would be readily apparent and have important consequences. The visitor would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes.	Short-term – Effects occur only during project implementation activities.  Long-term – Effects extend beyond project implementation activities.

**TABLE 2. IMPACT TOPIC THRESHOLD DEFINITIONS**

<b>IMPACT TOPIC</b>	<b>NEGLIGIBLE</b>	<b>MINOR</b>	<b>MODERATE</b>	<b>MAJOR</b>	<b>DURATION</b>
Soundscape / Noise	Human-caused or project sounds do not compete with ambient sounds. Where project related noise is audible, it is for short duration, with significantly lengthy periods of time that are noise free.	Human-caused or project sounds are detectable above ambient sounds; however, there are frequent periods of time that are noise free. Where project related noise is audible, impacts occur for short duration (less than an hour) during the day.	Human-caused or project sounds compete with ambient sounds. The noise generated by project activities is perceptible for extended periods throughout the day. There are however short periods of time that are noise free.	Human-caused sounds dominate the soundscape and replace natural sounds. Natural sounds in the project area are commonly impacted by noise from project related activities for most of the day without periods of time that are noise free.	Short-term – Occurs only during the duration of the project.  Long-term – Persists beyond the duration of the project.



## IMPACT SUMMARY

Table 3 presents a summary comparison of the effects of the alternatives based on the evaluation of the impact topics in chapter 4, Environmental Consequences.

**TABLE 3. SUMMARY OF IMPACTS FOR ALTERNATIVES CONSIDERED**

<b>Impact Topic</b>	<b>Alternative A No Action Alternative</b>	<b>Alternative B Preferred Alternative</b>
Air Quality	The implementation of Alternative A would result in no effects to air quality in or near the park. Overall, when effects of other plans, projects, and activities affecting air quality are combined with these effects of actions under Alternative A, cumulative, negligible, adverse, long-term and short term, local effects would occur.	Anticipated impacts during construction of Alternative B would be negligible, adverse, short term, indirect, and local if construction occurs during the winter months. Anticipated impacts during construction would be minor, adverse, short term, indirect, and local if construction occurs during the spring or summer months. The dump trucks that are used to transport the riprap to the barge would have a negligible, adverse, short term, indirect, regional effect on air quality. Once construction is completed, there would be no effects on air quality at the park due to Alternative B. Overall, when effects of other past, present, and future plans, projects, and activities affecting air quality are combined with the effects of actions under Alternative B, cumulative, negligible to minor, adverse, short term, indirect effects would occur.
Soils	The implementation of Alternative A would result in a moderate to major adverse, long term, indirect, local effect on soils at the park. Overall, when effects of other past, present, and future plans, projects, and activities affecting soils are combined with the effects of actions under Alternative A, the cumulative effects would be moderate to major, adverse, long term, indirect, and local.	Implementation of the Preferred Alternative would result in a moderate, beneficial, long-term, direct effect on local soils because it would prevent further erosion of the backfill soils. Overall, when effects of other past, present, and future plans, projects, and activities affecting soils are combined with the effects of actions under Alternative B, the cumulative effects would be moderate to major, adverse, long term, indirect, and local.
Wetlands	Alternative A would have no effect on wetlands. Overall, when effects of other plans, projects, and activities affecting wetlands are combined with these effects of actions under Alternative A, cumulative, moderate, adverse, long term, direct, and local effects would occur.	The construction of Alternative B would result in minor, adverse, short term and long term, direct, local effects on wetlands. Overall, when effects of other plans, projects, and activities affecting wetlands are combined with these effects of actions under Alternative B, cumulative, moderate, adverse, long-term, direct, local effects would occur.

**TABLE 3. SUMMARY OF IMPACTS FOR ALTERNATIVES CONSIDERED**

<b>Impact Topic</b>	<b>Alternative A No Action Alternative</b>	<b>Alternative B Preferred Alternative</b>
Aquatic Resources	Alternative A would have a negligible, adverse, long term, indirect, local impact on aquatic resources. Overall, when effects of other plans, projects, and activities affecting aquatic resources are combined with these effects of actions under Alternative A, cumulative, minor, adverse, long term, direct, and local effects would occur.	The construction activity associated with Alternative B would result in minor, adverse, short term, direct and indirect, local effects on aquatic resources. Once in place, Alternative B would result in a minor, beneficial, long term, indirect, local effect on aquatic resources. Overall, when effects of other plans, projects, and activities affecting aquatic resources are combined with these effects of actions under Alternative B, cumulative, minor, adverse, long-term and short term, local effects would occur.
Water Quality	Water quality impacts as a result of the No Action Alternative would be negligible to minor, adverse, long term, indirect, and local. Overall, when effects of other plans, projects, and activities affecting water quality are combined with these effects of actions under Alternative A, cumulative, long-term and short term, negligible, local adverse effects would occur.	The effects on water quality resulting from the construction of the Preferred Alternative would be minor, adverse, short term, indirect, and local. The effects on water quality resulting from the operation of the Preferred Alternative would be negligible, beneficial, long term, indirect, and local. Overall, when effects of other plans, projects, and activities affecting water quality are combined with these effects of actions under Alternative B, cumulative, negligible, adverse, long-term and short term, local effects would occur.
Special Status Species	This alternative would have no effect on the West Indian manatee or sea turtles and their habitat. Overall, when effects of other past, present, and future plans, projects, and activities affecting sea turtles, West Indian manatees, and their habitat are combined with the effects of actions under Alternative A, cumulative, negligible, adverse, short term, local effects would occur.	Construction of the Preferred Alternative would have negligible, adverse, short term, local, indirect effect on the sea turtle and the West Indian manatee. After construction is completed, the riprap would have no effect on the sea turtle or the West Indian manatee. Overall, when effects of other plans, projects, and activities affecting the sea turtle and the West Indian manatee and their habitat are combined with these effects of actions under Alternative B, cumulative, negligible, adverse, short term, local effects would occur.

**TABLE 3. SUMMARY OF IMPACTS FOR ALTERNATIVES CONSIDERED**

<b>Impact Topic</b>	<b>Alternative A No Action Alternative</b>	<b>Alternative B Preferred Alternative</b>
Cultural Resources	<p>Continuation of existing conditions as described for Alternative A would have a long-term, local, moderate, adverse effect, both direct and indirect, on the park's historic structures, and to historic features of St. Augustine. Cumulative effects would be moderate, adverse, long term, direct and indirect and local, resulting from past and future natural processes and from human activities such as demolition of the original seawall and construction and maintenance of the present wall, as well as proposed development of a new city seawall.</p> <p>Continuation of existing conditions as described for Alternative A would have a long-term moderate adverse effect, both direct and indirect, on the cultural landscape. Cumulative effects would be moderate, adverse, long-term, direct and indirect, and local, resulting from past and future natural processes and from human activities such as demolition of the original seawall and construction and maintenance of the present wall, as well as proposed development of a new city seawall.</p>	<p>Placement of the riprap and repairs to the wall would have a moderate, beneficial, long-term, direct and indirect, local effect on the integrity of the wall. Preservation of the wall would, in turn, contribute to preservation of the historic structures within the park. Overall, when effects of other past, present, and future plans, projects, and activities affecting cultural resources are combined with the beneficial effects of actions under Alternative B, cumulative, moderate, beneficial, long-term, direct and indirect, local effects would occur to historic structures at the park.</p> <p>Short-term visual effects of implementation of Alternative B would be adverse, minor, direct, and local. Long-term visual effects would be negligible, adverse, direct, and local. Long-term direct effects on other landscape elements – such as the wall itself, the walkways, structures, and grass vegetation behind the seawall—would be moderate, beneficial, indirect, and local. Overall, when past, present, and future effects of other plans, projects, and activities affecting cultural resources are combined with these effects of actions under Alternative B, there would be a cumulative, minor, adverse, long-term, indirect, local effect.</p>
Visitor Use and Experience - Viewshed	<p>There would be negligible beneficial or adverse, direct or indirect, local or regional effects on visitor use and experience in the short term. However, in the long term, Alternative A would result in moderate, adverse, direct, local effects on visitor use and experience and viewshed. Overall, when effects of other plans, projects, and activities affecting visitor use and experience and viewshed are combined with these effects of actions under Alternative A, cumulative effects on visitor use and experience and the viewshed would be moderate, adverse, direct, and local.</p>	<p>Alternative B would result in moderate, adverse, short term, direct, local effects on visitor use and experience and moderate, adverse, short term, direct, local effects to the viewshed during the construction period. Alternative B would result in minor, beneficial, long term, indirect, local effects on visitor use and experience and negligible to minor, adverse, long term, direct, local effects to viewshed after construction is completed. Overall, when effects of other past, present, and future plans, projects, and activities affecting visitor use and experience and viewshed are combined with the effects of actions under Alternative B, Alternative B would result in moderate, adverse, short term, direct, local effects on visitor use and experience and viewshed; minor, beneficial, long term, indirect, local effects on visitor use and experience; and negligible to minor, adverse, long term, direct, local effects to</p>

**TABLE 3. SUMMARY OF IMPACTS FOR ALTERNATIVES CONSIDERED**

<b>Impact Topic</b>	<b>Alternative A No Action Alternative</b>	<b>Alternative B Preferred Alternative</b>
		viewshed.
Soundscape / Noise	The No Action Alternative would result in no effects to the soundscape or noise near the park. Overall, when effects of other plans, projects, and activities affecting the soundscape are combined with these effects of actions under Alternative A, cumulative, negligible, adverse, long-term, local effects would occur.	Alternative B would result in minor, adverse, short term, indirect, and local effects during the spring and summer months and negligible to minor, adverse, short term, indirect, and local effects during the winter months. There would be no effects associated with operation of Alternative B after construction is completed. Overall, when effects of other past, present, and future plans, projects, and activities affecting soundscape are combined with the effects of actions under Alternative B, cumulative effects to the soundscape would be minor, adverse, short term, indirect, and local during the spring and summer months and negligible to minor, adverse, short term, indirect, and local during the winter months. The long term cumulative effects would be negligible, adverse, indirect, local effects.

### **THE ENVIRONMENTALLY PREFERRED ALTERNATIVE**

The environmentally Preferred Alternative is the alternative that will best promote the national environmental policy expressed in the National Environmental Policy Act. The environmentally Preferred Alternative would cause the least damage to the biological and physical environment, and would best protect, preserve, and enhance historical, cultural, and natural resources.

Section 101(b) of the National Environmental Policy Act identifies six criteria to help determine the environmentally Preferred Alternative. The act directs that federal plans should:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
2. Assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.
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. Preserve important historical, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment which supports diversity and variety of individual choice.
5. Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities.
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Alternative B, the Preferred Alternative, meets these goals more effectively than Alternative A, the No Action Alternative. The Preferred Alternative would effectively help to preserve the seawall as an historic resource. The six criteria are addressed below.

1. Alternative B would enable the National Park Service to better “Fulfill the responsibilities . . . as trustee of the environment...” by preserving the historic 19th century seawall for future generations to view and enjoy in its historic context.
2. “Safe, healthful, productive, and esthetically and culturally pleasing surroundings” would best be provided for under Alternative B. This alternative would help to preserve the historic seawall and would reduce the soil erosion on the landward side of the wall that resulted in the sinking of the park sidewalk in recent years. The stabilization efforts proposed would result in safer walking and viewing conditions.
3. Alternative B would have a small advantage with regard to “range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.” Although the placement of the riprap would alter the existing habitat, new habitat would be created for marine life which would attract fish and other sea life to the area. This could be a benefit to the visitor in terms of visual enjoyment, as well as recreation. The stabilization of the seawall would help to preserve the soil on the active side of the wall and reduce damage to the sidewalk located adjacent to the seawall.
4. Alternative B would better “preserve important historical, cultural, and natural aspects of our national heritage” by reducing the effects of wave and tidal action on the historic seawall. Alternative B would preserve the existing historic seawall, whereas Alternative A would not.
5. Neither Alternative A or B provide distinguishable advantages regarding criteria to achieve a balance between population and resource use which would permit high standards of living and a wide sharing of life’s amenities.
6. Neither alternative would propose a long term change regarding renewable resources; therefore, no discernable difference exists between the alternatives for this factor. However, Alternative B proposes to essentially “recycle” the existing historic seawall by adding riprap to stabilize the wall against further damage. Stabilizing the wall would also reduce erosion of the soil, a depletable resource, on the active side of the wall.

Alternative B, the Preferred Alternative, is the environmentally Preferred Alternative as it best satisfies 5 of the 6 criteria for defining the environmentally Preferred Alternative.

#### **MITIGATION MEASURES FOR THE ACTION ALTERNATIVES**

Mitigation involves measures taken to avoid, reduce, or minimize potentially adverse impacts. It is a key concept in resource management planning. Here, it provides a means for accommodating visitor interactions and park operations with natural and cultural resources and their tolerances for disturbances. Mitigation and best management practices are regularly used to ensure that the park’s natural and cultural resources are protected and preserved for future visitors without impairment. In the legislation creating the National Park Service, Congress charged it with managing lands under its

stewardship “in such manner and by such means as will leave them unimpaired for the enjoyment of future generations”(National Park Service Organic Act, 16 United States Code 1). As a result, the National Park Service routinely evaluates and implements mitigation whenever conditions occur that could adversely affect the sustainability of park resources.

Mitigation was included throughout the formulation of the alternatives included in this environmental assessment. Construction zones would be identified and fenced with temporary fencing or a similar material prior to any construction activity. The fencing would define the construction zone and confine activity to the minimum area required. All protection measures would be clearly stated in construction specifications, and workers would be instructed to avoid areas beyond the fencing.

For the action alternative, best management practices and other mitigation measures would be used to prevent or minimize potential adverse effects associated with stabilization of the historic seawall. These practices and measures would be incorporated into the project construction documents and plans to reduce the magnitude of impacts and ensure that major adverse impacts would not occur. Mitigation measures undertaken during project implementation would include, but would not be limited to those listed below. The impact analysis in Chapter 4, “Environmental Consequences” was performed assuming that these best management practices and mitigation measures would be implemented as part of the action alternative.

**Air Quality.** Reducing the effects of Alternative B on air quality would include best management practices, such as turning off the excavator and tugboat engines when not in use and ensuring that the engines are in proper working order to reduce emissions, as well as scheduling activities to minimize impacts. Measures to control dust and erosion during construction could include the following: wetting the riprap as needed to reduce dust when excavating riprap above the waterline and covering haul trucks.

**Soils.** In addition to the riprap installation, soil erosion could be reduced by the maintenance activity of patching the cracks in the seawall that allow water to migrate through the cracks and transport soil into the Matanzas River. This occurs during high tide events where saltwater migrates through the cracks and loosens and suspends the soil on the active side of the seawall. As the tide recedes, the saltwater transports the soil through the cracks into the river. This erosion also occurs during rainstorms when freshwater builds up on the active side of the seawall, suspends the soil, and transports it through the cracks in the seawall into the river.

**Water Quality.** The use of best management practices would reduce the adverse effects to the Matanzas River and restrict water quality disturbances to within the construction area until the suspended particles have an opportunity to settle into the substrate.

**Special Status Species.** As the water is very shallow near the seawall even during high tide, a manatee or sea turtle could be easily seen by the excavation operator and crew. If a special status species is observed, construction should cease until the species moves away to a safe location away from the construction area. For all action alternatives, mitigation actions would occur prior to construction to minimize immediate and long-term impacts to rare, threatened, and endangered species. Surveys would be conducted for such species as warranted. Facilities would be sited and designed so as to avoid adverse effects to such species whenever possible. If avoidance is infeasible, adverse

effects would be minimized and compensated for, as appropriate, and in consultation with appropriate resource agencies.

**Cultural Resources.** All rehabilitation of historic features in the seawall would be conducted in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties and in consultation with the Florida state historic preservation office. Work would be documented photographically and in written text and these records would be retained by the park as part of their archival collections. If prehistoric or historic archeological resources are discovered during any portion of the project, an archeologist meeting the Secretary of the Interior's Standards would help ensure that procedures outlined in 36 CFR 800 would be followed, potentially including relocation of the work to a non-sensitive area to avoid further disturbance to the site until the significance of the find can be evaluated. Discovered resources would be evaluated for their potential National Register of Historic Places significance, and, if needed, mitigation measures would be developed in consultation with the Florida State Historic Preservation Officer and appropriate representatives of affected tribes. Mitigation measures would be cognizant of resource significance and preservation needs, and could include such provisions as changes in project design and/or archeological monitoring of the project and data recovery conducted by an archeologist meeting the Secretary of the Interior's standards. Construction personnel would be educated about the need to protect any cultural resources encountered. Work crews would be instructed of the illegality of collecting artifacts on federal lands (Archeological Resources Protection Act).

**Soundscape/Noise.** Standard noise abatement measures would be implemented during park operations and construction activities. These measures could include: scheduling activities to minimize impacts, use of the best available noise control techniques, ensuring that the engines are properly muffled, and turning off excavator and tugboat engines when not in use.

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## CHAPTER 3 AFFECTED ENVIRONMENT

### INTRODUCTION

This section describes the existing conditions for each resource impact topic that could be affected by the Proposed Action Alternative and the No Action Alternative. As discussed in Chapter 1, Purpose and Need, the National Park Service identified the impact topics that may be affected by the Proposed Action or the No Action Alternative. This description presents a baseline for comparative analysis of predicted effects of each of the alternatives that will be described in Chapter 4, Environmental Consequences.

### AIR QUALITY

The Clean Air Act of 1970 established national policy for protection, preservation and enhancement of air quality. The 1977 Clean Air Act Amendments offered the highest level of air quality protection to National Parks with areas greater than 6,000 acres. These areas are designated Class I areas. The Castillo de San Marcos National Monument is designated as a Class II air quality area (National Park Service, 2007b). Class II areas are generally provided somewhat less stringent protection from air pollution damage than Class I areas. However, all National Park properties have a responsibility to protect air quality related values from adverse pollution impacts, including visibility, plants, soils, water quality, cultural resources, and visitor health. Individual parks are also provided opportunities to participate in the development of pollution control programs for their area. In addition, the National Park Service *Management Policies – 2006* address the need to analyze air quality during park planning.

The proposed Castillo de San Marcos National Monument seawall stabilization project is located in St. Johns County, Florida, which was designated as an attainment area in March 1995 (First Coast Metropolitan Planning Organization, 2005). This means that concentrations of criteria pollutants are within air quality standards set forth by the United States Environmental Protection Agency. The area of potential effect for air quality is the park and the surrounding area adjacent to the park.

Although some National Parks have air quality monitoring in the vicinity of the park, there are no monitoring stations near Castillo de San Marcos National Monument (National Park Service, 2007b). In fact, ozone monitoring in St. Johns County was suspended in 1998 due to consistent high air quality readings (Florida Department of Environmental Protection, 2007). There are several air quality monitoring sites in Duval County, which is located just to the north of St. Johns County and contains the city of Jacksonville. Data from these sites also show that the Jacksonville Urban Area, including St. Augustine, is in attainment of federal air quality standards. Air quality in the Jacksonville area is anticipated to remain within the federal standard in the future, as well (First Coast Metropolitan Planning Organization, 2005). Studies prepared by the Metropolitan Planning Organization have shown that locally generated emissions for 2005, 2015, and 2025 are predicted to be significantly below the levels needed to maintain current and future air quality standards.

### SOILS

The soils at the park were surveyed in 1983 by the United States Department of Agriculture Natural Resources Conservation Services. The area of potential effect for soils is the landward area immediately adjacent to the seawall. The soils were determined to be Made Land soils,

which are soils that have been moved, altered or otherwise disturbed by man. Made Land soils are often a homogeneous mixture of soils from a variety of locations. Historically, the seawalls at the park were constructed and then backfilled with material from the bay bottom, which was the most convenient source of soil in this area during the time of construction. In this case, the soils landward of the seawall would be predominantly sandy with a small amount of rock for stability.

Soil erosion is occurring as a result of the failing seawall. During high tide or storm events, saltwater penetrates the cracks in the seawall and suspends the sand particles. When the tide recedes, it carries the suspended particles with it into the Matanzas River. During heavy rain storms, freshwater builds up on the active side of the seawall and can also carry soil through the cracks in the seawall into the Matanzas River. This action exacerbates the problems with the failing seawall.

## WETLANDS

Wetlands are defined in 33 Code of Federal Regulations, Part 328 (b) as those areas “that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetlands generally include swamps, marshes, bogs, and similar areas.

The majority of the construction zone does not qualify as wetlands because of the absence of seagrasses and emergent aquatic vegetation. However, at the northern tip of the seawall, a sand bar has developed and approximately 200 square feet of this area is vegetated with smooth cord grass (*Spartina alterniflora*) just below mean high water. This area would be considered a jurisdictional wetland and is subject to regulation under Section 404 of the Clean Water Act. The landward jurisdictional limits of the wetlands would stop at the seawall, and the waterward limits would extend to the limits of the vegetation. A wetland delineation would be required for the permitting phase of the project to identify and formally quantify the extent of smooth cordgrass within the northern construction area.

Smooth cord grass is a prolific species in Matanzas River and Matanzas Bay. It is a shoreline or shallow water aquatic species that grows in the extensive salt marshes of Fort Matanzas National Monument, and it is the dominant marsh species within the Guana, Tolomato, Matanzas National Estuarine Research Reserve, the 59,000 acre research area within the Matanzas Bay estuarine system (National Estuarine Resource Reserve System, 2007). Smooth cord grass is not considered a seagrass. Smooth cord grass is an important resource in this estuary in that it pulls nutrients out of the water, it prevents erosion, and waterfowl and some mammals eat the roots and young shoots. Smooth cord grass also serves as a precursor species for mangrove development, and it provides a nursery for some fish and invertebrate species (Western Aquatic Plant Management Society, 2007). However, the smooth cord grass located near the seawall in the project area does not likely provide many of those functions, with the exception of erosion control, due to the location in the disturbed habitat and the lack of additional suitable habitat.

## AQUATIC RESOURCES

This section describes the aquatic resources that occur near the seawall at the park. Aquatic resources include all seagrasses and other aquatic vegetation, aquatic invertebrates, fish and essential fish habitat, and marine mammals, with the exception of special status species such as sea turtles and the West Indian manatee. The special status species are discussed in a separate subsection of this chapter.

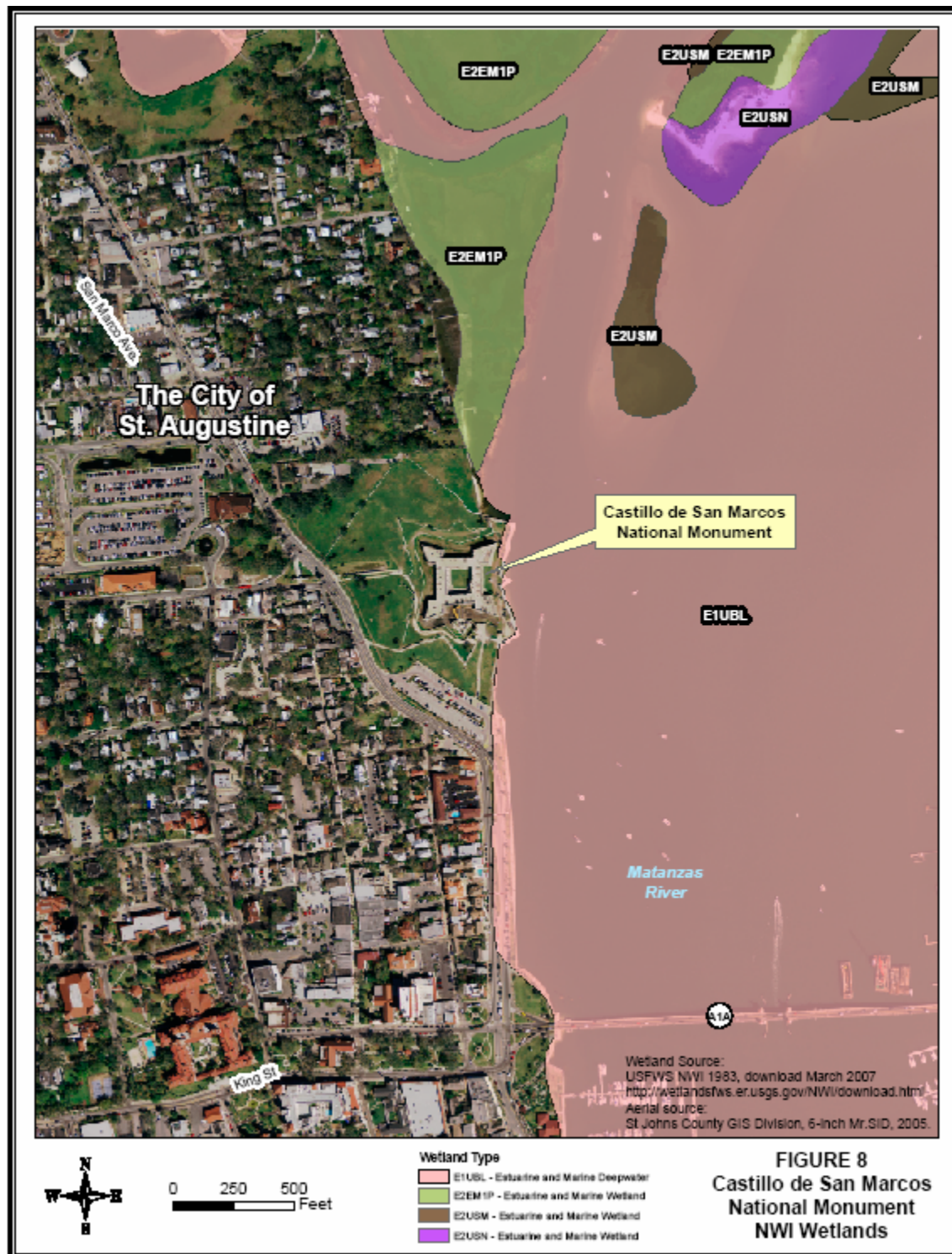
The construction zone would include the areas that would use barges and other vessels associated with the construction of the seawall, and the area in which riprap would be placed. The areas in which riprap would be placed would include two areas: (1) a 70 foot section along the seawall that would extend approximately 32 feet into the Matanzas River near the north end of the park; and (2) a 243 foot section along the seawall that would extend approximately 32 to 39 feet into the river near the south end of the park (see Figures 5 and 6). An additional 111 to 118 feet of river would be used at the north and south construction sites to anchor the barge during installation of the riprap, resulting in a total construction area of approximately 150 feet in width. The environmental assessment therefore focuses on all the resources and activities within the two 150 foot wide construction zones.

The park lies in the urbanized area of St. Augustine on the Matanzas River, approximately 1.5 miles southwest of the St. Augustine Inlet to the Atlantic Ocean (see Figure 1). The Matanzas River forms an estuary that is oriented in a north-south direction behind a system of barrier islands along this portion of the Florida coast. The St. Augustine Inlet and portions of the river in the vicinity of the park are part of the Intercoastal Waterway and are routinely dredged by the U.S. Army Corps of Engineers to improve navigation for commercial and recreational vessels (St. Augustine Port, Waterway, and Beach District, 2007). The main channel of the Intercoastal Waterway is located approximately 1000 feet to the east of the seawall (Figure 7).

The park is located between the Guana River Marsh Aquatic Preserve, approximately 3 miles to the north of the park, and the Pellicer Creek Aquatic Preserve, approximately 3 miles to the south of the park. These preserves are owned and operated by the state of Florida Department of Environmental Protection. The Matanzas River in the vicinity of the park, however, is not designated as an aquatic preserve.

The site conditions have been previously disturbed by the construction of the historic seawall and modern-day dredging operations in the vicinity that created silt that was deposited in the construction area. It can be assumed that the habitat in the area currently occupied by the seawall once resembled the undeveloped areas within the estuary, and that the area was highly productive with respect to aquatic resources. The seawall and the associated development displaced the historic aquatic resources by filling of the salt marsh or mangrove communities that were likely there before the seawall was built. The periodic dredging activity is necessary to maintain the Intercoastal Waterway and the St. Augustine Inlet and will continue in perpetuity. The inlet has been dredged since 1940, and the last dredging occurred in 2003 (Taylor Engineering, Inc., 2005). In addition, studies have shown that benthic populations in dredged areas typically re-colonize within a few months (Charvat, Nelson and Allenbaugh 1990).

The depth of the Matanzas River in the vicinity of the seawall in the construction zone is approximately three feet at normal high tide. At low tide, a horizontal band of approximately 10 to 15 feet of the inter-tidal flat is exposed along the full length of the seawall. According to park staff, the substrate in the area where the riprap would be placed is primarily sand with little organic matter present. No data are available for substrates within the remaining 100 feet of the construction zone, other than the National Wetland Inventory maps which indicate that the area would be classified as Estuarine (E), Sub-tidal (1), Unconsolidated Bottom (UB), and Sub-tidal (L) (see Figure 8). Unconsolidated Bottom includes all wetlands and deepwater habitats with at least 25% cover of particles smaller than stones (less than 6-7 cm) and a vegetative cover less than 30% (Cowardin, et al 1979). The project site experiences two low and two high tides per day, as a general rule.



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Common benthic invertebrates expected to inhabit the 150 foot construction zone include mollusks, polychaetes, oligochaetes, nematodes, and amphipods. The abundance and diversity of the benthic population depends on water quality, clarity, salinity, temperature, substrate, and other factors. Detailed site surveys would be conducted during the permit phase of the project to assess the nature of these resources.

Fish, crustaceans, and other aquatic species are expected to occur in the vicinity of the seawall. These species are common in the river and are mobile, and they have the ability to move out of an area when a disturbance occurs.

Based on discussions with National Park Service staff and a review of available aerial photography, there appear to be no seagrasses in the vicinity of the of the seawall (National Park Service, 2007c). More detailed surveys would be conducted during the permit phase of the project to confirm whether these resources are actually present within the two construction areas.

A small, sparsely vegetated strip of smooth cord grass (*Spartina alterniflora*) is present on the northern terminus of the seawall construction zone. Smooth cord grass is an ecologically valuable emergent aquatic species that grows in tidal areas, and is abundant in the salt marshes and tidal flats elsewhere in the estuary. Although smooth cord grass is not considered to be a seagrass, the presence of the smooth cord grass indicates that this portion of the seawall construction zone would be considered jurisdictional wetlands as per 33 Code of Federal Regulations, Part 328(b). Wetlands is discussed in a separate section of the Affected Environment chapter.

The National Marine Fisheries Service has identified the Matanzas River as Essential Fish Habitat. Fish habitat, or the geographic area where the species occur at any time during its life, can be described by ecological characteristics, location, and time. Essential Fish Habitat includes waters and substrates that determine distribution; for example, coral reefs, marshes, or submerged aquatic vegetation, and other less distinct characteristics such as turbidity zones, salinity gradients, and water quality variation. Habitat use may change or shift over time due to climatic changes, human activities, and impacts, and/or other factors such change in life history stage, species abundance, competition from other species, and environmental variability in time and space. The type of habitat available, its attributes, and its functions are important to species productivity, diversity, health, and survival (National Marine Fisheries Service, 2004). Based on a review of the available information, it appears that the area within the construction zone is Essential Fish Habitat for pink, white and brown shrimp, red drum, gray and mutton snapper, Spanish mackerel, and bluefish ((National Marine Fisheries Service, 1999). The habitat essential to these species is the estuarine water column and the associated salinity regimes, and the mud or sandy bottom of the estuary.

Oyster reefs and shell banks are also regulated as Essential Fish Habitat. These areas can be defined as the natural structures found between (inter-tidal) and beneath (sub-tidal) tide lines that are composed to oyster shell, live oysters, and other organisms that are discrete, contiguous, and clearly distinguishable from scattered oysters in marshes and mudflats. It is not known whether oysters inhabit the two construction areas. A detailed survey of the construction zones would be conducted during the permit phase of the project, to identify the extent of oysters within the construction areas.

## WATER QUALITY

The Castillo de San Marcos National Monument borders the Matanzas River, a major water body located in St. Johns and Flagler counties on the northeast coast of Florida. It is not a true river but a narrow, saltwater estuary system, sheltered from the Atlantic Ocean by Anastasia Island. The Matanzas River is roughly 20 miles in length and extends from St. Augustine Inlet in St. Augustine, Florida, southward to approximately 8 miles south of the Matanzas Inlet on the southern tip of Anastasia Island. The river is part of the Intracoastal Waterway and is located within the Northern Coastal Basin of the St. John's River Water Management District. The St. John's River Water Management District monitors water quality in the basin.

Water quality in the Matanzas River is considered good, but has been degrading due to urban runoff, other sources of sediment loading, and high coliform bacteria levels (St. Johns Water Management District, 2007). The river is designated as Class II waters, which is defined as suitable for "Shellfish Propagation or Harvesting." The declining water quality has resulted in conditional approval warnings in some areas of the basin, including the St. Augustine area.

The area of potential effect for water quality is the section of the Matanzas River within 1/8 mile of the Castillo de San Marcos National Monument historic seawall

## SPECIAL STATUS SPECIES

There are no special status species known to occur within the limits of the park, but protected species are known to inhabit or potentially may inhabit the Matanzas River adjacent to the park. These species are listed in Table 4 and discussed in the following paragraphs. The area of potential effect for special status species is the section of the Matanzas River within the vicinity of the Castillo de San Marcos National Monument historic seawall from the top of the seawall to 150 feet eastward into the Matanzas River.

**Table 4. Listed Species Potentially Occurring in the Vicinity of the Park**

Scientific Name	Common Name	Federal Status	Federal Agency with Jurisdiction
<b>Mammals</b>			
<i>Trichechus manatus</i>	West Indian manatee	Endangered	USFWS
<b>Reptiles</b>			
<i>Caretta caretta</i>	Loggerhead turtle	Threatened	USFWS/ NMFS
<i>Chelonia mydas</i>	Green sea turtle	Endangered	USFWS/ NMFS
<i>Dermochelys coriacea</i>	Leatherback turtle	Endangered	USFWS/ NMFS
<i>Eretmochelys imbricata</i>	Hawksbill sea turtle	Endangered	USFWS/ NMFS
<i>Lepidochelys kempii</i>	Kemp's Ridley sea turtle	Endangered	USFWS/ NMFS

**West Indian Manatee.** The manatee is listed by federal and state agencies as an endangered species due to declines in populations largely due to injuries from collisions with boat hulls and propellers. Manatees have been observed in the Matanzas River, but not in the vicinity of the park's seawall because there are no foraging or breeding areas for the mammals in this area and the water is very shallow. While there is smooth cord grass in the area, the project area does not support the seagrasses that comprise the majority of the manatee diet, and the boating traffic and recreational activities that occur in the vicinity discourage the use of the area for breeding.

**Sea Turtles.** Sea turtles are listed by federal and state agencies as endangered or threatened primarily because of the loss of nesting habitat or human disturbance of nests or nesting activity (National Oceanic and Atmospheric Administration, 2007). The five sea turtles listed in Table 4 are known to occur in the Matanzas River, but not in the vicinity of the park's seawall. Sea turtles require sandy beaches with soft sand or dunes well above the high tide elevation for nesting purposes, and they forage predominantly on seagrasses and the invertebrates that live in the seagrass beds and coral reefs in shallow water along the Florida coast and estuaries. As stated previously, there is smooth cord grass in the project area, but seagrass is not evident in the area. One of the largest loggerhead sea turtle nesting beaches on the Atlantic Ocean is located in nearby Fort Matanzas National Monument, approximately 14 miles south of the park. Loggerhead turtles feed on mollusks and crustaceans found in coral reefs and deep water wrecks. The loggerhead sea turtle would not likely be found in the vicinity of the Castillo de San Marcos seawall due to the lack of nesting or foraging habitat.

The green sea turtle also nests on the Fort Matanzas beaches south of the Castillo de San Marcos National Monument, although very rarely. The green sea turtle is a vegetarian and feeds on seagrass and seaweed. This sea turtle would not likely be found in the vicinity of the Castillo de San Marcos National Monument seawall due to the lack of nesting or foraging habitat.

One leatherback sea turtle nested on the beach at Fort Matanzas National Monument, in 2004. This large turtle feeds mainly on pelagic jellyfish. It is highly unlikely that a leatherback turtle would be encountered in the vicinity of the Castillo de San Marcos National Monument seawall. In addition, the hawksbill and Kemp's Ridley turtles do not nest in the area and are very rarely observed in the vicinity.

## **CULTURAL RESOURCES**

### **Historical Background**

Humankind has occupied the area now known as Florida for perhaps 10,000 years. However, it was not until the early 1500s that Spanish and French colonizers sought to establish permanent European settlements in this part of Florida, then occupied by the Timucua Indians. In 1564 the Spanish admiral Pedro Menéndez de Aviles captured the French-occupied Fort Caroline. In cooperation with Chief Seloy of the Timucua, Menéndez established a colony at the Timucuan settlement. It was not long before relationships deteriorated, and the Spanish settlement was moved to Anastasia Island, where it remained for six years before moving to the present location of St. Augustine.

In 1576, following Menéndez's death, the colony became a Spanish crown colony that provided a safe haven for shipwreck victims, a strategic position in guarding the route of the Spanish treasure fleets, and a base from which to salvage wrecked ships' cargoes. Beginning with establishment of the colony, nine different wooden forts were built to protect the inhabitants, but these forts failed due to time, weather, and insects. Over the next quarter century, the settlement also was badly damaged or partially destroyed by mutinies, erosion by the sea, and

Indian attacks. English privateer Francis Drake burned St. Augustine to the ground in 1586; the rebuilt town was destroyed again by a disastrous fire and major hurricane in 1599.

During the 17<sup>th</sup> century, the impoverished colony of St. Augustine was neglected by the Spanish rulers, and continued to be beleaguered by epidemics and pirate attacks, as war in Europe and threats to Spanish holdings by other European powers occupied the Spanish government. An attack in 1668 by pirate John Davis finally triggered Spanish approval for construction of a masonry fortress at St. Augustine.

Like its earlier wooden counterparts, the stone fortress of Castillo de San Marcos was built using the bastion system, a system that had evolved out of the medieval castle form, with its distinctive shape, lowered castle walls, earthen ramparts, moats, and outer works built of masonry. The site of the existing fortress was selected as most appropriate for the defense of St. Augustine (enemy fleets entering the harbor could be bombarded from the fort, and the site was advantageous for defense from the landward side). An engineer, master of construction, and masons, stonecutters, and lime burners recruited from Havana; joined convicts, local Indians, slaves and Spanish soldiers to begin construction of the fortress in 1672 (National Park Service, 1997). The main block of the Castillo, including outer curtain walls and bastions, was completed by 1686, and the moat and the original seawall were completed by 1696. The seawall and other structures were constructed of soft limestone known locally as coquina (meaning “tiny shell” in Spanish). Coquina is made up of broken shells and sand cemented together by calcium carbonate, which essentially forms a natural type of concrete.

In 1702, during the War of Spanish Succession between England and Spain, Governor James Moore of Carolina occupied St. Augustine, hoping to drive the Spanish out of Florida. Local residents fled to the fort for protection during the 50-day siege that ended when Spanish reinforcements arrived from Cuba. Moore burned St. Augustine; only the Castillo de San Marcos survived.

Over the next few years as English power grew in the region, the fortress was furthered strengthened by addition of log and earth defensive structures. Another English attack in 1740 besieged the Castillo de San Marcos for 38 days but ended with the onset of the hurricane season. Additional construction on masonry structures at the fort continued until funding ran out in the 1750s; in 1762, local residents helped enlarge and strengthen the fort.

The end of the Seven Years War (the French and Indian War) resulted in Spanish evacuation of St. Augustine, and the Castillo de San Marcos was officially surrendered to England in July 1763. During the American Revolution, St. Augustine housed a British garrison, loyalists from the southern colonies, and the fort was used as a prison for rebel colonists (National Park Service, 1997). Following the war, Florida returned to Spanish control, and most English settlers left the colony. However, a number of non-Spanish settlers stayed on, joining a diverse group of Euro-American immigrants, free blacks, slaves, and Native Americans in St. Augustine. With the outbreak of the French Revolution, Spanish colonies in the Americas suffered from lack of resources, but threats of American and French attacks against East Florida resulted in additional improvements to the city and the fort.

After the Louisiana Purchase in 1803, the American government claimed possession of West Florida. Although the Spanish attempted to retain control of the area, American citizens dominated the population, and in 1811, the United States annexed the portion of West Florida lying west of the Perdido River. Land-hungry Georgians hoping to oust Spain from the rest of Florida advanced on St. Augustine, but were rebuffed by Seminole allies of the Spanish.



Continued American threats to the Spanish eventually resulted in American acquisition of the rest of Florida in 1821 in return for the retirement of Spanish debts owed American citizens (National Park Service, 1997). As one of the U.S. Army's territorial outposts, a garrison at St. Augustine occupied Castillo de San Marcos, and in 1825, the War Department changed the name of the Castillo to Fort Marion, in honor of American Revolutionary War General Francis Marion (National Park Service, 1997). The fort's numerous structural problems made it uninhabitable, so the garrison was housed in the St. Francis barracks, built during the British period, and Fort Marion was used to store supplies and provisions. Several casemates were used as a local prison.

The 1830 Indian Removal Act helped trigger the Second Seminole War, with St. Augustine serving as an important base of operations for the United States Army. The fort also served briefly as a prison for Seminole warriors, including King Philip, Coacoochee, Blue Snake, Osceola, and Coa Hadjo, Indian leaders captured during the fall of 1837. Coacoochee and nineteen others escaped from the fortress prison in November, and others who did not escape were later sent to Fort Moultrie in South Carolina for safekeeping.

Prior to the Second Seminole War in 1835, the U.S. War Department did little to maintain the fort, for officials did not view Fort Marion as essential to national security. Military engineers considered the fort a solid, defensible work, but they also believed the bastioned design of the fortress was outdated. In addition, the War Department officials observed that St. Augustine did not hold a position of strategic significance in Florida, as the territorial capital had moved to Tallahassee in 1824 and large ships found Matanzas Bay difficult to access.

As a result, the War Department made few efforts to improve the fortress in the early years of occupation. Part of the seawall had been dismantled by the United States to construct a wharf near St. Francis Barracks, resulting in severe erosion problems. As the seawall began to deteriorate, local citizens pillaged the seawall for personal use of its stones. In 1832, local citizens protested the Army's neglect of the fort and petitioned Congress to repair the fort and reconstruct the city's seawall. The fort's seawalls were "leaning and tottering" and the fort is "going rapidly to ruin, its walls at one or two points are falling into the sea" (National Park Service 1983). Congress allocated \$20,000 the same year to make needed repairs to the structures. The seawall received top priority in the expenditure of funds because of the breach that threatened property and lives in town. The Army Corps of Engineers directed the reconstruction of the seawall. Lieutenant Stephen Tuttle (1833 to 1834), Francis S. Dancy (1834 to 1839), and Henry Benham (1839 to 1844) were involved in the seawall reconstruction.

In his initial analysis, Tuttle found that the fort's "outwork" had been undermined by the sea, and had partially collapsed (National Park Service, 1983). As built, the seawall was designed for protection of the fort's glacis and nearby public property. However, local citizens wanted the United States to build a new seawall out to the stone wharf fronting the barracks. Tuttle estimated that the seawall needed to be rebuilt for approximately two-thirds of its length (approximately 600 feet), but was warned by Washington that the funding was intended only to repair the seawall, not to alter its location.

However, work went slowly, and a series of incidents involving cost overruns for obtaining the coquina and transporting it to the fort, errors in judgment, and public drunkenness led to a court martial of Lieutenant Tuttle for conduct unbecoming to an officer and neglect of duty. Upon taking over the project from Lieutenant Tuttle, his successor Lieutenant Francis Dancy, found that the old seawall had a foundation in many locations, but the foundation generally was

not buried under the surface of the sand. The poorly constructed masonry in the wall allowed water to flow freely between the joints of the stone, both vertically and horizontally. During high tide, the water penetrated the wall and was 2 to 4 feet deep on the landward side of the wall (National Park Service, 1983).

In addition, the new stones that had been laid on the old foundations were now leaning and unstable because the foundations “had been undermined until they inclined outward one or two degrees.” Lieutenant Tuttle apparently had ignored basic principles of masonry, resulting in a wall without solidarity or symmetry (National Park Service, 1983).

Most of the original \$20,000 appropriation had already been expended, so in 1836 Congress appropriated another \$50,000 for repair of Fort Marion and reconstruction of the seawall (National Park Service, 1983). Lieutenant Dancy, now superintendent of the project, recommended relocation of the seawall about 30 feet farther east in a straight alignment, including the 870-foot section completed under Lieutenant Tuttle. Lieutenant Dancy’s supervisor, Lieutenant Mansfield, approved the change in wall alignment and provided guidelines for the new wall:

- Stone was to come from Anastasia Island
- Riprap was to be placed to protect the fort’s water battery
- A “new seat and direction” was to be given to the wall fronting St. Augustine
- The city seawall was to extend 1-1/2 feet above flood tide, be 5 feet thick at the base and 3 feet at the top, with a slope of 1 inch to the foot, and rest on a 7 foot by 2 foot thick foundation.
- Masonry was to be laid in good mortar containing one quarter hydraulic cement, (National Park Service, 1983).

Early in January 1837, work began with dismantling of the Spanish and Tuttle walls with the expectation that Congress would approve this modification of the project. Unfortunately, Congress failed to sanction relocation of the walls, noting that the funding was to be used only to repair the wall, not to replace it in a new location. Work progressed, however, because the old walls had already been dismantled. After a year of political wrangling, Lieutenant Dancy was replaced by Lieutenant Henry Benham of the U.S. Army Corps of Engineers. Over the next 5 years, numerous delays in the project were created by local politics, lawsuits, storm damage, and yellow fever.

The new seawall was made from coquina stone and cemented with tabby. The coquina stone was thought to be “superior to the best brick in the Nation’s First and Second System Forts” for its strength and resistance to splintering (National Park Service, 1983). The seawall was extended from Fort Marion south to a point 500 feet south of the St. Francis Barracks, or a distance of approximately 3,800 feet. Granite blocks were placed atop the coquina to the high water mark, for both practical and aesthetic purposes. The outbreak of the Second Seminole War had forced the government to reevaluate the importance of Fort Marion within the coastal defense system, and additional expenditures for construction of a water battery were approved in 1842. Workers filled the moat between the east curtain wall and the seawall, building gun emplacements on the battery terreplein facing the harbor. They also built a hot shot furnace, which was used to heat iron cannon balls for firing at flammable targets like wooden ships. The completion of the water battery and hot shot furnace ended construction projects at Fort Marion. As such, they

represent the military thinking prevalent at the time of their construction. They complement the Castillo de San Marcos, demonstrating the evolution of military engineering and technology. Work on the fort was completed in 1846 (National Park Service, 1983).

Although Fort Marion was part of the nation's coastal defense system, it lacked a garrison to man its guns. Only a single elderly caretaker occupied the fort when Confederate troops came to take over the fort in 1861. Fort Marion's guns were shipped northward to Confederate forces but the fortress remained well outside of the main war theaters. When Union gunboats appeared in the harbor in March 1861, the Confederate troops departed the city, and federal occupation of the city continued after the Confederate surrender, well into the Reconstruction period. In 1866, the government declared that although the fort was nonessential to the nation's defenses, it should be maintained. Therefore, the garrison at St. Augustine made needed repairs to the fort in preparation for its use as a prison.

Western migration of settlers and gold seekers resulted in numerous conflicts over land and resources. Ultimately, Indian tribes were removed to reservations by the U.S. Army, but at first, many refused to leave, and fought to retain their homelands. Beginning in the early 1860s and continuing through the 1880s, the Western Indian wars generated a number of Indian captives. Thousands of Indians from the Great Plains were removed to reservations in Oklahoma. Seventy-four of these individuals, mostly male warriors from the Cheyenne, Kiowa, Comanche, Caddo, and Arapaho tribes, had been convicted of murder and rebellion without a trial (National Parks Conservation Association, 2006). They were transported by wagon, rail, and steamboat, arriving at Fort Marion on May 21, 1875.

The captives were escorted by Lieutenant Richard H. Pratt, who previously had been the head of an African-American unit led by white officers. During the first six months, Lieutenant Pratt made major changes in the prisoners' lives by removing chains and shackles, and improving living facilities. Lieutenant Pratt directed construction of a wooden shed on the terreplein to house the prisoners (National Park Service, 1997). Some of the young Indians were used as guards, and he took the men on camping and fishing trips to Anastasia Island. Lieutenant Pratt set up a school to educate and assimilate the Indians by teaching them arithmetic, history, and English, as well as vocational skills. The Indians were encouraged to create souvenirs to sell to tourists to provide some income.

In 1886 and 1887, 447 Apache prisoners from Arizona were sent to Fort Marion and were also educated in a special school. After a year of captivity in Florida, the prisoners were shipped to a reservation in Oklahoma.

Fort Marion became a favorite tourist destination as visitors enjoyed the European flavor and the Spanish Colonial Architecture of the fort and the surrounding area. Recognizing the importance of the structure, Congress appropriated \$5000 for restoration and preservation of the Castillo de San Marcos in 1884. Later appropriations in 1888 and 1890 aided additional preservation efforts. The original appropriation "established a little known precedent for the expenditure of federal monies to preserve an historic structure" (National Park Service, 1997). After a disastrous fire destroyed most of St. Augustine's downtown, the local historical society began to use several casemates at the fort for its collections and for tours. This arrangement continued until 1933 when the fort came under the management of the National Park Service.

### **Historic Structures**

Along with other features of Castillo de San Marcos, the seawall is an historic property associated with the context, "The United States War Department at Fort Marion, 1821-1933." The

Castillo de San Marcos served as a military base of operations during the Second Seminole War and the American Civil War. The structure represents the continued use of the fort as a defensive structure throughout the nineteenth century and into the twentieth century and illustrates the evolution in military architecture, engineering, and technology. Castillo de San Marcos was the principal military fortification in the region from 1672 to 1900, and was occupied by four different armies (Spanish, English, and the Confederate and Union armies of the American Civil War).

The seawall was reconstructed between 1833 and 1844 in an attempt to update the Castillo de San Marcos and make it a contributing part of the nineteenth century coastal defenses.

Reconstruction of the seawall by the U.S. Army was needed to protect both the fort and the city from storms and erosion, as well as to allow the construction of the water battery. The water battery and hot shot furnace were built in response to the Second Seminole War and national attempts to prepare the coastline should a naval attack occur. Their construction reflects the military design and viewpoint at the time. The fort and its associated structures were also a significant part of the development of tourism in St. Augustine, and their preservation marks early commitment by the U. S. government to the preservation of historic structures under its management.

The seawall is an independent structure worthy of listing as a contributing resource to the Castillo de San Marcos National Monument, which is eligible for the National Register of Historic Places. The seawall demonstrates integrity of location, setting, materials, workmanship, feeling, and association.

The area of potential effect for historic structures is the seawall and the fort.

### **Cultural Landscape**

The designed landscape at Castillo de San Marcos National Monument has not been formally designated as a cultural landscape through completion of a Cultural Landscape Report. However, the visual qualities of the historic scene at the park encompass numerous features generally included in a historic cultural landscape. For example, landscape elements include water features such as Matanzas River, the St. Augustine inlet and Anastasia Island across the river, the various Spanish-style fort structures that reflect the fort's long history, the several access corridors (both within the park and leading outside the park), the surrounding landforms, the vegetation, and viewsheds. These various landscape elements provide a composite view of centuries of local history embodied in the gradual historic development of and modifications to the overall landscape.

Within this landscape, the proposed project would affect the visual appearance of the Matanzas River side of the seawall, and the viewshed, both as seen looking outward from the Castillo de San Marcos National Monument across the Matanzas River, and from the river looking west toward the fort.

### **VISITOR USE AND EXPERIENCE / VIEWSHED**

#### **Visitor Use and Experience**

Castillo de San Marcos is the oldest remaining European fortification in the continental United States and it is located in the "nation's oldest city". The fort was built just over one hundred years after the founding of the city of St. Augustine by the Spanish in 1565. Its bastioned design represents the conventions of military architecture and technology of its day. In addition, St.

Augustine has an historic downtown, 43 miles of beaches and a mild, Florida climate. As a result, the St. Augustine area is a major tourist attraction.

In 2002, the University of Florida conducted a visitors' survey for the St. Johns County Tourist Development Council (University of Florida, 2002). The survey indicated that the city of St. Augustine attracts an estimated 6.2 million visitors each year. Over 40 percent of these visitors were from Florida. More than 66 percent of those surveyed were overnight visitors and the mean length of stay was 3.8 days. Approximately 54 percent of the visitors were repeat visitors. Spring was the most popular time to visit St. Augustine. Approximately 90 percent of the visitors were very satisfied with their experience in St. Augustine and approximately 36 percent said their experience was perfect.

Annual visitation to the park was 600,252 in 2005 (National Park Service, 2006b). This figure includes not only paid attendance, but also an estimate of non-paying visitors to the grounds of the park, as well as people visiting the park for special events. During the five previous years from 2000 to 2004, annual attendance ranged from a low of 613,465 in 2001 to a high of 668,298 in 2002. The peak attendance at the park was in 1992 when 808,780 visitors were reported.

During the last five years, July has been the peak visitation month at the park with 12.5 percent to 14.6 percent of the annual visitation. March and April trade over the five year period as the second highest visitation month with 10.5 percent to 12.4 percent of the annual visitation. May and June trade over the five year period as the fourth highest visitation month with 8.5 to 9.5 percent of the annual visitation. September is consistently the lowest visitation month of the year with 2.5 to 4.6 percent of the annual visitation. School groups account for roughly 10 percent of the visitors to the fort. Ninety percent of those groups are made up of elementary and middle school students. School visitation is heaviest in April and May. Short bursts of heavy visitation are also associated with the Christmas/New Year holiday period and activities in St. Augustine, Jacksonville, and Daytona Beach such as Bike Week and the Daytona 500. However, as a general rule, visitation peaks on weekends with Tuesday, Wednesday, and Thursday being slower days (National Park Service, 2006c).

Visitors that enter the fort have the opportunity to participate in ranger led programs and self-guided tours. Casemates inside the fort are accessible to visitors for interpretation purposes. In these areas, visitors can read wayside exhibits and view soldiers' quarters as they would have appeared during the colonial period. In the casemate adjacent to the sally port entrance, Eastern National operates a small gift shop. A survey conducted for guidance on reporting official visitation statistics revealed that 12 percent of all visitors who stopped at the entrance booth did not enter the fort (National Park Service, 2006c). Staff estimates that 15 percent of all visitors come for recreation and these visitors do not enter the fort or make inquiries at the information booth. These visitors may use the grounds for a picnic or to enjoy a walk or an impromptu football game. Other visitors walk along the seawall and gaze to the east over Matanzas Bay to view the extraordinary scenery, as well as marine activity on the Matanzas River, the adjoining Matanzas Bay, and the St. Augustine inlet. Many fishermen fish in the river from the seawall and a few fishermen climb over the seawall to wade fish in this area of the Matanzas River.

The area of potential effect for visitor use is the park and the saltwater flats adjacent to the park.

### **Accessibility for Visitors**

Most of the first floor of the Castillo de San Marcos National Monument is wheelchair accessible. However, the top gundeck is unavailable to persons in wheelchairs. Accessible parking is available in the parking lot, as are spaces for busses for short term parking.

Brochures on the history of the fort are available in several foreign languages. A large bronze model of the fort located in the Sallyport (entranceway) enables visually challenged visitors to feel the outlines of the fortress. An audio/visual room on the first level of the fort provides opportunities for viewing live demonstrations taking place on the gun deck (second level of the fort) for visitors who have difficulty accessing the gun deck.

### **Viewshed**

The viewshed from the park is extraordinary. From the second floor of the fort, the visitor can look to the east to view the Matanzas River, the St. Augustine inlet, the Atlantic Ocean, and Anastasia Island. From this viewpoint, the visitor can imagine how a Spanish soldier felt over 300 years ago as an enemy ship approached the fort from the St. Augustine inlet. The view to the south would encompass the Bridge of Lions that provides access between the mainland and Anastasia Island, South Castillo Drive, and part of historic St. Augustine. The view to the east would show additional parts of historic St. Augustine, South Castillo Drive and other streets, as well as the park grounds and the park headquarters. The view to the north encompasses residential waterfront property and the Matanzas River.

From the historic seawall, the view to the east provides a different perspective of the view from the fort. The visitor not only sees the river and Anastasia Island, but can also see the details of the historic seawall, including the coquina base and the granite overlay.

Therefore, the area of potential effect for the viewshed is the local area of St. Augustine that surrounds the fort, including Anastasia Island and the Matanzas River.

### **SOUNDSCAPE / NOISE**

The Castillo de San Marcos National Monument is located in the historic downtown area of St. Augustine, Florida. St. Augustine is a city with a population of nearly 12,000 in 2003 and is located within the Jacksonville metropolitan area (Epodunk, 2007). The University of Florida estimated that the city of St. Augustine attracted an estimated 6.2 million visitors in 2002 (University of Florida, 2002), most of whom visited the historic district.

An arterial highway borders the west side of the park only 400 feet from the entrance to the fort. As a result, the soundscape in the area surrounding the fort is that of an urban community. The soundscape is composed of primarily manmade sounds, including land and marine motor vehicles, people, construction equipment, and other manmade sounds. Natural sounds at the park include birds, wind, and rainfall. Waves on the Matanzas River created by wind or watercraft will make sounds as the waves lap against the seawall.

Noise monitoring was not performed at the park for this environmental assessment; however, qualitative statements provide an overview of the levels of noise at the park. The intensity of the urban sounds is not overwhelming or distracting, and is at levels that are consistent with the urban surroundings. Most visitors spend their time at the fort and the fort is located at the eastern edge of a 25 acre parcel with the majority of the urban sounds generated to the west of the parcel. Motor vehicle noise predominates at the park, and the adjacent arterial highway, San Marco Avenue, is characterized by traffic signals and low traffic speeds, which helps to lower vehicle noise levels.

The area of potential effect for soundscape/noise is the park and sections of the Matanzas River to the east of the park.

## CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

### INTRODUCTION

The environmental consequences associated with each of the alternatives are described in this chapter. It is organized by impact topic, which allows a comparison between the alternatives based on issues. Consistent with National Environmental Policy Act, the analysis also considers the context, intensity, and duration of impacts, indirect impacts, cumulative impacts, and measures to mitigate impacts. National Park Service policy also requires that “impairment” of resources be evaluated in all environmental documents associated with resource analysis.

### METHODOLOGY

#### General Evaluation Methodology

The impact analyses and conclusions presented in this environmental assessment are based on a review of available literature concerning the area, information provided by National Park Service staff, other agencies, professional judgments, and public input. The effects of the alternatives are assessed according to guidelines presented in the National Park Service guidelines for preparing National Environmental Policy Act documents (National Park Service, 2001). The context, intensity, duration, direct/indirect, and cumulative nature of effects of the No Action Alternative (Alternative A) and the viable action alternative (Alternative B – Preferred Alternative) are assessed.

The impact analyses involved the following steps:

- Define issues of concern, based on scoping;
- Identify the geographic area that could be affected (area of potential effect);
- Define the resources within that area that could be affected;
- Impose the action on the resources within the area of potential effect; and
- Identify the effects caused by the alternative, in comparison to the baseline represented by the No Action Alternative, to determine the relative change in resource conditions.

The impact assessment addresses the potential effects of construction and operation of the alternatives. The impact assessment was conducted by relating the potential effects of the following specific activities associated with each of the alternatives to existing resources on the site and in the area surrounding the site.

#### Alternative A: No Action Alternative

This alternative involves taking no action to slow the deterioration of the historic seawall. Maintenance activities, such as patching the cracks in the seawall, may occur in the future, but no structural improvements would be made to preserve the integrity of the seawall.

#### Alternative B: Preferred Alternative / Install riprap on the passive (seaward) side of the seawall

This alternative involves installing approximately 961 cubic yards of riprap to approximately 313 feet of seawall (in two sections) at the park. Riprap is composed of large rocks and small boulders that are placed on the passive (seaward) side of the seawall to provide support for the

seawall and to reduce the erosive effects of tidal actions on the seawall. The construction timeframe for completing the rehabilitation of the seawall is approximately 60 to 90 days.

Additional information regarding the alternatives is provided in the Alternatives section of this environmental assessment.

Each alternative will be analyzed with regard to the affect that Alternative A or B is anticipated to have on a particular resource. The effects are characterized based on the following factors:

- Intensity of the effect: negligible, minor, moderate, or major. Threshold values were developed based on federal and state standards, consultation with regulators, and discussions with subject matter experts. If there is no effect anticipated, this will be stated;
- Whether the effect would be beneficial or adverse;
- Duration of the effect: short term or long term, with specificity for each impact topic;
- Whether the effect would be a direct result of the action or would occur indirectly because of a change to another resource or impact topic. An example of an indirect impact would be increased mortality of an aquatic species that would occur because an alternative would increase soil erosion, which would reduce water quality.
- Context or area affected: site-specific, park-wide, local or regional.

### General Definitions

The following definitions are used to evaluate the context, intensity, duration, direct/indirect, adverse/beneficial, and cumulative nature of impacts associated with the alternatives:

The **intensity** of impacts is evaluated within the area of potential effect, or that area that has a likelihood of being impacted by the action. The intensity or severity of the impact is generally defined as negligible, minor, moderate, or major and varies by impact topic. The specific criterion for intensity for each impact topic is described in Table 2 in the Alternatives section of this environmental assessment.

Adverse or beneficial impacts are defined as follows:

**Adverse** – an effect that is contrary to the welfare of a resource.

**Beneficial** – an effect that produces or promotes a favorable result.

**Duration** of the impacts in this analysis is defined as follows, unless otherwise specified by impact topic:

**Short term** - impacts occur only during construction or last less than one year; or

**Long term** - impacts that last longer than one year.

The specific criterion for duration for each impact topic is described in Table 2 in the Alternatives section of this environmental assessment.

Direct versus indirect impacts are defined as follows:

**Direct** – an effect that is caused by an action and occurs at the same time and place. An example would be the effects of grading on soils.

**Indirect** – an effect that is caused by an action but is later in time or farther removed in distance, but still reasonably foreseeable (National Park Service, 2001). An example of an



indirect effect in time would be the impacts of growth that are related to implementation of a new highway, where none exists currently. An example of an indirect effect over distance would include air emissions from a point source that affects a receptor at some distance from the source.

**Context** is the setting within which an impact is analyzed, such as the site, the park, the local area, or a region. The area of potential effects may vary by impact topic and may also vary between construction and operation. For many impact topics, the area of potential effects may be quite localized for both construction and operation. For other impact topics, the area of potential effects may extend into the remainder of the park, the waterway, the community, or even the region.

### **Cumulative Effects Analysis Methodology**

The Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act also require an assessment of cumulative effects in the decision making process for federal projects. Cumulative effects are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 Code of Federal Regulations 1508.7).

Cumulative effects are considered for both no action and action alternatives. They are presented at the end of each impact topic analysis. Cumulative effects were determined by assessing the combined effects of each alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to first identify other past, ongoing, or reasonably foreseeable future actions in the park as well as the St. Augustine area that add to the impacts of the historic seawall rehabilitation. Due to the nature of the seawall rehabilitation project and the types of impacts that are associated with the project, only projects that are associated with the Castillo de San Marcos National Monument, tourism, or area seawall rehabilitation are considered for potential cumulative effects.

The actions considered in the cumulative effects analysis are described below.

- Historic alteration of the natural environment would include construction of the seawall at Castillo de San Marcos over 140 years ago. This seawall, as well as the original seawall constructed in the late 1600's, dramatically changed the natural environment in the vicinity of the fort.
- The St. Augustine Inlet and portions of the Matanzas River in the vicinity of the park are part of the Intercoastal Waterway and are routinely dredged by the U.S. Army Corps of Engineers to improve navigation for commercial and recreational vessels (St. Augustine Port, Waterway, and Beach District, 2007). This dredging activity has occurred in the past and will continue into the future on an as needed basis. The main channel of the Intercoastal Waterway lies approximately 1000 feet to the east of the seawall.
- A seawall rehabilitation project is planned by the city of St. Augustine for approximately 1,200 feet of historic seawall located between the Santa Maria Restaurant (located to the south of the Bridge of Lyons) and the Florida National Guard property at the intersection of Avenida Menendez and Saint Francis Street. The city plans to rehabilitate this section of the seawall by constructing a second seawall approximately 11 feet seaward of the historic seawall. A promenade would be created by placing fill in the void and

surfacing with coquina pavers. Only the top of the historic seawall would be above ground, and this would serve as seating.

- A four story, 1,000 car parking garage was constructed in July 2006 to serve the historic district of St. Augustine. The garage is located a short walk to the northwest of the park and relieves some of the surface parking demand in the historic district, outside the park. The garage was constructed in an architectural style that is compatible with the St. Augustine historic district.
- While not currently funded or programmed for construction, the Castillo de San Marcos General Management Plan (National Park Service, 2006a) identifies several improvements to the park.
  - A new visitor center for the park would be constructed in the Spanish Quarter of St. Augustine. Land for the project would be sought through donation.
  - A portion of the existing visitor parking lot would be removed and the area would be contoured and grassed to match the existing fort green and glacis. The specific size and configuration of the revised parking facility would be determined in a later planning and design phase.
  - Three casemates in the fort would have their non-historic administrative uses removed and the resulting rooms would be returned to their previous condition and made available for interpretive uses.
  - The sidewalk along Highway A1A would be widened slightly to improve the safety of visitors walking from the new city parking garage to the park entrance.
  - The ticket booth and sales function would be relocated away from the fort.

### Impairment Analysis Methodology

In addition to determining the environmental consequences of the preferred and other alternatives, the National Park Service *Management Policies - 2006* (National Park Service, 2006d) and Directors Order 12 (National Park Service, 2001), require analysis of potential effects to determine if actions would impair park resources.

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 park resources and values. National Park Service managers must always seek ways to avoid or minimize to the greatest degree practicable adverse impacts on park and monument resources and values. However, the laws do give National Park Service management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given National Park Service management discretion to allow certain impacts within parks, that discretion is limited by statutory requirement that the National Park Service must leave park 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 National Park Service manager, would harm the integrity of park resources or values, including opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute impairment. However, an impact would more likely 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 park;
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- Identified in the park's general management plan or other relevant National Park Service planning documents as being of significance.

Impairment may result from National Park Service activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park.

A determination of impairment is made for each relevant impact topic within each "Conclusion" section of this environmental assessment under "Environmental Consequences."

## CULTURAL RESOURCES METHODOLOGY

### Methodology for Assessing Impacts to Cultural Resources

Potential impacts (direct, indirect, and cumulative effects) are described in terms of type (beneficial or adverse effects), context (site-specific, park-wide, local, or regional effects), duration (short-term, long-term, or permanent effects) and intensity (negligible, minor, moderate, or major effects). Because definitions of intensity may vary by impact topic, intensity definitions are provided separately for each cultural resource impact topic (historic structures and cultural landscapes) analyzed in this environmental assessment. This information is included in the General Evaluation Methodology previously discussed in this section.

**Impacts to Cultural Resources and §106 of the National Historic Preservation Act:** In this environmental assessment, impacts to cultural resources are described in terms of type, context, duration, and intensity, which is consistent with the regulations of the Council on Environmental Quality that implement the National Environmental Policy Act. These impact analyses are intended, however, to comply with the requirements of both the National Environmental Policy Act and §106 of the National Historic Preservation Act. In accordance with the Advisory Council on Historic Preservation's regulations implementing §106 of the National Historic Preservation Act (36 CFR Part 800, Protection of Historic Properties), impacts to cultural resources were also identified and evaluated by (1) determining the area of potential effects; (2) identifying cultural resources present in the area of potential effects that are either listed in or eligible to be listed in the National Register of Historic Places; (3) applying the criteria of adverse effect to affected, National Register eligible or listed cultural resources; and (4) considering ways to avoid, minimize or mitigate adverse effects.

Council of Environmental Quality regulations and the National Park Service's *Conservation Planning, Environmental Impact Analysis and Decision Making* (Director's Order #12) also call for a discussion of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g. reducing the intensity of an impact from major to moderate or minor. However, any resultant reduction in intensity of impact due to mitigation is an estimate of the effectiveness of mitigation under the National Environmental Policy Act only. It does not suggest that the level of effect as defined by §106 is similarly reduced. Cultural resources are non-renewable resources and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under §106 may be mitigated, the effect remains adverse.

A §106 summary is included following the cultural resource impact analysis. The §106 summary is an assessment of the effect of the undertaking (implementation of the Preferred Alternative) on National Register eligible or listed cultural resources only, based upon the criterion of effect and criteria of adverse effect found in the Advisory Council's regulations. The §106 criteria for characterizing the severity or intensity of impacts are the determinations of effect: *no historic properties affected*, *no adverse effect*, or *adverse effect*.

- A determination of no historic properties affected means that either there are no historic properties present or there are historic properties present but the undertaking would have no effect upon them.
- A determination of no adverse effect means there is an effect, but the effect would not meet the criteria of an adverse effect; i.e., diminish the characteristics of the cultural resource that qualify it for inclusion in the National Register. A no adverse effect finding also may include beneficial effects of an action.
- An adverse effect occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for inclusion in the National Register; e.g., diminishing the integrity (or the extent to which a resource retains its historic appearance) of its location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the alternatives that would occur later in time, be farther removed in distance or be cumulative. Because cultural resources are nonrenewable, all adverse effects on National Register-eligible cultural resources would be long term and have a high level of concern.

Impact threshold definitions were previously discussed for each of the following cultural resource topics (historic structures and cultural landscapes) to help ensure that the intent and legal requirements of both the National Environmental Policy Act and the National Historic Preservation Act are met in this document. Note that all unevaluated cultural resources would be considered eligible for the National Register of Historic Places until evaluation is completed.

### **Methodology for Historic Structures**

To be listed in the National Register of Historic Places, a structure or building must meet the following criteria:

- Be associated with an important historic context. That is, it must possess significance such that a meaning or value is ascribed to the structure or building.
- Have integrity of those features necessary to convey its significance. Typically, these would include location, design, setting, workmanship, materials, feeling, and national association.

Complete information on criteria for listing is included in National Register Bulletin #15, *How to Apply the National Register Criteria for Evaluation*. Impacts on historic structures were evaluated using the process described in the beginning of this section.

### **Methodology for Cultural Landscapes**

The landscape at Castillo de San Marcos National Monument has not been formally inventoried or evaluated as a cultural landscape. However, the location of the park, its topography, access roads and trails, the types and arrangement of the various structures (including the seawall), the vegetation, and the viewshed are a complex subset of cultural resources resulting from the interaction between people and the land, and reflect the influence of human beliefs and actions

over time on the natural landscape. Such a landscape is a living record of the area's past, providing a visual chronicle of its history. For these reasons, the landscape at Castillo de San Marcos will be treated as a cultural landscape in this environmental assessment.

For a cultural landscape to be listed in the National Register, it must possess significance (the meaning or value ascribed to the landscape) *and* have integrity of those features necessary to convey its significance. The character-defining features of a cultural landscape include spatial organization and land patterns; topography; vegetation; circulation patterns; water features; and structures or buildings, site furnishings, and objects. Impacts on cultural landscapes were evaluated using the process described at beginning of this section.

The following sections provide an assessment of the effects of the No Action Alternative and the Preferred Alternative, using the methods described previously.

## **AIR QUALITY**

### **Alternative A (No Action Alternative)**

Under this alternative, no action would be taken to repair the seawall. The No Action Alternative would result in no effects to air quality in the park. Existing air quality conditions would be expected to prevail.

**Cumulative Effects.** The original construction of the historic seawall at the park would have no adverse or beneficial, long-term or short-term, direct or indirect, local or regional effect on air quality in the area. The dredging of the Intercoastal Waterway in the area near the park would have a negligible, adverse, long-term and short-term, indirect, local effect on air quality in the vicinity of the park due to the operation of diesel engines during the dredging operation. The St. Augustine seawall rehabilitation would have a negligible, adverse, short term, indirect, local effect on air quality in the area south of the park and no adverse or beneficial, long-term, direct or indirect, local or regional effect on air quality at or near the park. The new parking garage could affect air quality at the park when winds are from the northwest, but impacts would be negligible, adverse, long term, indirect, and local. The projects proposed in the general management plan could affect air quality at the park due to reduced parking on the site, but cumulative impacts to air quality would be negligible beneficial, long term, indirect, and local. Overall, when effects of other past, present, and future plans, projects, and activities affecting air quality are combined with the effects of actions under Alternative A, cumulative, negligible, adverse, long-term and short term, local effects would occur.

**Conclusion.** The implementation of Alternative A would result in no effects to air quality in or near the park. Overall, when effects of other plans, projects, and activities affecting air quality are combined with these effects of actions under Alternative A, cumulative, negligible, adverse, long-term and short term, local effects would occur. Alternative A would not produce major adverse effects on air quality whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to air quality as a result of the implementation of Alternative A.

### **Alternative B (Preferred Alternative)**

The Preferred Alternative would involve placing riprap on the passive (seaward) side of two sections of seawall at the park. The air quality effects experienced at the park would be

dependent on the wind direction. As the engines that operate the excavation equipment would be located on a barge that would primarily be located to the southeast of the fort (where visitors spend most of their time at the park), the emissions from the excavation equipment would mainly affect visitors at the park when winds are from the southeast. Prevailing wind information from 1961 to 1990 indicated that the months from March to August were most likely to have winds from the southeast (United States Department of Agriculture, 2006). The winter months, particularly November through February, were most likely to have winds from the northwest that would carry the exhaust emissions from the excavation equipment away from the fort. Therefore, anticipated impacts during construction would be negligible, adverse, short term, indirect, and local if construction occurs during the winter months. Anticipated impacts during construction would be minor, adverse, short term, indirect, and local if construction occurs during the spring or summer months. The dump trucks that are used to transport the riprap to the barge would have a negligible, adverse, short term, indirect, regional effect on air quality. Once construction is completed, there would be no effects on air quality at the park due to Alternative B.

Reducing the effects of Alternative B on air quality would include best management practices, such as turning off the excavator and tugboat engines when not in use and ensuring that the engines are in proper working order to reduce emissions. In addition, air quality effects at the park could be reduced by constructing Alternative B during the months of November to February, when the winds are from the northwest and would carry the emissions away from the park over the Matanzas River.

**Cumulative Effects.** The cumulative effects of other past, present, and future projects affecting air quality in the area are the same as those described for Alternative A. Overall, when effects of other past, present, and future plans, projects, and activities affecting air quality are combined with the effects of actions under Alternative B, cumulative, negligible to minor, adverse, short term, indirect effects would occur.

**Conclusion.** Anticipated impacts during construction of Alternative B would be negligible, adverse, short term, indirect, and local if construction occurs during the winter months. Anticipated impacts during construction would be minor, adverse, short term, indirect, and local if construction occurs during the spring or summer months. The dump trucks that are used to transport the riprap to the barge would have a negligible, adverse, short term, indirect, regional effect on air quality. Once construction is completed, there would be no effects on air quality at the park due to Alternative B. Overall, when effects of other past, present, and future plans, projects, and activities affecting air quality are combined with the effects of actions under Alternative B, cumulative, negligible to minor, adverse, short term, indirect effects would occur. Alternative B would not produce major adverse effects on air quality whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to air quality as a result of the implementation of Alternative B.

## SOILS

### Alternative A (No Action Alternative)

Under this alternative, no action would be taken to repair the seawall. The seawall would continue to deteriorate and would eventually fail, allowing saltwater to enter the grassed area

around the fort and would cause additional soil erosion. Also, the deterioration of the seawall would allow heavy rainstorms to transport soil through the seawall into the Matanzas River. If the seawall fails, it would allow floodwaters or tidal surges into the park and surrounding areas during extreme weather events resulting in additional soil erosion. The implementation of Alternative A would result in a moderate to major adverse, long term, indirect, local effect on soils at the park.

**Cumulative Effects.** The historic seawall at the park would have a moderate, beneficial, long-term, direct, local effect on soils in the area adjacent to the seawall in the park as the seawall reduced erosion on the active side of the seawall. The dredging of the Intercoastal Waterway in the area near the park would have a no effect on soils in the vicinity of the park. The St. Augustine seawall rehabilitation would have no effect on soils at the park, but could help to preserve soils between the Santa Maria Restaurant and the Florida National Guard property by reducing erosion in that area. The new parking garage has no beneficial or adverse, long or short term, direct or indirect, local or regional effect on soils at the park. The projects in the proposed general management plan would increase the amount of undeveloped ground at the park due to reduced parking and relocated ticket booths on the site, and impacts would be negligible, beneficial, long term, direct and indirect, and local. Overall, when effects of other past, present, and future plans, projects, and activities affecting soils are combined with the effects of actions under Alternative A, the cumulative effects would be moderate to major, adverse, long term, indirect, and local.

**Conclusion.** The implementation of Alternative A would result in a moderate to major adverse, long term, indirect, local effect on soils at the park. Overall, when effects of other past, present, and future plans, projects, and activities affecting soils are combined with the effects of actions under Alternative A, the cumulative effects would be moderate to major, adverse, long term, indirect, and local. Alternative A would not produce major adverse effects on soils whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to soils as a result of the implementation of Alternative A.

#### **Alternative B (Preferred Alternative)**

The implementation of Alternative B would result in the stabilization of the seawall and the reduction of soil erosion. In conjunction with the maintenance activity of patching of the seawall cracks, tidal waters and rainwater would no longer penetrate the seawall and erosion would be reduced. The installation of the riprap would support and protect the seawall and slow further deterioration. Implementation of the Preferred Alternative would result in a moderate, beneficial, long-term, direct effect on local soils because it would prevent further erosion.

**Cumulative Effects.** The cumulative effects of other past, present, and future projects affecting soils in the area are the same as those described for Alternative A. Overall, when effects of other past, present, and future plans, projects, and activities affecting soils are combined with the effects of actions under Alternative B, the cumulative effects would be moderate to major, adverse, long term, indirect, and local.

**Conclusion.** Implementation of the Preferred Alternative would result in a moderate, beneficial, long-term, direct effect on local soils because it would prevent further erosion of the backfill soils. Overall, when effects of other past, present, and future plans, projects, and

activities affecting soils are combined with the effects of actions under Alternative B, the cumulative effects would be moderate to major, adverse, long term, indirect, and local. Alternative B would not produce major adverse effects on soils whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to soils as a result of the implementation of Alternative B.

## **WETLANDS**

### **Alternative A (No Action Alternative)**

For this alternative, no seawall stabilization would occur. The small strip of wetland vegetation on the northwestern tip of the construction zone would not be affected by riprap placement and the vegetation would persist. Therefore, Alternative A implementation would result in no effects to wetlands.

#### **Cumulative Effects.**

The park is located in St. Augustine, surrounded by an urban landscape. This landscape has been significantly altered over time with various developments including an increase in impervious space due to buildings, road construction, and other types of infrastructure. Concomitant to this growth pattern typical of this region of Florida is the maintenance of the Intercoastal Waterway and inlets by periodic dredging. The cumulative effect of these past, present and future actions is a trend towards degradation of water quality, loss of wetland habitat, and associated effects on wetland resources. The following is an overview of the cumulative effects.

The original construction of the historic seawall at the park has had a moderate, adverse, long-term, direct, local effect on wetlands in the area near the seawall in the park. The dredging of the Intercoastal Waterway in the area near the park has had a minor, adverse, short-term, indirect, local effect on wetlands in the vicinity of the park. The St. Augustine seawall rehabilitation, the new parking garage, and the proposed general management plan improvements for the park would have no effect on wetlands at the park. Overall, when effects of other past, present, and future plans, projects, and activities affecting wetlands are combined with the effects of actions under Alternative A, cumulative, moderate, adverse, long term, direct, and local effects would occur.

**Conclusion.** Alternative A would have no effect on wetlands. Overall, when effects of other plans, projects, and activities affecting wetlands are combined with these effects of actions under Alternative A, cumulative, moderate, adverse, long term, direct, and local effects would occur. Alternative A would not produce major adverse effects on wetlands whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to wetlands as a result of the implementation of Alternative A.

### **Alternative B (Preferred Alternative)**

During the construction activity, no sediments would be excavated; the machine would only be used to place the riprap. Approximately 200 square feet of smooth cord grass at the northwestern tip of the northern construction zone would be eliminated. Therefore, the



construction activity associated with Alternative B would result in minor, adverse, short term and long term, direct, local effects on wetlands.

**Cumulative Effects.** The cumulative effects of other past, present, and future projects affecting wetlands in the area are the same as those described for Alternative A. Overall, when effects of other past, present, and future plans, projects, and activities affecting wetlands are combined with the effects of actions under Alternative B, cumulative, moderate, adverse, long-term, local effects would occur.

**Conclusion.** The construction of Alternative B would result in minor, adverse, short term and long term, direct, local effects on wetlands. Overall, when effects of other plans, projects, and activities affecting wetlands are combined with these effects of actions under Alternative B, cumulative, moderate, adverse, long-term, direct, local effects would occur. Alternative B would not produce major adverse effects on wetlands whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to wetlands as a result of the implementation of Alternative B.

## AQUATIC RESOURCES

### Alternative A (No Action Alternative)

Under the no-action alternative, the seawall stabilization project would not take place. The Essential Fish Habitat, benthic invertebrate populations, and vegetation in the Matanzas River would continue to be affected by soil erosion from the site. No construction activities would occur in the river under the no action alternative. The effects of the no action alternative on aquatic resources would therefore be limited to continued erosion from the existing, unrepaired seawall. This would constitute a negligible adverse, long term, indirect, local impact on aquatic resources due to the slight increase in turbidity.

### Cumulative Effects.

The park is located in St. Augustine, surrounded by an urban landscape. This landscape has been significantly altered over time with varying developments including an increase in impervious space due to buildings, road construction, and other types of infrastructure. Concomitant to this growth pattern typical of this region of Florida is the maintenance of the Intercoastal Waterway and inlets by periodic dredging. The cumulative effect of these past, present and future conditions is a trend towards degradation of water quality, and associated effects on aquatic resources. The following is an overview of the cumulative effects.

The historic seawall at the park has had a negligible, adverse, long-term, indirect, local effect on aquatic species in the area near the seawall in the park. The dredging of the Intercoastal Waterway in the area near the park would have a minor, adverse, short-term, indirect, local effect on aquatic species in the vicinity of the park. The St. Augustine seawall rehabilitation would have no effect on aquatic resources at the park, but the project could have an indirect adverse affect on aquatic resources in the vicinity of that project, which is located approximately 1,800 feet south of the park on the Matanzas River. The indirect adverse effects would be related to potential stormwater runoff, sedimentation, increased turbidity and water quality effects during construction. The new parking garage has no effect on aquatic resources at the park. While the increased impervious surface would increase stormwater runoff, it is assumed that the

stormwater would be treated prior to discharge into the Matanzas River. The proposed general management plan improvements for the park would have a negligible, beneficial, long term, indirect, local effect on aquatic resources at the park due to the reduced stormwater runoff resulting from the reduced parking area and increase in the amount of pervious surface. Overall, when effects of other past, present, and future plans, projects, and activities affecting aquatic resources are combined with the effects of actions under Alternative A, cumulative, minor, adverse, long term, direct, and local effects would be expected to occur.

**Conclusion.** Alternative A would have a negligible, adverse, long term, indirect, local impact on aquatic resources. Overall, when effects of other plans, projects, and activities affecting aquatic resources are combined with these effects of actions under Alternative A, cumulative, minor, adverse, long term, direct, and local effects would occur. Alternative A would not produce major adverse effects on aquatic resources whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to aquatic resources as a result of the implementation of Alternative A.

#### **Alternative B (Preferred Alternative)**

During the construction activity, some disturbance of benthic invertebrates in the sediments would be expected during the movement of the barges due to the shallow water. Fish and other mobile aquatic species would retreat from the construction site and return when conditions were more favorable. Any benthic invertebrates present in the riprap area would be buried and would not likely survive. However, the construction area does not provide unusual habitat within the Matanzas River for benthic species. Once in place after the construction is completed, the riprap would provide a physically diverse sub-tidal and inter-tidal habitat for small fish, oysters, and other aquatic life.

The relatively small area of sparsely vegetated smooth cord grass at the northern end of the seawall would be eliminated. No other vegetation such as seagrass is present, according to the park staff. A very small area of Essential Fish Habitat would be affected because of the limited extent of effects on salt marsh, bottom sediments and water column. Therefore, the construction activity associated with Alternative B would result in minor, adverse, short term, direct and indirect, local effects on aquatic resources. Once constructed, the riprap material would create a more physically diverse habitat for aquatic invertebrates and juvenile fish on the surface and spaces between the riprap material. Thus, Alternative B would result in a minor, beneficial, long term, indirect, local effect on aquatic resources.

**Cumulative Effects.** The cumulative effects of other past, present, and future projects affecting aquatic resources in the area are the same as those described for Alternative A. Overall, when effects of other past, present, and future plans, projects, and activities affecting aquatic resources are combined with the effects of actions under Alternative B, cumulative, minor, adverse, long-term and short term, local effects would occur.

**Conclusion.** The construction activity associated with Alternative B would result in minor, adverse, short term, direct and indirect, local effects on aquatic resources. Once in place, Alternative B would result in a minor, beneficial, long term, indirect, local effect on aquatic resources. Overall, when effects of other plans, projects, and activities affecting aquatic resources are combined with these effects of actions under Alternative B, cumulative, minor,

adverse, long-term and short term, local effects would occur. Alternative B would not produce major adverse effects on aquatic resources whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to aquatic resources as a result of the implementation of Alternative B.

## **WATER QUALITY**

### **Alternative A (No Action Alternative)**

This alternative involves no construction, thus turbidity in the water would not be increased due to that activity. However, the tidal and wave action that currently results in turbidity due to the erosion of soil on the active side of the seawall would continue. This is a relatively small proportion of erosion when taken into the context of the entire basin. Storm events, including heavy rains that saturate the soil behind the seawall and heavy tidal action would increase the erosion and transportation of soil through the seawall. Water quality effects as a result of the No Action Alternative would be negligible to minor (depending on the durations and levels of storm activity), adverse, long term, indirect, and local.

**Cumulative Effects.** The historic seawall at the park has had a minor, beneficial, long-term, indirect, local effect on water quality in the river near the park due to decreased soil erosion into the river. The dredging of the Intercoastal Waterway in the area near the park would have a minor to moderate, adverse, short-term, indirect, local effect on water quality in the river near the park due to increased turbidity in the water resulting from the dredging activities. The St. Augustine seawall rehabilitation would have minor, adverse, short term, indirect, local effect on water quality at the park during construction and negligible, beneficial, long term, indirect, local effect on water quality at the park after construction. The new parking garage has no beneficial or adverse, long or short term, direct or indirect, local or regional effect on water quality at the park. The increase in impervious surface would increase stormwater runoff volumes, but the stormwater would be treated prior to discharge into the Matanzas River. The proposed general management plan improvements for the park would have a negligible, beneficial, long term, indirect, local effect on water quality at the park due to the reduction in non-permeable surfaces associated with the improvements. Overall, when effects of other past, present, and future plans, projects, and activities affecting water quality are combined with the effects of actions under Alternative A, cumulative, long-term and short term, negligible, local adverse effects would occur.

**Conclusion.** Water quality impacts as a result of the No Action Alternative would be negligible to minor, adverse, long term, indirect, and local. Overall, when effects of other plans, projects, and activities affecting water quality are combined with these effects of actions under Alternative A, cumulative, long-term and short term, negligible, local adverse effects would occur. Alternative A would not produce major adverse effects on water quality whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to water quality as a result of the implementation of Alternative A.

**Alternative B (Preferred Alternative)**

A barge would be used to transport the riprap to the seawall. Movement of the unpowered barge would require a tugboat to operate in the shallow waters near the park. During construction of the seawall riprap protection layer, it would be necessary to stabilize the barge near the seawall and operate an excavator from that location. The barge would use spuds or posts driven into the bay bottom to anchor the barge in place. The operation of the tugboat's propellers in shallow water and the driving of the spuds into the bay bottom would result in a temporary increase in turbidity levels in the construction area. When the riprap is off-loaded into the water, the force of the rocks striking the bay bottom would result in the suspension of some sediment into the water column. In addition, tiny particles of abraded rock and dirt from the riprap could also become suspended in the water column. Each of these activities may increase turbidity levels in the water. However, the use of best management practices would reduce the adverse effects to the Matanzas River and restrict water quality disturbances to within the construction area until the suspended particles have an opportunity to settle into the substrate. After construction, the riprap would reduce the water turbidity levels by reducing the amount of soil that is transferred from the active (landward) side of the seawall to the passive (seaward) side of the seawall. The effects on water quality resulting from the construction of Alternative B would be minor, adverse, short term, indirect, and local. The effects on water quality resulting from the operation of the Preferred Alternative would be negligible, beneficial, long term, indirect, and local.

**Cumulative Effects.** The cumulative effects of other past, present, and future projects affecting water quality in the area are the same as those described for Alternative A. Overall, when effects of other past, present, and future plans, projects, and activities affecting water quality are combined with the effects of actions under Alternative B, cumulative, negligible, adverse, long-term and short term, local effects would occur.

**Conclusion.** The effects on water quality resulting from the construction of the Preferred Alternative would be minor, adverse, short term, indirect, and local. The effects on water quality resulting from the operation of the Preferred Alternative would be negligible, beneficial, long term, indirect, and local. Overall, when effects of other plans, projects, and activities affecting water quality are combined with these effects of actions under Alternative B, cumulative, negligible, adverse, long-term and short term, local effects would occur. Alternative B would not produce major adverse effects on water quality whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to water quality as a result of the implementation of Alternative B.

**SPECIAL STATUS SPECIES****Alternative A (No Action Alternative)****West Indian Manatee**

Alternative A involves no construction activity and no changes to the existing seawall. This alternative would have no effect on the West Indian manatee or its habitat.

**Cumulative Effects.** The historic seawall at the park has had no effect on West Indian manatees in the river near the park. The dredging of the Intercoastal Waterway in the area near the park would have a minor, adverse, short-term, indirect, local effect on West Indian manatees in the

river near the park due to the activity associated with the dredging. The St. Augustine seawall rehabilitation would have negligible to minor, adverse, short term, indirect, local effect on West Indian manatees near the park during construction and no effect on manatees near the park after construction. The new parking garage at St. Augustine and the proposed general management plan improvements for the park would have no effect on manatees near the park. Overall, when effects of other past, present, and future plans, projects, and activities affecting West Indian manatees are combined with the effects of actions under Alternative A, cumulative, negligible, adverse, short term, local effects would occur

**Conclusion.** This alternative would have no effect on the West Indian manatee and its habitat. Overall, when effects of other plans, projects, and activities affecting West Indian manatees are combined with these effects of actions under Alternative A, cumulative, negligible, adverse, short term, local effects would occur. Alternative A would not produce major adverse effects on the West Indian manatee whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to West Indian manatees or manatee habitat as a result of implementation of Alternative A.

### Sea Turtles

Under Alternative A, there would be no construction on the seawall at the park, and no need for the barges. Therefore, the No Action Alternative would have no effect on sea turtles or their habitat.

**Cumulative Effects.** The historic seawall at the park has had no effect on sea turtles in the river near the park. The dredging of the Intercoastal Waterway in the area near the park would have a minor, adverse, short-term, indirect, local effect on sea turtles in the river near the park due to the activity associated with the dredging. The St. Augustine seawall rehabilitation would have negligible to minor, adverse, short term, indirect, local effect on sea turtles near the park during construction and no effect on sea turtles near the park after construction. The new parking garage and the proposed general management plan improvements for the park would have no effect on sea turtles near the park. Overall, when effects of other past, present, and future plans, projects, and activities affecting sea turtles and their habitat are combined with the effects of actions under Alternative A, cumulative, negligible, adverse, short term, local effects would occur.

**Conclusion.** This alternative would have no effect on sea turtles. Overall, when effects of other plans, projects, and activities affecting sea turtles and their habitat are combined with these effects of actions under Alternative A, cumulative, negligible, adverse, short term, local effects would occur. Alternative A would not produce major adverse effects on sea turtles whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to sea turtles or their habitat as a result of the implementation of Alternative A.

## **Alternative B (Preferred Alternative)**

### **West Indian Manatee**

The construction of the Preferred Alternative requires some activity that could potentially harm manatees if they were located in the construction area during the period of construction. The barge and tugboat that would transport the riprap and excavator move very slowly, so any manatees that would happen to be in the vicinity could move away from the barge and avoid a collision. The project area does not support the sea grasses that comprise the majority of the manatee diet, and the boating traffic and recreational activities in the vicinity discourage the use of the area as a manatee breeding area. Therefore, manatees are not frequently found in the vicinity of the proposed seawall stabilization. Furthermore, the water is very shallow near the seawall even during high tide and a manatee could be easily seen and avoided by the excavation operator and crew. As a result, effects to the manatee or its habitat from the riprap placement are unlikely. Therefore, construction of the Preferred Alternative would have a negligible, adverse, short term, local, indirect effect on the West Indian manatee. After construction is completed, the riprap would have no adverse or beneficial, long term, direct or indirect, local or regional effect on the West Indian manatee or its habitat.

**Cumulative Effects.** The cumulative effects of other past, present, and future projects affecting West Indian manatees in the area are the same as those described for Alternative A. Overall, when effects of other past, present, and future plans, projects, and activities affecting the West Indian manatee and their habitat are combined with the effects of actions under Alternative B, cumulative, negligible, adverse, short term, local effects would occur.

**Conclusion.** Construction of the Preferred Alternative would have negligible, adverse, short term, local, indirect effect on the West Indian manatee. After construction is completed, the riprap would have no effect on the manatee. Overall, when effects of other plans, projects, and activities affecting the West Indian manatee and their habitat are combined with these effects of actions under Alternative B, cumulative, negligible, adverse, short term, local effects would occur. Alternative B would not produce major adverse effects on the West Indian manatee whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to West Indian manatees or their habitat as a result of the implementation of Alternative B.

### **Sea Turtles**

Under Alternative B, there is a remote potential for sea turtles to collide with the barge required for the transport of the riprap during the construction timeframe. Barges are relatively slow-moving vessels and although sea turtles are relatively slow swimmers, the likelihood of a collision is very remote. Sea turtles are not likely to enter or linger in the shallow waters around the construction area due to the lack of foraging habitat or nesting areas in the vicinity of the park. Therefore, the Preferred Alternative would have a negligible, adverse, short term, indirect, local effect on sea turtles known to occur in the area. After construction is completed, the riprap would have no effect on sea turtles and their habitat.

**Cumulative Effects.** The cumulative effects of other past, present, and future projects affecting sea turtles in the area are the same as those described for Alternative A. Overall, when effects of other past, present, and future plans, projects, and activities affecting sea turtles and their habitat

are combined with the effects of actions under Alternative B, cumulative, negligible, adverse, short term, local effects would occur.

**Conclusion.** Construction of Alternative B would have a negligible, adverse, short term, indirect, local effect on sea turtles known to occur in the area. After construction is completed, the riprap would have no effect on sea turtles. Overall, when effects of other plans, projects, and activities affecting sea turtles and their habitat are combined with these effects of actions under Alternative B, cumulative, negligible, adverse, short term, local effects would occur. Alternative B would not produce major adverse effects on the sea turtles whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to sea turtles or their habitat as a result of the implementation of Alternative B.

## CULTURAL RESOURCES

### Alternative A (No Action Alternative)

#### Historic Structures

The historic 19<sup>th</sup> century seawall at the Castillo de San Marcos National Monument that serves to protect the fort is failing. During incoming tides, the sea water filters through cracks in the wall and then drains back out through and beneath the wall during outgoing tides. This continuing process has displaced soils from behind the wall, scoured the nearby landscape, widened cracks in the wall, and eroded the tabby cement that bonds the coquina blocks together. The base or toe of the southern portion of wall has been displaced outward. Although the northern portion of the wall does not show the same amount of displacement, it also is suffering from loss of mortar, erosion and cracking. Storm surges and other severe weather events continue to exacerbate these problems.

Even with on-going maintenance, monitoring, and use of stop-gap measures, the seawall faces an almost certain threat of deterioration and future failure. In addition, because the wall provides protection for the structures and the landscape of Castillo de San Marcos, its failure would pose a serious threat to the integrity of the oldest masonry fortification in the continental United States. Continuation of existing conditions would have a moderate adverse, long-term, direct and indirect effect on the park's historic structures, and to historic features of St. Augustine.

**Cumulative Effects.** The area considered for cumulative effects on historic structures under Alternative A includes the area within Castillo de San Marcos National Monument and the seawall area of St. Augustine. The time period begins during the middle of the 19th century with demolition of the original seawall and construction of the existing wall, and includes both the present and foreseeable future during which the wind, tides, natural processes, and human activities have, or would have, added to, modified, or destroyed cultural sites and structures within the park.

Prior to creation of the park, the entire area had undergone numerous changes, both at the fort and at St. Augustine as it grew from a small collection of buildings to a city, with all the accompanying modifications to historic structures. Demolition of the original historic seawall and construction of the present wall was an early part of the cumulative impacts on the historic structures at Castillo de San Marcos.

Natural processes such as hurricanes, high tides, insects, and humidity also continue to contribute to the deterioration of the area's historic structures. Cumulative impacts to the seawall from natural processes began shortly after its construction, and have continued through the century and a half of its life. Such changes are likely to continue into the future as the area continues to grow and as future natural events take their toll on these resources.

Acquisition of Castillo de San Marcos by the National Park Service helped ensure future protection of cultural resources within the park, a long term, moderate benefit. The original construction of the historic seawall at the park had, and continues to have, moderate to major, beneficial, long-term, direct and indirect, local effects on historic structures at the park. The continued dredging of the Intercoastal Waterway in the area near the park would have no effect on historic structures at the park. The St. Augustine seawall rehabilitation would not affect historic structures at the park, but would have both adverse and beneficial effects on historic structures to the south of the park. Benefits would accrue from the new city seawall by helping to protect historic structures from storm events. Adverse effects would occur as the historic seawall would be covered with soil and hidden from view. There would be no effect on the historic seawall at the park as a result of implementing the city seawall project. The new parking garage would have no effect on historic structures at the park.

The projects proposed as part of the park's general management plan would have a future minor, beneficial, long term, local, direct effect on historic structures at the park. As an example, benefits would result from removal of non-historic administrative uses from three casemates in the fort so these structures could be used for visitor education and interpretation. These actions would restore the casemates to a more historic appearance/context as well as improving visitor appreciation for the structures.

It is likely that time and natural processes would claim some of the area's historic structures in the future. Some of the ongoing and future park projects would help slow the negative trend of site deterioration and loss of information, but under continuation of current conditions described in Alternative A, it is likely that some parts of the historic seawall at Castillo de San Marcos could be lost to hurricanes and deterioration, which could result in damage to or loss of some of the area's other historic structures within the park. Overall, when effects of other past, present, and future plans, projects, and activities affecting historic structures are combined with the effects of actions under Alternative A, cumulative, moderate, adverse, long term, direct and indirect, local effects to the historic seawall and the park's other structures would result.

**Conclusion.** Continuation of existing conditions as described for Alternative A would have a long-term, local, moderate, adverse effect, both direct and indirect, on the park's historic structures, and to historic features of St. Augustine. Cumulative effects would be moderate, adverse, long term, direct and indirect and local, resulting from past and future natural processes and from human activities such as demolition of the original seawall and construction and maintenance of the present wall, as well as proposed development of a new city seawall. Alternative A would not produce major adverse effects on historic structures whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to historic structures as a result of the implementation of Alternative A.



## Cultural Landscape

Despite the fact that the designed landscape at Castillo de San Marcos has not been formally inventoried or designated as a cultural landscape, it is apparent that the seawall is a vital and integral part of the historic landscape of both the fort and the adjacent city of St. Augustine. The seawall protects the area's landward features, including various Spanish-style structures whose evolutionary design and landscape setting of vegetation, walks, and access corridors aptly reflect the long history of the site. The seawall borders the Matanzas River and defines the visual boundaries of the fortress, both as viewed from the land and from the sea. The native stone used in the wall also calls to mind the historic nature of the site, and the human energy and suffering that went into its construction. The seawall contributes to the historic appearance and significance of the landscape. Continuation of current conditions under Alternative A would eventually result in loss of part or all of the seawall and severe damage to the adjacent landscape and structures. Such loss or damage to these landscape elements would have moderate, adverse, long term, direct and indirect, local effects.

**Cumulative Effects.** The area and the time period considered for cumulative effects on the cultural landscape would be the same as described under "Historic Structures" above. Construction of the present seawall at Castillo de San Marcos to replace the earlier wall added a new element to the fort landscape during the mid-1800s. The new wall differed slightly in design, thus contributing to the adverse cumulative effects on the cultural landscape. However, because cultural landscape features are recognizably dynamic and prone to change over time, the present seawall also reflects this period of historic growth and change in the area.

Adverse cumulative effects on the cultural landscape from human actions and natural processes would be similar to those described for historic structures as well. While construction of the new seawall would benefit the historic scene in the area by reducing storm effects on inland structures and vegetation, the new wall along the city property would contribute a new, non-historic element to the cultural landscape. Construction of a new seawall by the city would help protect structures in that area to the south of the park, but this project would have no effect on the park cultural landscape. The new parking garage would have a negligible to minor, adverse, long term, indirect, local effect on the cultural landscape, as it can be seen from most viewpoints at the park. The adverse effects of the parking garage would be reduced to negligible to minor as the garage is constructed in an architectural style that is compatible with the St. Augustine historic district. The projects proposed as part of the park's general management plan would have a minor, beneficial, long term, direct, local effect on the cultural landscape at the park. That is, converting a portion of the existing visitor parking lot to grass would help restore historic feeling to this area, and relocation of the ticket booth and sales function away from the park would remove intrusive modern structures from the historic scene. Overall, when the effects of other past, present, and future plans, projects, and activities affecting cultural resources are combined with the effects of actions under Alternative A, cumulative, moderate, adverse, long-term, direct and indirect, local effects would occur.

**Conclusion.** Continuation of existing conditions as described for Alternative A would have a long-term moderate adverse effect, both direct and indirect, on the cultural landscape. Cumulative effects would be moderate, adverse, long-term, direct and indirect, and local, resulting from past and future natural processes and from human activities such as demolition of the original seawall and construction and maintenance of the present wall, as well as proposed development of a new city seawall. Alternative A would not produce major adverse effects on the cultural landscape whose conservation is (1) necessary to fulfill specific purposes identified

in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to the cultural landscape as a result of the implementation of Alternative A.

### **Alternative B (Preferred Alternative)**

#### **Historic Structures**

Historic documents describing construction at the fortress note that riprap was to be placed to protect some of its features, such as the water battery. Thus, there is historic precedent for use of riprap at the park as a protective measure. Placement of riprap along the seaward side of the seawall would serve to slow the erosive force of wave action and would help to support the base of the wall.

As part of routine maintenance activities, cracks in the seawall would be filled with a hydraulic lime mortar to prevent water from passing through. Repairs to the mortar would reduce the soil erosion on the active (landward) side of the seawall, and reduce pressure on the wall during storm events. Work completed under Alternative B would meet the Secretary of the Interior's Standards for rehabilitation. That is, the wall would continue to be used as it was historically, its historic character would be retained and preserved, the deteriorated mortar would be repaired, and any replacement mortar or stone would match the original in materials, design, composition, color, and texture. Placement of the riprap and repairs to the wall would have a moderate, beneficial, long-term, direct and indirect, local effect on the integrity of the wall. Preservation of the wall would, in turn, contribute to preservation of the historic structures within the park.

**Cumulative Effects.** The cumulative effects of other past, present, and future projects affecting historic structures at the park are the same as those described for Alternative A. Overall, when effects of other past, present, and future plans, projects, and activities affecting cultural resources are combined with the beneficial effects of actions under Alternative B, cumulative, moderate, beneficial, long-term, direct and indirect, local effects would occur to historic structures at the park.

**Conclusion.** Placement of the riprap and repairs to the wall would have a moderate, beneficial, long-term, direct and indirect, local effect on the integrity of the wall. Preservation of the wall would, in turn, contribute to preservation of the historic structures within the park. Overall, when effects of other past, present, and future plans, projects, and activities affecting cultural resources are combined with the beneficial effects of actions under Alternative B, cumulative, moderate, beneficial, long-term, direct and indirect, local effects would occur to historic structures at the park. Alternative B would not produce major adverse effects on historic structures whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to historic structures as a result of the implementation of Alternative B.

## Cultural Landscape

One of the major concerns in attempting to stabilize and protect the seawall has been to prevent introduction of intrusive modern materials or structures into the historic landscape. In the past, pieces of coquina and other stone materials have fallen, have been washed, have been dropped, or were discarded along the seaward side of the wall. These materials are visible in some areas along the wall. The riprap would be visible primarily at low tide. In addition, the eventual growth of algae would soften the appearance of the stones. Short-term visual effects of implementation of Alternative B would be adverse, minor, direct, and local. Long-term visual effects would be negligible, adverse, direct, and local. Long-term direct effects on other landscape elements – such as the wall itself, the walkways, structures, and grass vegetation behind the seawall—would be moderate, beneficial, indirect, and local.

**Cumulative Effects.** The cumulative effects of other past, present, and future projects affecting the cultural landscape are the same as those described for Alternative A. Overall, when effects of other past, present, and future plans, projects, and activities affecting the cultural landscape are combined with the effects of actions under Alternative B, cumulative, long-term, minor, adverse, indirect, local effects on the cultural landscape would occur.

**Conclusion.** Short-term visual effects of implementation of Alternative B would be adverse, minor, direct, and local. Long-term visual effects would be negligible, adverse, direct, and local. Long-term direct effects on other landscape elements – such as the wall itself, the walkways, structures, and grass vegetation behind the seawall—would be moderate, beneficial, indirect, and local. Overall, when past, present, and future effects of other plans, projects, and activities affecting cultural resources are combined with these effects of actions under Alternative B, there would be a cumulative, minor, adverse, long-term, indirect, local effect. Alternative B would not produce major adverse effects on the cultural landscape whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to cultural landscape values as a result of implementation of Alternative B.

## SECTION 106 SUMMARY

This environmental assessment has defined the area of potential effect (primarily the park), described existing cultural resource conditions (including National Register properties) in the study area, and evaluated the potential environmental impacts of two alternatives: Alternative A, a continuation of existing conditions and Alternative B, the Preferred Alternative. Definitions of intensity levels for cultural resources were developed to provide a basis for evaluating impacts of proposed actions on cultural resources. Best management practices were developed to help ensure the protection and preservation of cultural resources eligible for or listed on the National Register (see Table 5) in the Mitigation section below).

The Castillo de San Marcos seawall is part of a larger seawall system that protects the park as well as the city of St. Augustine, Florida. Most of the 1,350-foot-long segment of historic coquina stone and tabby seawall within the park is in fair condition, but two sections are failing. The southernmost 243 feet of the seawall and 70 feet of the seawall near the northeast corner of the fort contain large cracks that allow water to penetrate the wall and erode the soil on the landward (active) side of the seawall. In recent years, this erosion resulted in the sinking of the sidewalk that lies adjacent to the southern section of the seawall. Various engineering solutions

were analyzed, but most were rejected because of potential effects to subsurface archeological resources or to the historic landscape (see the Alternatives section for more details). The proposed action would place riprap at the base of the seawall on the seaward side. The riprap would extend outward for about 10 feet before sloping downward to grade. (Details of the design are provided in the Engineering Report in Appendix A). Historic documents note that riprap originally was planned to help protect some areas of the fortress, so there is a precedent for its use.

**Archeological Resources.** The proposed action would not disturb any archeological resources that may lie buried on the landward side of the seawall (*no historic properties affected*). Any artifacts or features that may remain on the outside of the wall have, for several centuries, been affected by storms, wave action, tides, boats, and past construction activities. Thus, few if any *in situ* archeological resources would be expected on the seaward side of the wall (*no adverse effect*).

**Historic Structures.** The seawall itself has had a long history of periods of care interspersed with times of neglect and damage from storms and human activities. Since coming into the National Park Service system, the fort and the seawall have been subject to routine maintenance and monitoring. However, the effects of time, weather and deterioration have outpaced the ability of routine maintenance to stabilize the historic seawall.

Addition of the riprap would help protect the seawall by slowing and reducing the effects of wave action. Deteriorated or missing mortar in the seawall would be repaired or replaced, and this work would follow the Secretary of the Interior's Standards. Wherever replacement stone or mortar would be needed, it would match the original in materials, design, composition, color, and texture. The seawall could continue to be used as it was historically, and the historic character would be retained and preserved (*no adverse effect*).

**Cultural Landscape.** Although the designed landscape at Castillo de San Marcos has not been formally designated as a cultural landscape through completion of inventory and preparation of a Cultural Landscape Report, the visual qualities of the historic scene include character-defining features such as landforms and landscape elements, water features such as Matanzas Bay, vegetation, viewsheds, access routes, the seawall, and numerous Spanish-style structures.

Placement of the riprap would introduce a new element into this landscape because the riprap would be visible at low tide. However, at present, some broken bits of coquina and other stones lie scattered on the ocean floor near the wall. In addition, any adverse effects would be short-term because, in time, erosion and algae and other organisms would help soften the sharp contours of the stone. Thus, the introduction of the riprap would have a visual effect on the landscape, but this effect would not be adverse (*no adverse effect*).

In addition, rehabilitation of the seawall would result in long-term protection (a benefit) for the overall historic landscape, including the seawall itself, the landforms, buildings, vegetation, and access routes, both at the fort and the city of St. Augustine. Thus implementation of Alternative B would have an effect on the historic landscape, but this effect would not be adverse (*no adverse effect*).

This environmental assessment will be used as a vehicle to accomplish Section 106 compliance for this project. The Advisory Council on Historic Preservation, the Florida state historic preservation officer, and concerned tribes were contacted at the beginning of this environmental assessment process (see Consultation and Coordination and letters in Appendix

B). This environmental assessment also will be available for these entities for their review and comment.

In the unlikely event that cultural resources are discovered during project implementation treatment, work would be halted in the vicinity of the resource, and procedures outlined in 36 CFR 800 would be followed.

After applying the implementing regulations of the Advisory Council on Historic Preservation (36 CFR 800, revised regulations effective January 2001), addressing the criteria of effect and adverse effect, the National Park Service finds that the implementation of the Preferred Alternative, Alternative B, would result in a finding of *no adverse effect* to historic properties.

## MITIGATION

Table 5 identifies best management practices which are recommended for minimizing effects on cultural resources.

**Table 5. Mitigation for Cultural Resources**

All rehabilitation of historic features in the seawall would be conducted in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties and in consultation with the Florida state historic preservation office.
Work would be documented photographically and in written text and these records would be retained by the park as part of their archival collections.
If prehistoric or historic archeological resources are discovered during any portion of the project, an archeologist meeting the Secretary of the Interior's Standards would help ensure that procedures outlined in 36 CFR 800 would be followed, potentially including relocation of the work to a non-sensitive area to avoid further disturbance to the site until the significance of the find can be evaluated.
Discovered resources would be evaluated for their potential National Register of Historic Places significance, and, if needed, mitigation measures would be developed in consultation with the Florida State Historic Preservation Officer and appropriate representatives of affected tribes.
Mitigation measures would be cognizant of resource significance and preservation needs, and could include such provisions as changes in project design and/or archeological monitoring of the project and data recovery conducted by an archeologist meeting the Secretary of the Interior's standards.
Construction personnel would be educated about the need to protect any cultural resources encountered.
Work crews would be instructed of the illegality of collecting artifacts on federal lands (Archeological Resources Protection Act).

## VISITOR USE AND EXPERIENCE / VIEWSHED

### Alternative A (No Action Alternative)

This alternative involves no construction and there would be no riprap placed against the seawall to provide support for the wall. The entire historic seawall could be viewed by the visitor as it has stood for the past two centuries. However, as time passes and the seawall continues to deteriorate due to natural forces, the seawall would no longer have the appearance as when it

was constructed. The soil on the active side of the seawall would continue to erode and the seawall would continue to crack until it finally toppled over. Therefore, the appearance of the area would not be expected to be as valued as current conditions allow, and appreciation of the resource would be expected to degrade over time as well. There would be negligible adverse, direct, local effects on visitor use and experience in the short term. However, in the long term, Alternative A would result in moderate, adverse, direct, local effects on visitor use and experience and the viewshed.

**Cumulative Effects.** The historic seawall at the park would have a minor, beneficial, long-term, indirect, local effect on visitor experience and viewshed at the park due to increased safety from reduced erosion and the opportunity to view an historic property. The dredging of the Intercoastal Waterway in the area near the park would have a negligible, adverse, short-term, indirect, local effect on visitor experience and viewshed near the park due to the activity associated with the dredging that is counter to the types of experience anticipated at the park. The St. Augustine seawall rehabilitation would have a moderate, adverse, short term and long term, direct, local effect on visitor use and experience and viewshed in the area south of the park. Visitors that enjoy the view and the walk along the promenade may not be adversely affected, but visitors that enjoy the history of St. Augustine may be adversely affected as the historic seawall would be covered with soil and no longer visible. The new parking garage has a moderate, beneficial, long term, indirect, local effect on visitor use and experience as it provides convenient parking for visitors and a negligible to minor, adverse, long term, direct, local effect on viewshed, as it can be seen from most viewpoints at the park, but is constructed in an architectural style that is compatible with the St. Augustine historic district. The proposed general management plan improvements for the park would have a moderate, beneficial, long term, direct, local effect on visitor use and experience and viewshed. Overall, when effects of other past, present, and future plans, projects, and activities affecting visitor use and experience and viewshed are combined with the effects of actions under Alternative A, cumulative effects on visitor use and experience and the viewshed would be moderate, adverse, direct, and local.

**Conclusion.** There would be negligible beneficial or adverse, direct or indirect, local or regional effects on visitor use and experience in the short term. However, in the long term, Alternative A would result in moderate, adverse, direct, local effects on visitor use and experience and viewshed. Overall, when effects of other plans, projects, and activities affecting visitor use and experience and viewshed are combined with these effects of actions under Alternative A, cumulative effects on visitor use and experience and the viewshed would be moderate, adverse, direct, and local.

### **Alternative B (Preferred Alternative)**

This alternative involves the placement of riprap against the passive (seaward) side of the historic seawall to provide support for the wall. Construction would include a large barge with an excavator which would be located just offshore from the park. The barge would be located adjacent to the seawall in the southern portion of the park for most of the 60 to 90 day construction period, but would also be located by the seawall near the northeast corner of the fort for a short period of time. An excavator with a several hundred horsepower diesel engine would be located on the barge and the engine would be running during most of the time that the fort was open to visitors during weekdays. After construction would be completed, the visitor would notice the riprap placed along the southern and central sections of the seawall, approximately halfway up the wall. The riprap would be composed of rock and chunks of cement. Visitors that stand along the historic seawall and gaze to the east overlooking Matanzas

Bay would be able to see the riprap. Fishermen that currently fish the flats adjacent to the park may find that the riprap provides new habitat for oysters, algae, and small fish that may attract additional game fish into the area. Alternative B would result in moderate, adverse, short term, direct, local effects on visitor use and experience and moderate, adverse, short term, direct, local effects to the viewshed during the construction period. Alternative B would result in minor, beneficial, long term, indirect, local effects on visitor use and experience and negligible to minor, adverse, long term, direct, local effects to viewshed after construction is completed.

**Cumulative Effects.** The cumulative effects of other past, present, and future projects affecting visitor use and experience and viewshed are the same as those described for Alternative A. Overall, when effects of other past, present, and future plans, projects, and activities affecting visitor use and experience and viewshed are combined with the effects of actions under Alternative B, Alternative B would result in moderate, adverse, short term, direct, local effects on visitor use and experience and viewshed; minor, beneficial, long term, indirect, local effects on visitor use and experience; and negligible to minor, adverse, long term, direct, local effects to viewshed.

**Conclusion.** Alternative B would result in moderate, adverse, short term, direct, local effects on visitor use and experience and moderate, adverse, short term, direct, local effects to the viewshed during the construction period. Alternative B would result in minor, beneficial, long term, indirect, local effects on visitor use and experience and negligible to minor, adverse, long term, direct, local effects to viewshed after construction is completed. Overall, when effects of other past, present, and future plans, projects, and activities affecting visitor use and experience and viewshed are combined with the effects of actions under Alternative B, Alternative B would result in moderate, adverse, short term, direct, local effects on visitor use and experience and viewshed; minor, beneficial, long term, indirect, local effects on visitor use and experience; and negligible to minor, adverse, long term, direct, local effects to viewshed.

## **SOUNDSCAPE / NOISE**

### **Alternative A (No Action Alternative)**

Under this alternative, no action would be taken to repair the seawall. The No Action Alternative would result in no effects to the soundscape near the park.

**Cumulative Effects.** The historic seawall at the park would have no effect on the soundscape near the park. The dredging of the Intercoastal Waterway in the area near the park would have a negligible, adverse, short-term, indirect, local effect on the soundscape near the park due to the noise associated with the dredging activity. The St. Augustine seawall rehabilitation would have a minor, adverse, short term, direct, local effect on the soundscape in the area to the south of the park due to construction activity and no effect on the soundscape in the local area after construction is completed. The new parking garage would have negligible, adverse, long term, indirect, local effects on the soundscape due to the additional traffic accessing the site. The projects proposed in the general management plan would beneficially affect the soundscape at the park due to reduced parking on the site. Cumulative impacts to the soundscape would be negligible, beneficial, long term, indirect, and local. Overall, when effects of other past, present, and future plans, projects, and activities affecting the soundscape are combined with the effects of actions under Alternative A, cumulative, negligible, adverse, long-term, local effects would occur.

**Conclusion.** The No Action Alternative would result in no effects to the soundscape or noise near the park. Overall, when effects of other plans, projects, and activities affecting the

soundscape are combined with these effects of actions under Alternative A, cumulative, negligible, adverse, long-term, local effects would occur. Alternative A would not produce major adverse effects on the soundscape or noise whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to the soundscape as a result of the implementation of Alternative A.

### **Alternative B (Preferred Alternative)**

The Preferred Alternative would involve placing riprap on the passive (seaward) side of two sections of seawall at the park. Approximately 961 cubic yards of riprap would be purchased locally and transported by dump truck to a port (possibly Vilano Beach Boat Basin, located on the Matanzas River approximately 2 miles northeast of the park) where the riprap would be transferred to a barge. It is estimated that approximately 39 dump truck loads would be required to transfer the riprap to the barge over a period of 60 to 90 days. The barge would be loaded with approximately 74 cubic yards of riprap and a diesel powered tugboat would transport the barge from the boat basin to the park. This would require approximately 13 round trip barge trips over the 60 to 90 day construction period. The barge would be held in place using spuds (sharp pointed vertical posts used to anchor the barge in place), so no engines would be running to keep the barge stationary during the excavation process. An excavator would move the rock from the barge to the seawall. The excavator is powered by a diesel engine with several hundred horsepower. The excavator would be running nearly all of the time during working hours on weekdays at the job site to place the rocks. There would also be noise associated with placement of the riprap as the rocks are dropped into the proper place. This exhaust noise and noise from the placement of the riprap would last only as long as construction activities occurred. The noise effects experienced at the park would be partially dependent on the wind direction. As the engines that operate the excavation equipment would be located on a barge that would primarily be located to the southeast of the fort where visitors spend most of their time at the park, the noise from the excavation equipment would have a greater adverse affect on visitors at the park when winds are from the southeast. Prevailing wind information from 1961 to 1990 indicated that the months from March to August were most likely to have winds from the southeast (United States Department of Agriculture, 2006). The winter months, particularly November through February, were most likely to have winds from the northwest that would carry the noise from the excavation equipment away from the fort. Therefore, anticipated effects to the soundscape during construction would be minor, adverse, short term, indirect, and local during the spring and summer months and negligible to minor, adverse, short term, indirect, and local during the winter months. There would be no beneficial or adverse, long term, direct or indirect, local or regional impacts associated with operation of Alternative B after construction is completed.

**Cumulative Effects.** The cumulative effects of other past, present, and future projects affecting soundscape are the same as those described for Alternative A. Overall, when effects of other past, present, and future plans, projects, and activities affecting soundscape are combined with the effects of actions under Alternative B, cumulative effects to the soundscape would be minor, adverse, short term, indirect, and local during the spring and summer months and negligible to minor, adverse, short term, indirect, and local during the winter months. The long term cumulative effects would be negligible, adverse, indirect, local effects.



**Conclusion.** Alternative B would result in minor, adverse, short term, indirect, and local effects during the spring and summer months and negligible to minor, adverse, short term, indirect, and local effects during the winter months. There would be no effects associated with operation of Alternative B after construction is completed. Overall, when effects of other past, present, and future plans, projects, and activities affecting soundscape are combined with the effects of actions under Alternative B, cumulative effects to the soundscape would be minor, adverse, short term, indirect, and local during the spring and summer months and negligible to minor, adverse, short term, indirect, and local during the winter months. The long term cumulative effects would be negligible, adverse, indirect, local effects. Alternative B would not produce major adverse effects on the soundscape whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park resources or values related to the soundscape as a result of the implementation of Alternative B.

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## CHAPTER 5 CONSULTATION AND COORDINATION

### INTERNAL AND EXTERNAL SCOPING

Scoping is the effort to involve agencies and the public in determining the scope of issues to be addressed in this environmental assessment. Among other tasks, scoping determines important issues and eliminates issues that are not important; identifies related projects and associated documents; identifies other permits, surveys, and consultations required by other agencies; and creates a schedule which allows adequate time to prepare and distribute the environmental document for public review and comment before a final decision is made. Scoping includes correspondence with any interested agencies or any agencies with jurisdiction by law or expertise (including the Advisory Council on Historic Preservation, the State Historic Preservation Officer, and Indian tribes) to provide early input.

The National Park Service conducted both internal scoping with appropriate National Park Service staff members, and external scoping with the public and affected groups, as well as federal, state and local agencies. Internal scoping meetings were held at the park headquarters on July 13, 2006. A newsletter introducing the project and the project alternatives was distributed in August 2006 to all local and county agencies on the mailing list as well as members of the public that were on the park's mailing list. The newsletter also invited comment on the project alternatives. The newsletter is included in Appendix A.

Eight individuals responded to the alternatives described in the newsletter, with half of the respondents supporting the riprap alternative and half supporting the alternative that proposed a second seawall to the east of the historic seawall. This alternative was later dropped from further consideration due to anticipated significant adverse impacts to the historic seawall. The letters from the public are included in Appendix A.

In addition, scoping letters were mailed to the following agencies (a copy of the scoping letter is included in Appendix A):

- Advisory Council on Historic Preservation
- Florida State Historic Preservation Office, Division of Historical Resources
- National Marine Fisheries Service
- National Oceanic and Atmospheric Administration
- Florida Fish and Wildlife Conservation Commission
- St. Johns Water Management District
- Florida State Clearinghouse, Environmental Protection Agency
- U.S. Army Corp of Engineers
- Federal Emergency Management Agency
- U.S. Coast Guard

- Northeast Florida Regional Planning Council
- Alabama-Coushatta Tribes of Texas
- Alabama-Quassarte Tribal Town
- Apache Tribe of Oklahoma
- Arapaho Business Committee
- Caddo Nation of Oklahoma
- Cheyenne-Arapaho Tribes of Oklahoma
- Chickasaw Nation
- Comanche Nation
- Coushatta Indian Tribe
- Fort Sill Apache Tribe of Oklahoma
- Jicarilla Apache Nation
- Kialegee Tribal Town
- Kiowa Indian Tribe of Oklahoma
- Mescalero Apache Tribe
- Miccosukee Indian Tribe
- Muscogee (Creek) Nation
- North Cheyenne Tribal Council
- Poarch Band of Creek Indians
- San Carlos Tribal Council
- Seminole Nation of Oklahoma
- Seminole Indian Tribe
- Thlopthlocco Tribal Town
- Tonto Apache Tribal Council
- White Mountain Apache Tribal Council
- Yavapai-Apache Community Council

#### **AGENCY COORDINATION**

The Army Corp of Engineers responded to the scoping letter stating that the rehabilitation of the seawall should carefully consider any potential impacts to the historic seawall and the contiguous aquatic resources. The letter stated that a Department of the Army permit would be required if the project affects navigable waters, or dredge or fill is discharged into waters of the United States. *(Note - waters of the United States in this instance would be waters which are used for interstate or foreign commerce*

*including waters which are subject to the ebb and flow of the tide, which would include the project area).*

The Florida Department of Environmental Protection, acting as the Florida State Clearinghouse, also responded to the scoping letter. Their letter indicated that both the St. Johns River Water Management District and the Florida Department of Environmental Protection stated that the proposed project would require an Environmental Resource Permit from the St. Johns River Water Management District. This letter also indicated that the proposed action was consistent with the Florida Coastal Management Program, subject to additional coordination with the agencies during the permitting process. Final concurrence with the Florida Coastal Management Program would be determined during the permitting process.

The Florida Department of State, Division of Historical Resources (State Historic Preservation Office), responded to the scoping letter. Their letter stated that a staff person visited the site during the past year and indicated that some action is required to prevent further deterioration and collapse of the seawall. Their letter stated that the No Action Alternative would have an eventual adverse affect on the historic integrity of the seawall and possibly other features of the park. The installation of riprap was stated to be the most appropriate alternative proposed, but also recommended repair/restoration of the historic seawall, as well. Their letter indicated that the construction of a second seawall to the east of the historic seawall and filling the void between the walls with soil was determined to have significant adverse effects and was strongly discouraged by the State Historic Preservation Office. As a result of this determination, this alternative was dropped from further consideration.

The Comanche Nation responded to the scoping letter, and stated that they had no immediate concerns or issues regarding the seawall rehabilitation project, but asked to receive a copy of the environmental assessment. If any archaeological items or human remains are found during project construction, they stated that work on the project should stop and the Comanche and other Tribal Nations should be contacted.

The following agencies and tribes responded to the scoping letter, but had no comment at this time:

- The Advisory Council on Historic Preservation

- The Northeast Florida Regional Planning Council (through the State Clearinghouse)

- The Florida Fish and Wildlife Conservation Commission (through the State Clearinghouse)

- The Florida Department of State (through the State Clearinghouse)

- Caddo Nation of Oklahoma

- Jicarilla Apache Nation

## PERMITTING

Section 404 of the Clean Water Act establishes a requirement to obtain authorization or a permit for any activity that involves any discharge of dredged or fill material into “Waters of the United States.” Waters of the United States include navigable waters of the United States, interstate waters, all other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or tributaries. Pursuant to Section 404 of the Clean Water Act, the United States Army Corps of Engineers regulates and issues authorization or permits for such activities. Activities that require such authorization or a permit include placing fill or riprap, grading, mechanized land clearing, dredging, excavation, and leveling. Any activity that results in the deposit of dredge or fill material within the “Ordinary High Water Mark” of waters of the United States usually requires a permit, even if the area is dry at the time the activity takes place.

Under Section 10 of the River and Harbors Act of 1899, the construction of structures in, over, or under, excavation material from, or deposition of material into “navigable waters” are regulated by the United States Army Corps of Engineers. Navigable waters of the United States are defined as those waters subject to the ebb and flow of the tide shoreward to the mean high water mark or those that are currently used, have been used in the past, or may be susceptible to use to transport interstate or foreign commerce. A letter of permission or permit is required from the Corps of Engineers prior to any work begin completed within a navigable water.

Alternative B would require that fill be placed in “Waters of the United States” and a wetland resource permit would be required from the U.S. Army. However, in Florida, the U.S. Army Corps of Engineers has delegated the wetland resource permitting to the state agencies – the five regional water management districts and the Florida Department of Environmental Protection. A joint environmental resource permit would address the regulatory concerns of the U.S. Army Corps of Engineers as well as the state environmental agency and the regional water management district.

Initial coordination between the National Park Service and the Florida Department of Environmental Protection indicated that the placement of riprap would require a Noticed General Environmental Resource Permit. However, subsequent coordination determined that the length of the seawall exceeds that allowed for a *Noticed* General Environmental Resource Permit and that a *Standard* General Environmental Resource Permit will be required. Final determination of the permit requirements would be made during the permitting process. They also indicated that the project is consistent with the Florida Coastal Management Program, but final determination would be made during the permitting process.

Permitting for this project would occur after either Alternative A or Alternative B is selected as the proposed action and a Finding of No Significant Impact is issued. If Alternative B is selected as the proposed action, final engineering design plans would be prepared which must accompany the permit application. A site survey would also be performed to determine a more precise inventory of environmental and physical conditions in the project area and a wetland delineation would be performed to precisely identify and quantify the area of wetlands affected.

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