

# DRAFT INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT

ST. FRANCIS BARRACKS SEAWALL SHORELINE  
EROSION PROTECTION STUDY CONTINUING  
AUTHORITIES PROGRAM (CAP) SECTION 14



July 2019



**US Army Corps  
of Engineers** ®  
Jacksonville District

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**US Army Corps of Engineers  
JACKSONVILLE DISTRICT**

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## **PROPOSED FINDING OF NO SIGNIFICANT IMPACT**

### **INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT (IFR/EA) FOR ST. FRANCIS BARRACKS SEAWALL SHORELINE EROSION PROTECTION STUDY**

The U.S. Army Corps of Engineers, Jacksonville District (USACE) has prepared an environmental assessment (EA) in accordance with the National Environmental Policy Act of 1969, as amended (NEPA). USACE assessed the effects of the following actions in the project's integrated feasibility report and environmental assessment (IFR/EA), dated June 2019, for the St. Francis Barracks Seawall Shoreline Erosion Protection Study under Section 14 of the Continuing Authorities Program (CAP).

Implementation of the Recommended Plan will address shoreline erosion at the St. Francis Barracks seawall and reduce wave-induced erosion to the south waterside corner of the seawall.

The Recommended Plan consists of installation of weepholes spaced approximately every 10 feet. Each weephole will include gravel drainage. Grout will be used to fill the large voids on the waterside of the Barracks in order to prevent the flowable fill (or an equivalent granular, free-draining material) from discharging into the Intracoastal Waterway (ICW). Flowable fill (or an equivalent granular, free-draining material) will be placed at the voids from the ground surface and allowed to flow into the voids beneath the surface. The broken concrete sidewalk at the Judge Advocate General Corps (JAG) building, extending between the JAG building to the seawall, will be removed for easier access to the voids beneath the building. In order to ensure the existing soil loading conditions on the landside of the wall are maintained, only minimal localized excavation of soil from the landside of the wall is planned to gain better access to the voids. Flowable fill (or an equivalent granular, free-draining material) will be placed at the five main areas of erosion concern where large voids exist. Topsoil and sod will be placed on top of flowable fill (or an equivalent granular, free-draining material) in order to restore and maintain the original appearance. The concrete sidewalk in front of the JAG building will be replaced. Shotcrete will be applied on the waterside of the south corner in order to add additional erosion control. In order to ensure that the shotcrete remains in place, an anchoring frame will be connected to the wall. Lastly, stone revetment will be placed at the corner of the seawall in order to provide a wave break to reduce any wave-induced erosion to the structure. The stone revetment will have a maximum radius of 25 feet from

the corner and the adjacent damaged wall sections. Based on the wave climate in this area, the appropriate stone size to handle the waves generated during a 100-year flood surge is granite stone with a diameter of 2.5 feet. The design includes only one layer of stone against the wall.

Details on the final recommendation are contained in the Integrated Feasibility Report and Environmental Assessment (IFR/EA) which is incorporated herein by reference. USACE evaluated a final array of four alternatives, including the No Action Alternative and Recommended Plan. The Recommended Plan meets the objectives of the study to provide emergency shoreline protection through rehabilitation and improvements to the St. Francis Barracks seawall. This alternative provides an emergency solution to the continued erosion that threatens the existing infrastructure. Additionally, the project is within a National Historic Landmark, the highest level a historic property can be designated on the National Register of Historic Places. Therefore, the Recommended Plan is economically justified because the infrastructure is irreplaceable and these features cannot be adequately relocated or replaced and maintain the same level of historical significance.

USACE incorporated all practicable means to avoid and minimize adverse environmental effects into the Recommended Plan. USACE will implement the environmental commitments as detailed in the IFR/EA to minimize adverse effects.

Pursuant to Section 7 of the Endangered Species Act of 1973, as amended, USACE evaluated the potential effects from implementation of the Recommended Plan to Federally threatened and endangered (T&E) species that may occur in the project area. USACE determined the project would have no effect on Federally listed T&E species potentially occurring in the project vicinity.

Construction of the project's revetment is considered fill into the waters of the United States. In compliance with the Clean Water Act of 1972, as amended, (CWA), a Section 404(b)(1) Guidelines evaluation has been completed and is included in the Environmental Appendix D-2. The project will meet the state of Florida's water quality standards. CWA Section 401 water quality certification will be obtained prior to the start of construction. The project will implement and meet all conditions imposed by the necessary authorizations in order to minimize adverse impacts to water quality.

Pursuant to the Coastal Zone Management Act (CZMA), a Federal Consistency Determination (FCD) was submitted to the state of Florida for review and concurrence during this IFR/EA's public comment period. USACE determined that the Recommended Plan is consistent with the state's Coastal Zone Management Program and anticipates receiving concurrence. USACE will comply with CZMA and will implement any applicable conditions. Pertinent correspondence is found in the Environmental Appendix D-1.

USACE prepared this IFR/EA consistent with the October 2, 2019 guidance provided by the NMFS Southeast Regional Office regarding coordination of Essential Fish Habitat (EFH) consultation requirements with NEPA. USACE has determined that the

project would have minimal adverse effects on EFH and no adverse effects on federally managed fish species. Recommendations resulting from the EFH consultation will be considered. Pertinent correspondence is found in the Environmental Appendix D-1.

In accordance with section 106 of the National Historic Preservation Act of 1966, as amended, USACE determined that historic properties may be adversely affected by the recommended plan. USACE and the Florida State Historic Preservation Officer are executing a programmatic agreement. The agreement will outline the process in which USACE will avoid, minimize, or mitigate adverse impacts to historic properties. All terms and conditions resulting from the agreement will be implemented in order to minimize adverse impacts to historic properties.

The draft IFR/EA and associated appendices will be released for a 30-day public and agency review. USACE will respond to all comments submitted during the public comment period and include them in the final EA and FONSI.

USACE considered all applicable laws, executive orders, and regulations in the evaluation of the alternatives. Based on this EA, the reviews by other Federal, State and local agencies, tribes, input of the public, and the review by my staff, it is my determination that the Preferred Alternative would not significantly affect the human environment; therefore, preparation of an Environmental Impact Statement is not required.

Date: \_\_\_\_\_

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Andrew D. Kelly, Jr.  
Colonel, U.S. Army  
District Commander

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## EXECUTIVE SUMMARY

### PURPOSE AND NEED

This report is in response to a request from the Florida Department of Military Affairs asking that the U.S. Army Corps of Engineers (USACE) provide assistance in addressing the erosion behind the Florida National Guard Headquarters seawall. The authority for this project is Section 14 of the Flood Control Act of 1946, as amended, (33 U.S.C. §701r) to prevent damage to public works, other nonprofit public services, and known historic properties whose significance has been demonstrated by a determination of eligibility for listing in, or actual listing in, the National Register of Historic Places (NRHP).

The American-era, 19<sup>th</sup> century seawall was constructed of coquina laid in ashlar courses and topped with a layer of granite coping stones. The wall extends approximately three quarters of a mile along the western bank of the Matanzas River, from the Castillo de San Marcos at the northern end to the St. Francis Barracks at the southern end (**Figure ES-1**). Throughout its length, the average height of the wall varies from 6 to 7 feet (ft.). It measures approximately 6 ft. wide at the base and tapers to 3 ft. wide at the granite coping stone. The seaward face is vertical while the landward side of the wall widens from top to bottom in a series of steps. Massive coquina foundation stones, in excess of 2 ft. thick by 7 ft. wide, support the wall at its base. Construction was completed in 1846, however; when the foundation was laid in 1842, it was set in marsh sediments that lain approximately 2 ft. above the average low water mark for that year. The St. Francis Barracks portion of the seawall is approximately 500 ft. long (**Figure ES-2**). Erosion of the St. Francis Barracks seawall is exacerbated by overtopping which is generally associated with high tide combined with strong winds. The seawall was most recently overtopped during Hurricane Matthew (October 2016), resulting in damage to the concrete pavement between the seawall and the Judge Advocate General (JAG) office building. The St. Francis Barracks section of the seawall experienced additional damage from boats washing into the wall during Hurricane Irma in September 2017. The landward side of the seawall experiences erosion extending the 500 ft. length of the St. Francis Barracks portion of the seawall. The erosion of soil from behind the wall is of concern because of the cultural significance of the wall and surrounding infrastructure. The project is within a National Historic Landmark District, the highest level a historic property can be designated on the NRHP. The purpose of this study is to implement measures to aid in the prevention of further erosion of the St. Francis Barracks seawall to protect the historical structures behind the wall. There is an opportunity to protect the St. Francis Barracks seawall from further erosion and to protect the JAG building and the parade grounds from further deterioration.

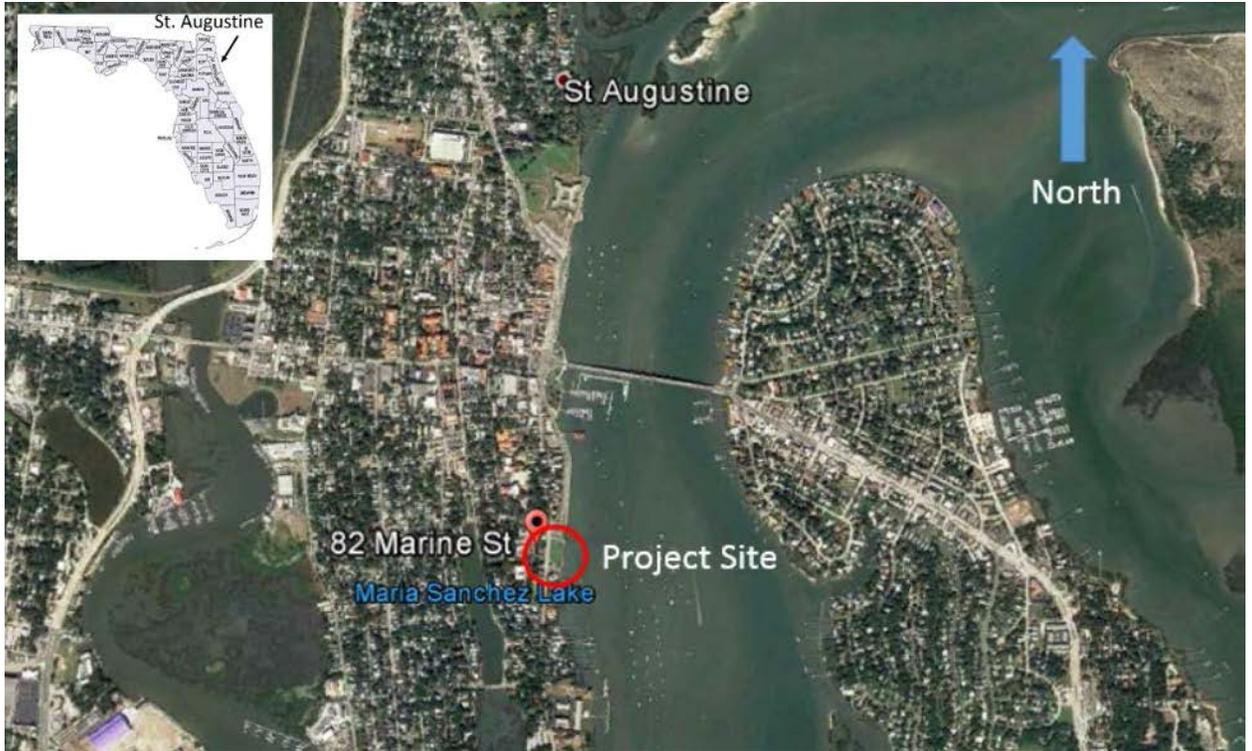


Figure ES-1: Project location



Figure ES-2: Project vicinity map

## ALTERNATIVE PLANS AND THE RECOMMENDED PLAN

### Plan Formulation

Management measures, description of the alternatives that were formulated from those measures, and the results of the alternatives screening are provided in the sub-sections that follow.

### Management Measures

#### Non-structural (NS):

##### NS-1) No Action

\*Other measures that would be considered non-structural would typically be considered under "Relocation. However, the cost to physically relocate the JAG facilities and the parade grounds as well as try to maintain the historical importance of the infrastructure would far outweigh the cost of construction to implement erosion control measures.

#### Structural (S):

### **St. Francis Barracks Seawall Shoreline Erosion Protection CAP Section 14**

DRAFT INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT

EXECUTIVE SUMMARY

- S-1) Construct new wall at the same elevation
- S-2) Construct new wall at a higher elevation
- S-3) Install anchor rods through wall
  - a) Vertically
  - b) Horizontally
- S-4) Seal cracks in the wall
  - a) Spray entire wall with Shotcrete
  - b) Fill holes behind wall with flowable fill (or an equivalent granular, free-draining material)
  - c) Fill holes behind wall with soil
  - d) Fill holes with grout
- S-5) Sheetpile
  - a) Waterside
  - b) Landside
- S-6) Weepholes
- S-7) Revetment

[Alternative Development, and the Recommended Plan](#)

Per ER 1105-2-100, Appendix F, Section III, F-23, alternatives are compared to determine the least cost alternative. The least cost alternative plan is considered to be justified if the total cost of the proposed alternative is less than the cost to relocate the threatened facilities. Therefore, relocation is not considered a “measure” or “alternative” but rather a basis for cost comparison.

The no action measure (NS-1) and all the structural management measures (S-1, S-2, S-3, S-4, S-5, S-6, S-7) were carried forward to form the preliminary array of alternatives. **See Table ES-2.**

**Table ES-1: Alternative Matrix**

	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
S-1					<input checked="" type="checkbox"/>					
S-2		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							
S-3(a)								<input checked="" type="checkbox"/>		
S-3(b)									<input checked="" type="checkbox"/>	
S-4(a)							<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/> *
S-4(b)				<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
S-4(c)		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
S-4(d)				<input checked="" type="checkbox"/>						
S-5(a)						<input checked="" type="checkbox"/>				

EXECUTIVE SUMMARY

S-5(b)						<input checked="" type="checkbox"/>				
S-6		<input checked="" type="checkbox"/>								

The preliminary alternatives were evaluated on their ability to meet the study objectives and not violate study constraints; however, due to the intent of CAP Section 14, a qualitative analysis based on construction costs, erosion protection and impacts to cultural resources was used as screening criteria. See Chapter 3 for further Management Measure screening and Alternative formulation details. Four alternatives were carried forward to the final array: Alternative 1, Alternative 4, Alternative 7, and Alternative 10. The no action alternative is not recommended because continuing storm events will increase erosion and increase the risk to the adjacent buildings. The no action alternative is carried forward for comparison purposes. These alternatives were then discussed with the non-Federal sponsor (NFS) and it was determined that Alternative 10 would be the recommended plan. This determination was based on the four Principle and Guideline criteria: Completeness, Effectiveness, Efficiency and Acceptability. This alternative was carried forward for volume and cost estimate calculations. The Recommended Plan consists of installation of weepholes spaced approximately every 10 feet. Each weephole will include gravel drainage. Grout will be used to fill the large voids on the waterside in order to prevent the flowable fill (or an equivalent granular, free-draining material) from discharging into the Intercoastal Waterway (ICW). Flowable fill (or an equivalent granular, free-draining material) will be placed at the voids from the ground surface, and allowed to flow into the voids beneath. The broken concrete sidewalk at the JAG building, extending between the building to the seawall, will be removed for easier access to the voids beneath. In order to ensure the existing soil loading conditions on the landside of the wall are maintained, only minimal localized excavation of soil from the landside of the wall is planned, to gain better access to the voids. Flowable fill (or an equivalent granular, free-draining material) will be placed at the five main areas of erosion concern where large voids exist as shown in **Figure 3-1** and **Figure 3-2**. Topsoil and sod will be placed on top of flowable fill (or an equivalent granular, free-draining material) in order to maintain the original appearance and the concrete sidewalk in front of the JAG building will be replaced. Shotcrete will be applied on the waterside of the south corner in order to add additional erosion control. In order to ensure that the shotcrete remains in place, an anchoring frame will be connected to the wall. Lastly, stone revetment will be placed at the corner in order to provide a wave break to reduce any wave-induced erosion to the structure. The stone revetment will have a maximum radius of 25 feet from the corner and the adjacent damaged wall sections. Based on the wave climate in this area, the appropriate stone size to handle waves generated during a 100-year flood event is granite stone with a diameter of 2.5 feet. The design includes only one layer of stone against the wall.

**COST ESTIMATE AND ECONOMIC JUSTIFICATION**

The project first cost for the Recommended Plan is \$1,024,000 at FY19 price levels (including contingency, detailed design, and construction management costs); see **Table ES-1**. The Federal costs of the Recommended Plan will be \$665,600, and the on-Federal costs \$358,400, at a 65% Federal and 35% non-Federal cost share. The expected construction duration is approximately 4 months.

Per ER 1105-2-100 Appendix F, Section III, F-23(d), the least cost alternative plan is considered to be justified if the total costs of the proposed alternative are less than the costs to relocate the threatened facility. The project is within a National Historic Landmark District, the highest a historic property can be designated on the National Register of Historic Places. These represent the most important historic

locations in the country. All of the structures on the parcel protected by the seawall are recorded resources, either listed on the Nation Register of Historic Places or recorded as eligible for listing. The buildings are part of the historic resource group of St. Francis Barracks. Simply removing the historic facilities from the affected area and allowing erosion to continue is an unacceptable alternative. Continued erosion will further affect the National Landmark of the City of St. Augustine. The structures behind the seawall include King’s Bakery, the only structure in St. Augustine dating to the British Colonial Period. Since 1763, the area served as military facility operations during the British, Second Spanish, Territorial, and Statehood periods. Relocation of the facilities; which include the JAG building and parade ground; would not maintain the historic significance with the centuries of military activities.

In addition, the City of St. Augustine asserts the maintenance of the historic character as key to the economic life of the city (Historic Preservation Master Plan 2018). The city reports tourism brought in over a billion dollars in 2016 and links this directly to Heritage Tourism. They report 96% of all of the visitors to the county walk through St. Augustine’s historic district, which includes the project. The character of the district is a result of not any one structure, building, or feature, but the combination. The direct benefit is not just to the Florida Army National Guard, but to the National Historic Landmark District and City of St. Augustine.

The cost to physically relocate the JAG facilities and the parade grounds as well as try to maintain the historical importance of the infrastructure would far outweigh the cost of construction to implement erosion control measures. Therefore, construction of erosion control measures with the least cost alternative is the only acceptable course of action.

**Table ES-3: Cost Allocation of the Recommended Plan**

<b>Total Project First Cost (FY19) Price Levels</b>		
<b>WBS</b>	<b>Project Feature</b>	<b>Total Cost \$</b>
10	Breakwater & Seawalls	\$455,000
1	Lands and damages <sup>1</sup>	\$25,000
30	Planning Engineering and Design	\$463,000
31	Construction Management	\$80,000
	<b>Total Project Cost<sup>2</sup></b>	<b>\$1,024,000</b>
1. Lands and damages include temporary easement acquisition for staging area.		
2. Including contingency, detailed design and construction management costs		

**Table ES-4: Cost Allocation of the Recommended Plan.**

<b>Cost Allocation of the Recommended Plan</b>		
<b>Total Project Cost</b>	<b>Federal Maximum 65%:</b>	<b>Non-Federal Minimum 35%</b>
\$ 1,024,000	\$ 665,600	\$ 358,400
<b>Cost Sharing</b>		
	<b>Federal</b>	<b>Non-Federal</b>
Non-Federal LERRD		\$ 10,000
Non-Federal cash requirement		\$ 348,400
<b>Non-Federal Minimum 35%</b>		<b>\$ 358,400</b>
Federal cost	\$ 665,600	
<b>Total Cost Allocation</b>	<b>\$ 665,600</b>	<b>\$ 358,400</b>

#### **COORDINATION WITH AGENCIES AND THE PUBLIC**

USACE has prepared this environmental assessment (EA) to determine whether the proposed Federal action, the Recommended Plan, would significantly affect the human environment and require preparation of an Environmental Impact Statement. This EA, integrated with the feasibility report, has been prepared pursuant to the National Environmental Policy Act of 1969, as amended, 42 U.S.C. §4321, *et seq.* (Public Law 91-190) (NEPA) and its implementing regulations. A Notice of Availability for the draft Integrated Feasibility Report/EA (IFR/EA) and proposed Finding of No Significant Impact (FONSI) will be coordinated with pertinent agencies and interested stakeholders for review and comment for 30 days. The project complies with NEPA and its implementing regulations.

#### **RISK CONSEQUENCE RATING**

Without action, continued erosion of the seawall will occur, resulting in further degradation of the parade field and threatening the structural integrity of the JAG building, found NRHP-eligible by the Florida SHPO, located behind the wall. Structural failure will damage the existing historic building and associated infrastructure increasing safety concerns. This rank is based on the following: An undesirable event is anything which causes adverse consequences. In this case, the undesirable event is structural failure, either partial or total, of the existing buildings' foundations due to continued erosion leading to undermining of the structures. "Risk Level" is an estimate of the time, starting from the present, when an undesirable event is considered most likely to occur based on best professional judgment. The JAG building foundation is currently cracking and the Florida National Guard have stopped utilizing the facility until repairs can be made. The historic JAG building is most at risk of structural damage due to continued erosion. These considerations elevate the Safety Risk Ranking in the Risk Consequence Matrix to a rank of 1, signifying Risk Level A, as shown in **Table ES-5**.

**Table ES-5: Risk Consequence Matrix.**

SAFETY MATRIX RANKING		Consequences Category				
		Category A (highest severity)	Category B	Category C	Category D	Category E (lowest severity)
Risk Level (probability of event)	Level A (0 to 2 years)	1	3	5	7	12
	Level B (2 to 4 years)	2	4	6	8	12
	Level C (4 to 6 years)	3	5	7	9	12
	Level D (6 to 8 years)	4	6	8	10	12
	Level E (Over 8 years)	5	7	9	11	12

Severity of impact from the event decreases from the highest severity in Category A to the lowest severity in Category E. Projects are assigned to the highest severity category for which one or more criteria in the category apply to the project consequences. Category A means that at least one of the following is expected if the undesirable event occurs.

- Adversely impacts transportation routes with Average Daily Traffic (ADT) over 50,000.
- Adversely impacts an affected population over 50,000.
- Adversely impacts an affected disadvantaged population over 20,000.
- Losses with an estimated relocation or replacement cost over \$3,000,000.
- Adverse impacts to facilities critical to public health, safety, security, or welfare.
- Adverse impacts to facilities designated as having national cultural importance.
- Adverse impacts to facilities critical to interstate commerce.
- Loss of life is considered likely if no action is taken.

The severity of impact resulting from the structural failure of the St. Francis Barracks Seawall would meet one of the criteria under Category A:

1. Adverse impacts to facilities designated as having national cultural importance:

The grounds of the project fall within the historic boundary of the City of St. Augustine, initially as part of the Franciscan monastery that served as the headquarters of the Spanish missionary effort across the southeast. The direct area of potential effects has two recorded overlapping terrestrial archaeological sites, 8SJ05570 and 8SJ05687. A single 50-x-70 centimeter test excavation has occurred on the parcel (Halbirt 2005) and documented multiple cultural strata. It did not reach subsoil. The northern portion of the parcel, beneath the parking lot, is not recorded as an archaeological site within the FMSF though this portion falls within the National Landmark District. Additional archaeological deposits associated with the seawall are recorded as 8SJ00010A, 8SJ00010B, 8SJ04971, and 8SJ05696. Protected by the St. Francis

Barracks seawall, it includes the only recorded standing structure in St. Augustine built during the British Colonial Period, King's Bakery, which has been recorded as both 8SJ02517 and 8SJ05551. The site file forms indicate that SHPO has evaluated the structure as eligible for listing in the NRHP as 8SJ05551. The structure is included on the map accompanying the 1986 NRHP nomination form as a contributing element to the National Register District, though it is outside of the described boundaries of the district. The two other historic structures within the project parcel are Building 8: St. Francis Barracks (8SJ05550) and Building 16: St. Francis Barracks (8SJ05555). SHPO determined Building 8 and Building 16 are eligible for listing in the NRHP. The seawall, completed by USACE in 1846, is recorded as sites 8SJ04971 and 8SJ05696. The site boundaries in the FMSF stop at the parcel boundary for St. Francis Barracks. FEMA determined the portion of the seawall adjacent to the project to be eligible for listing in the NRHP. The entire St. Francis Barracks is recorded as resource group 8SJ055570. SHPO found this resource eligible for listing in the NRHP as a building complex. Continued erosion threatens all of these resources either listed in the NRHP, determined to be eligible for listing in the NRHP, or with potential to be listed in the NRHP.

### **RESIDUAL RISK**

Even with implementation of the Recommended Plan, residual risk remains. The Recommended Plan addresses the current soil-loss conditions caused by runoff and wave overwash drainage through large cracks in the seawall as experienced with frequent heavy rains and storm conditions. It is not designed to prevent soil erosion resulting from exacerbated overwash and wave impacts caused by extreme high storm/hurricane events. Residual risk remains that extreme high storm events in the future could excessively overtop and impact the seawall, causing further soil erosion, thus damaging the facilities and ultimately causing the structural stability of the historic JAG building to fail, which the Recommended Plan is not designed to address.

### **CONCLUSION AND RECOMMENDATION**

The Recommended Plan (Alternative 10 – S-7, S-6, S-4a (limited amount), S-4b, and S-4c: Place revetment, install weepholes, fill holes behind wall with flowable fill (or an equivalent granular, free-draining material) with soil, and place shotcrete at the damaged corner) described in this report provides the optimum solution for erosion protection within the study area that can be developed within the framework of the formulation concepts. Implementation of the Recommended Plan for the St. Francis Barracks Seawall Shoreline Erosion Protection, CAP Section 14 Project is recommended at this time, with such modification as the Commander, South Atlantic Division, U.S. Army Corps of Engineers (SAD), deems advisable at their discretion.

# CHAPTER 1

## INTRODUCTION



# 1 INTRODUCTION

## 1.1 STUDY AUTHORITY

Authority for this report is provided by Section 14 of the Flood Control Act of 1946, Public Law 79-526 (33 U.S.C. §701r); as amended, and reads as follows:

The Secretary of the Army is authorized to allot from any appropriations heretofore or hereafter made for flood control, not to exceed \$25,000,000 per year, for the construction, repair, restoration, and modification of emergency streambank and shoreline protection works to prevent damage to highways, bridge approaches, and public works, churches, hospitals, schools, and other nonprofit public services, when in the opinion of the Chief of Engineers such work is advisable: Provided, That not more than \$5,000,000 shall be allotted for this purpose at any single locality from the appropriations for any one fiscal year, and if such amount is not sufficient to cover the costs included in the Federal cost share for a project, as determined by the Secretary, the non-Federal interest shall be responsible for any such costs that exceed such amount.

If an eligible facility is in imminent danger of failure, and a request has been received from a potential non-Federal sponsor stating its desire to participate in a solution, upon a determination that it is in the federal interest, USACE will conduct a feasibility study to analyze the problem, develop a solution, and determine the feasibility of a solution. In the feasibility phase, the first \$100,000 is 100 percent federally funded. Any additional feasibility study costs require an executed Feasibility Cost Sharing Agreement, stating that all costs above the initial \$100,000 are cost-shared 50 percent Federal and 50 percent non-Federal.

## 1.2 STUDY SPONSOR

The study was requested by the Florida Department of Military Affairs, the non-Federal sponsor, in a letter dated October 21, 2016 (see Pertinent Correspondence Appendix (E)). The non-Federal sponsor supports the Recommended Plan to utilize flowable fill (or an equivalent granular, free-draining material), grout, shotcrete, and revetment at the damaged corner to prevent continued erosion.

## 1.3 PROJECT LOCATION

The City of St. Augustine is located in the northeast corner of Florida on the Atlantic Coast within St. Johns County. The project area is located at 28 Marine Street, St. Augustine, St. Johns County, Florida and is the Florida National Guard Headquarters (**Figure 1-1**). The St. Francis Barracks portion of the seawall is approximately 500 ft. long along the Matanzas River. (**Figure 1-2**)

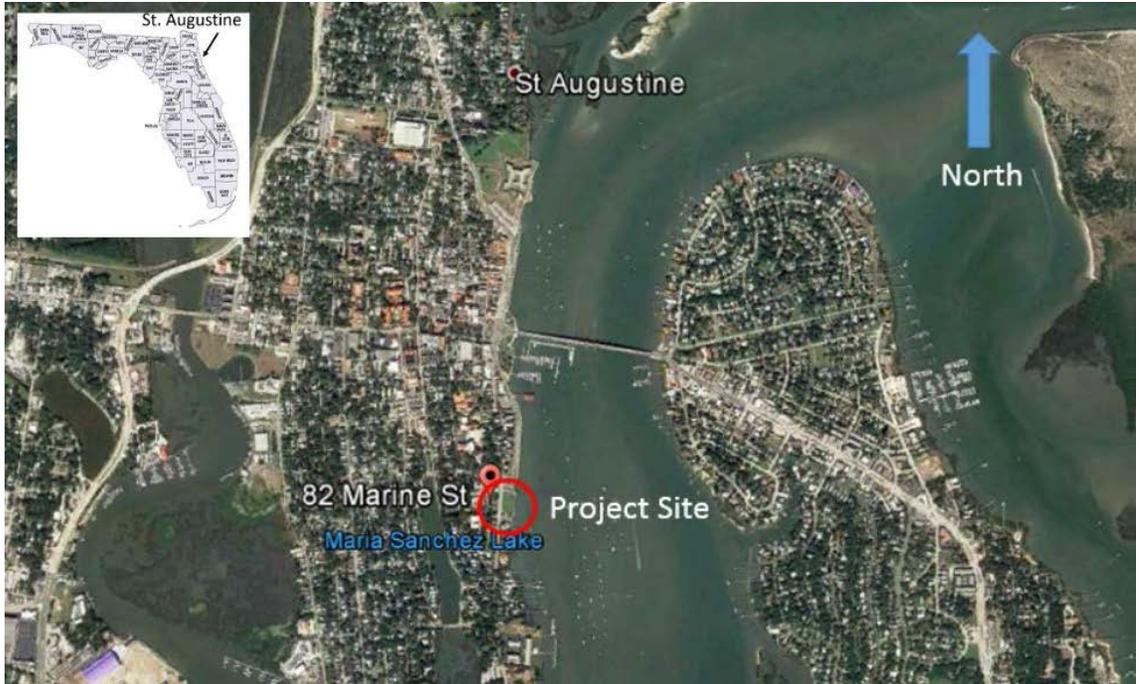


Figure 1-1: Project location of the St. Francis Barracks Seawall



Figure 1-2: Study area map of the St. Francis Barracks Seawall

## 1.4 STUDY PURPOSE AND NEED\*

This report is in response to a request from the Florida Department of Military Affairs, that the USACE Jacksonville District provide assistance in addressing erosion of the St. Francis Barracks seawall. The St. Francis Barracks complex is located in the historic city of St. Augustine, Florida. The potential project site includes 500 feet of the St. Francis Barracks seawall, the historic JAG office building, the parade field, and associated parking facilities (see **Figure 1-2**). The purpose of this study is to determine if constructing protection features to prevent erosion from damaging the cultural facilities at St. Francis Barracks is feasible and economically justified. The study identifies the least cost alternative and the Recommended Plan is justified if total project costs are less than the cost of relocating the threatened facilities. See ER 1105-2-100 at F-31. Federal costs are limited to not more than \$5,000,000 for one locality. Cost of lands, easements, rights-of-way, relocations of utilities, disposal areas, and the operation and maintenance of the project, once completed, are non-Federal responsibility.

Section 14 of the Flood Control Act of 1946, as amended, provides for implementation of projects to protect known historic properties whose significance has been demonstrated by a determination of eligibility for listing in, or actual listing in, the NRHP and are in imminent threat of damage or failure related to natural erosion processes on shorelines. The St. Francis Barracks JAG office is under threat of damage or failure from continuing shoreline erosion at the site. Therefore, the project's purpose is consistent with the requirements of the Section 14 program. Under the authority of the Section 14 program, this study intends to formulate a simple solution that requires minimal design efforts to stop the erosion problem at the St. Francis Barracks seawall.

## 1.5 PRIOR STUDIES\*

In 2011, a Feasibility report and Environmental Assessment (EA) was written for the City of St. Augustine and the Federal Emergency Management Agency (FEMA) by URS Group, Inc. for the portion of the seawall to the north of the St. Francis Barracks seawall. In 2016, Taylor Engineering led a multidisciplinary team and authored a report for design and construction to replace the Avenida Menendez seawall for the City of St. Augustine. Both of these reports however, stopped at the St. Francis Barracks portion of the seawall.

## 1.6 DECISIONS TO BE MADE\*

There are three decisions to be made in this project's Integrated Feasibility Report/EA. The first decision is whether to recommend constructing emergency shoreline erosion protection at the St. Francis Barracks complex. The second decision is to determine if the Recommended Plan will result in significant effects on the quality of the human environment. Thirdly, this document will decide whether there is a need for mitigation measures or best management practices (BMPs) to reduce any potential adverse effects from the Recommended Plan. If no significant effects are identified during the NEPA process, USACE would sign the Finding of No Significant Impact (FONSI) and move forward with the Recommended Plan. If significant effects are identified, USACE will choose to: implement mitigation measures to reduce the effects to a lower-than-significant threshold, proceed with a Notice of Intent to prepare an Environmental Impact Statement, or not implement the Recommended Plan.

This document concludes that the project is in the public interest and would not significantly affect the human environment or require environmental mitigation. (See Chapter 5 for a detailed

### **St. Francis Barracks Seawall Shoreline Erosion Protection CAP Section 14**

DRAFT INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT

## CHAPTER 1: INTRODUCTION

discussion on the effects of the Recommended Plan.) Environmental commitments, as discussed in Chapter 6, will be included in the contract specifications. In addition, USACE and its contractors commit to avoiding and minimizing for adverse effects during construction activities.

**CHAPTER 2**  
**EXISTING AND**  
**FUTURE WITHOUT**  
**PROJECT CONDITIONS**



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## 2 EXISTING AND FUTURE WITHOUT PROJECT CONDITIONS\*

This chapter describes the general, natural, physical, and socioeconomic factors that exist in the project area and could be affected if none of the alternatives were implemented. This chapter does not describe the entire existing environment, but only the resources relevant to the decisions to be made. The future without-project condition (or No Action Alternative) is described in Engineering Regulations (ER) 1105-2-100 as the most likely condition expected to exist in the future in the absence of the proposed project. This chapter, in conjunction with the description of the future without-project conditions, forms the baseline for determining the effects of the Recommended Plan and reasonable alternatives.

### 2.1 GENERAL ENVIRONMENTAL SETTING

#### EXISTING CONDITIONS

The Florida Department of Military Affairs (DMA) is headquartered at St. Francis Barracks in St. Augustine, Florida and is composed of both the Florida Army National Guard and Florida Air National Guard. The joint headquarters is responsible for more than one billion dollars in Federal property, 55 armories, and over 73,000 acres in training lands. The Florida DMA provides management oversight and administrative support to the Florida National Guard (FLNG). FLNG provides ready military units and personnel to support national security objectives, protection of the public safety of citizens, and contributions to national, state, and community programs and initiatives that add value to the United States and to the State of Florida (DMA 2019).

The St. Francis Barracks seawall is located between the Matanzas River and the DMA property, specifically the Judge Advocate General Corps (JAG) building, parade grounds, and parking lot (see **Figure 1-2**). The tidal range in the project area averages approximately 5 feet (NOAA 2019), with the low tide exposing the shoreline in front of the seawall and high tide occasionally overtopping the seawall, if accompanied with strong winds. When the St. Francis Barracks seawall is overtopped, sediments landward of the seawall are eroded as the overwash drains through large cracks, holes, and/or voids in the seawall. Despite the erosion, facilities in the project area continue to be operational and are properly maintained. The JAG building was recently repaired due to storm damages from hurricanes; however, the building remains at risk for structural failure as the ongoing erosion continues to cause instability concerns at the seawall's southeast corner.

The average winter and summer temperatures in St. Augustine are 42°F and 88.8°F, respectively, with the highest average temperatures occurring in July and the lowest average temperatures occurring in January (Weather-and-climate.com 2019). The total annual precipitation in St. Augustine is approximately 39.37 inches, with the majority of rainfall occurring from June through September. St. Augustine is also susceptible to hurricane activity. Records from the National Oceanic and Atmospheric Administration's (NOAA) National Hurricane Center indicate that St. Augustine is subject to some degree of hurricane or tropical storm activity almost every other year (NOAA 2019a). The storms generate strong winds and rain in the study area. Most recently, St. Augustine experienced damages in October 2016 from Category 3 Hurricane Matthew. More detailed information on climate change and sea level rise considerations for this project are discussed in this report's section 4.5 (sea level change considerations) as well as Appendix A (Engineering).

FUTURE WITHOUT-PROJECT CONDCTIONS (NO ACTION ALTERNATIVE)

The future without-project condition (or No Action Alternative) is described in ER 1105-2-100 as the most likely condition expected to exist in the future in the absence of the proposed water resources project. If no action is taken, the St. Francis Barracks seawall will eventually fail. Without repairs, the area landward of the seawall will continue to experience damages from erosion. Eventually, the erosion at the southeast corner of the seawall will threaten the structural integrity of the JAG building, which would increase the existing risk of losing the structure. The DMA would be forced to relocate operations in the JAG building to protect human health and life safety. Ongoing erosion may eventually affect the purpose and use of the parade grounds and/or parking lot.

**2.2 VEGETATION AND WETLANDS**

EXISTING CONDITIONS

The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) identifies the Matanzas River as “Estuarine and Marine Deepwater”. Two areas seaward of and adjacent to the seawall are identified as “Estuarine and Marine Wetland” (see Figure 2-1). The project area landward of the seawall is characterized by upland vegetation, mainly landscaped grasses, around the St. Francis Barracks facilities. Due to the seawall, there is not natural progression from the vegetation located seaward of the seawall to the upland habitat.

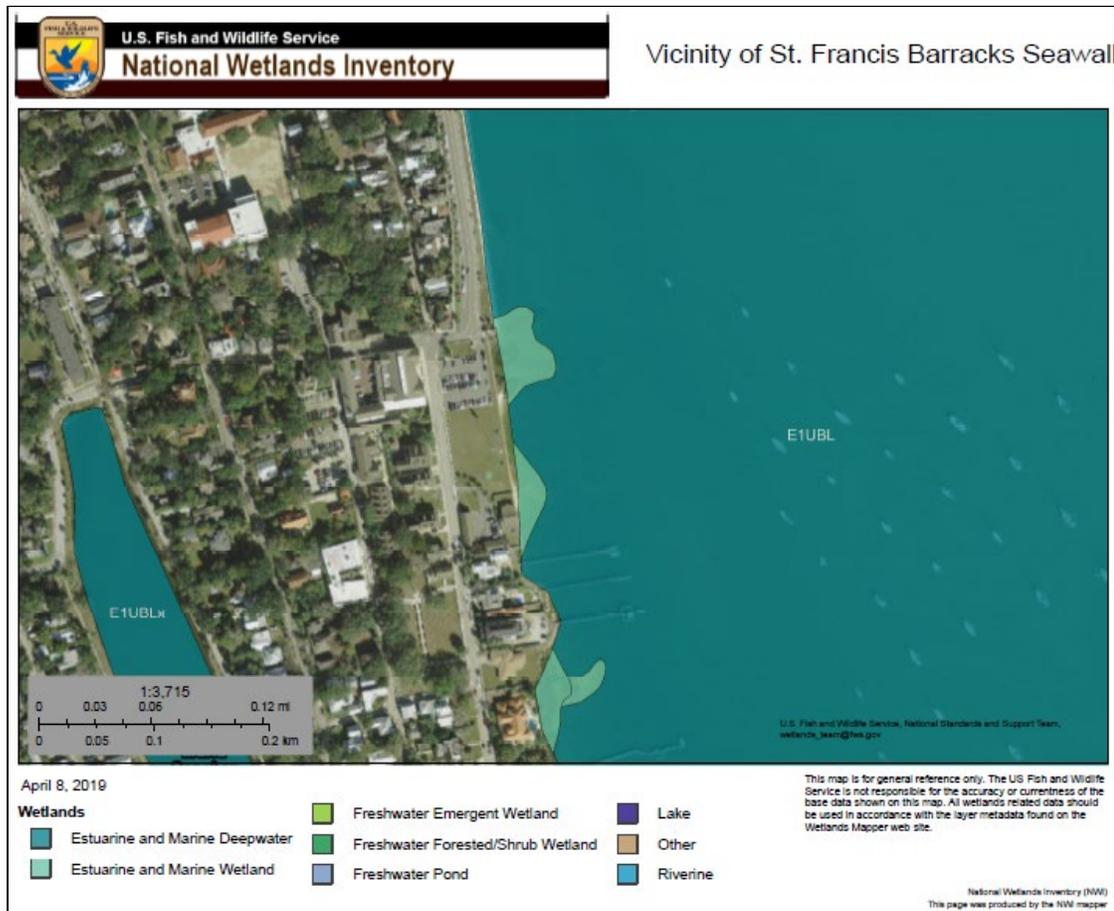


Figure 2-1: NWI wetlands mapper (Source: USFWS NWI 2019).

The section identified as “Estuarine and Marine Wetland” at the north end of the seawall contains a small mangrove stand and grasses (see **Figure 2-2**). The southern section, located just north of the JAG building, contains sparse amounts of mangroves and grasses (see **Figure 2-3**). Both of these areas are exposed at low tide and covered by water at high tide.



**Figure 2-2: Vegetation in the NWI-identified “Estuarine and Marine Wetland” location at the north end of the seawall. (Photo taken by USACE staff during February 2019 site visit.)**



**Figure 2-3: Vegetation in the NWI-identified “Estuarine and Marine Wetland” location just north of the JAG building. (Photo taken by USACE staff during February 2019 site visit.)**

FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

If no action is taken, the ongoing erosion will continue to reduce the available habitat for upland vegetative growth landward of and adjacent to the seawall. Wetland habitat located seaward of and adjacent to the seawall will likely continue to support the currently growing vegetation.

## 2.3 THREATENED AND ENDANGERED (T&E) SPECIES

EXISTING CONDITIONS

The Recommended Plan activities have the potential to affect the Federally listed threatened and endangered (T&E) species as shown in Table 2-1 and described in this section. These species may forage in the project area or transit nearby in the Matanzas River, and therefore, must be considered as part of the design and construction of project.

**Table 2-1. Federally listed T&E species potentially occurring in the project vicinity.**

Common Name	Scientific Name	Listing Status
Florida manatee	<i>Trichechus manatus latirostris</i>	T
American alligator	<i>Alligator mississippiensis</i>	T <sup>1</sup>
Green sea turtle	<i>Chelonia mydas</i>	T <sup>2</sup>
Loggerhead sea turtle	<i>Caretta caretta</i>	T <sup>3</sup>
Kemp’s ridley sea turtle	<i>Lepidochelys kempii</i>	E
Smalltooth sawfish	<i>Pristis pectinata</i>	E
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E
Atlantic sturgeon	<i>Acipenser oxyrinchus oxyrinchus</i>	E

T = Threatened; E = Endangered; <sup>1</sup>Listing status due to similarity of appearance to another T&E species; <sup>2</sup>North Atlantic Distinct Population Segment (DPS); <sup>3</sup>Northwest Atlantic DPS

*West Indian (Florida) manatee*

The USFWS listed manatees as endangered throughout its range for both the Florida and Antillean subspecies (*Trichechus manatus latirostris* and *Trichechus manatus manatus*) in 1967 (32 FR 4001). In May 2017, the USFWS reclassified the manatee from endangered to threatened. The Florida manatee is a subspecies of the West Indian manatee (*Trichechus manatus*) and can be found throughout the southeastern United States. The manatee is a large, plant-eating aquatic mammal that move between freshwater and saltwater environments. They can be found in shallow coastal waters, rivers, and springs. Adult manatees are approximately 10 feet long, weighing between 800 – 1200 pounds, and consume approximately 4-9% of their body weight each day. Although manatees feed underwater, they frequently rest just below the water surface with only the snout above water.

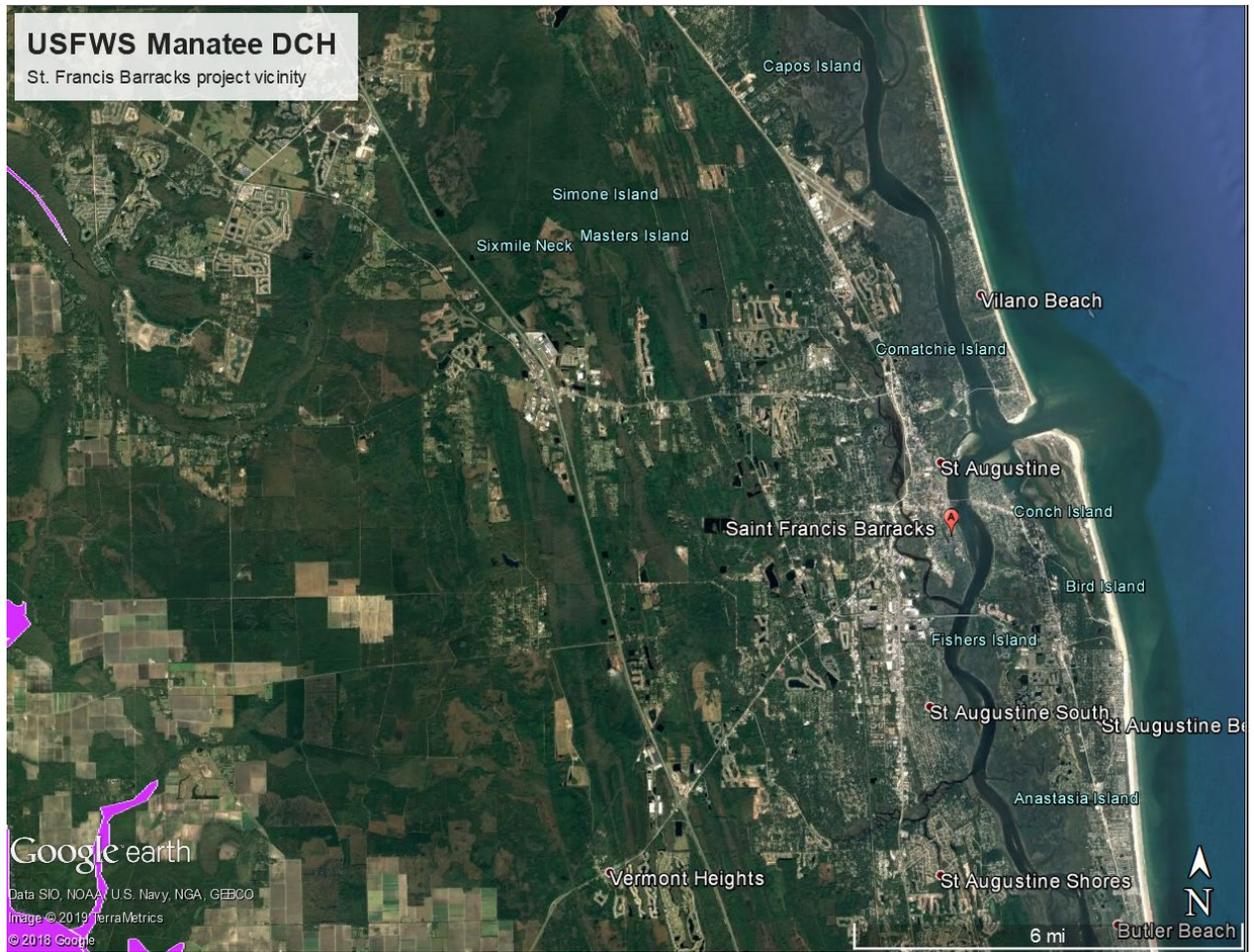
Federal law, specifically the Marine Mammal Protection Act of 1972 and the 1973 ESA protects manatees. Critical habitat is defined under the ESA as specific areas within and/or outside a geographical area that are occupied by a species at the time of listing, that contain physical or biological features essential to the conservation of the species and therefore require special management considerations or protection for the benefit of the species. Although critical habitat for the Florida manatee was described in 1976 in 50 CFR 17.95 for Florida, the project area is not within a USFWS designated critical habitat (DCH) (see **Figures 2-4** and **2-5**) for this species or a Florida Fish and Wildlife Conservation Commission Manatee Protection Zone (see **Figure 2-6**).



**Figure 2-4. USFWS Florida manatee statewide DCH.**

(Source:

[https://www.fws.gov/northflorida/manatee/2009\\_CH\\_Petition/20100112\\_frn\\_Federal%20Register\\_manatee\\_12-mo\\_325.pdf](https://www.fws.gov/northflorida/manatee/2009_CH_Petition/20100112_frn_Federal%20Register_manatee_12-mo_325.pdf))



● Manatee DCH  
**Figure 2-5. USFWS Florida manatee DCH, zoomed to project vicinity.**  
(Source: Resources at Risk layer, USACE Regulatory Division)

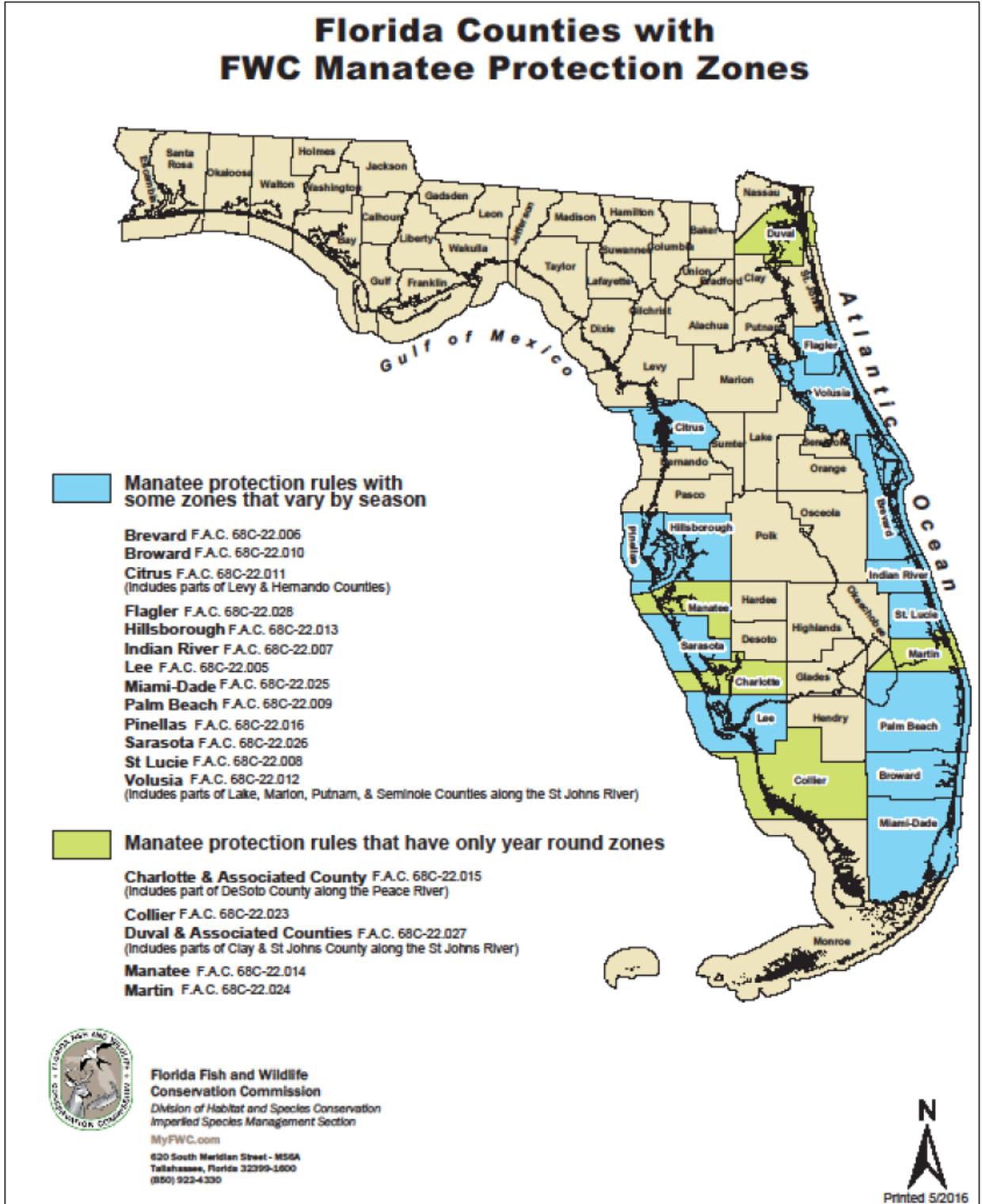


Figure 2-6. Florida Fish and Wildlife Conservation Commission (FWC) manatee protection zones. (Source: <http://myfwc.com/media/2944209/MPZStatewideMap.pdf>)

American alligator

The USFWS first classified the American alligator (*Alligator mississippiensis*) as endangered in 1967 (32 FR 4001) due to concern over poorly regulated or unregulated harvesting. The species has had a rapid recovery; however, only portions of the species' range were later reclassified to "threatened" status. Presently, American alligators in Florida are classified as "threatened due to similarity of appearance in Florida, reflecting complete recovery" (50 FR 25672) due to their similar appearance to American crocodiles (*Crocodylus acutus*), which is listed as threatened. No DCH has been identified for this species. American alligators and American crocodiles are both semi-aquatic species that can range in length from 6-14 feet and are dark, almost black, in color. The main difference in appearance between the two species is the snout. The American alligator's snout is untapered and rounded at the end. Additionally, all teeth are concealed when the mouth is closed. The adults' diet consists of fish, crabs, birds, turtles, snakes, and small mammals whereas the young will feed mainly on aquatic invertebrates and small fish.

Sea turtles: Green sea turtles, loggerhead sea turtles, and Kemp's ridley sea turtles

NMFS and USFWS share jurisdiction over sea turtles. NMFS purview extends to swimming sea turtles whereas USFWS purview covers nesting sea turtles. Green sea turtles (*Chelonia mydas*), loggerhead sea turtles (*Caretta caretta*), and Kemp's ridley sea turtles (*Lepidochelys kempii*) may occur in the project vicinity. Kemp's ridley sea turtles were listed as endangered on December 2, 1970 (35 FR 18320). No DCH has been identified for this species. Considered the smallest sea turtle in the world, adult Kemp's ridley sea turtles can weigh an average of 100 pounds with an almost circular carapace (often as wide as it is long) measuring between 24-28 inches in length. The carapace is a grayish green color and the plastron is pale yellow to cream. Their diet consists mainly of swimming crabs, but may also include fish, jellyfish, and an array of mollusks.

Green sea turtles were listed as threatened on July 28, 1978 (43 FR 32800). In 2016, 11 distinct population segments (DPS) of green sea turtles were listed, including the North Atlantic DPS (81 FR 20057). NMFS listed DCH for green sea turtles in 1998 at Culebra Island in Puerto Rico (63 FR 46693). The green sea turtle can grow up to approximately four feet and weigh approximately 440 pounds. It has a heart-shaped shell, small head, and single-clawed flippers with a smooth carapace colored gray, green, brown and black. Hatchlings are black on top and white on the bottom. Hatchling green turtles eat a variety of plants and animals, but adults feed almost exclusively on seagrasses and marine algae. Most green turtles spend the majority of their lives in coastal foraging grounds, which include shallow waters in both open coastline and protected bays and lagoons.

Loggerhead sea turtles were listed as threatened on July 28, 1978 (43 FR 32800). In 2011, 9 distinct population segments (DPS) were listed, including the Northwest Atlantic Ocean DPS (76 FR 58868). Both NMFS and USFWS have identified DCH for the loggerhead sea turtle within the same region as the project; however, none is located within the project area (see **Figures 2-7, 2-8, and 2-9**). The loggerhead sea turtle can weigh an average of about 200 pounds and is characterized by a large head with blunt jaws. Adults and subadults have a reddish-brown carapace, scales on the top of the head, and flippers with reddish-brown tops and yellow on the borders. The loggerhead feeds on mollusks, crustaceans, fish, and other marine animals. Loggerhead sea turtles may be found hundreds of miles out to sea, as well as in inshore areas such as bays, lagoons, salt marshes, creeks, ship channels, and the mouths of large rivers.

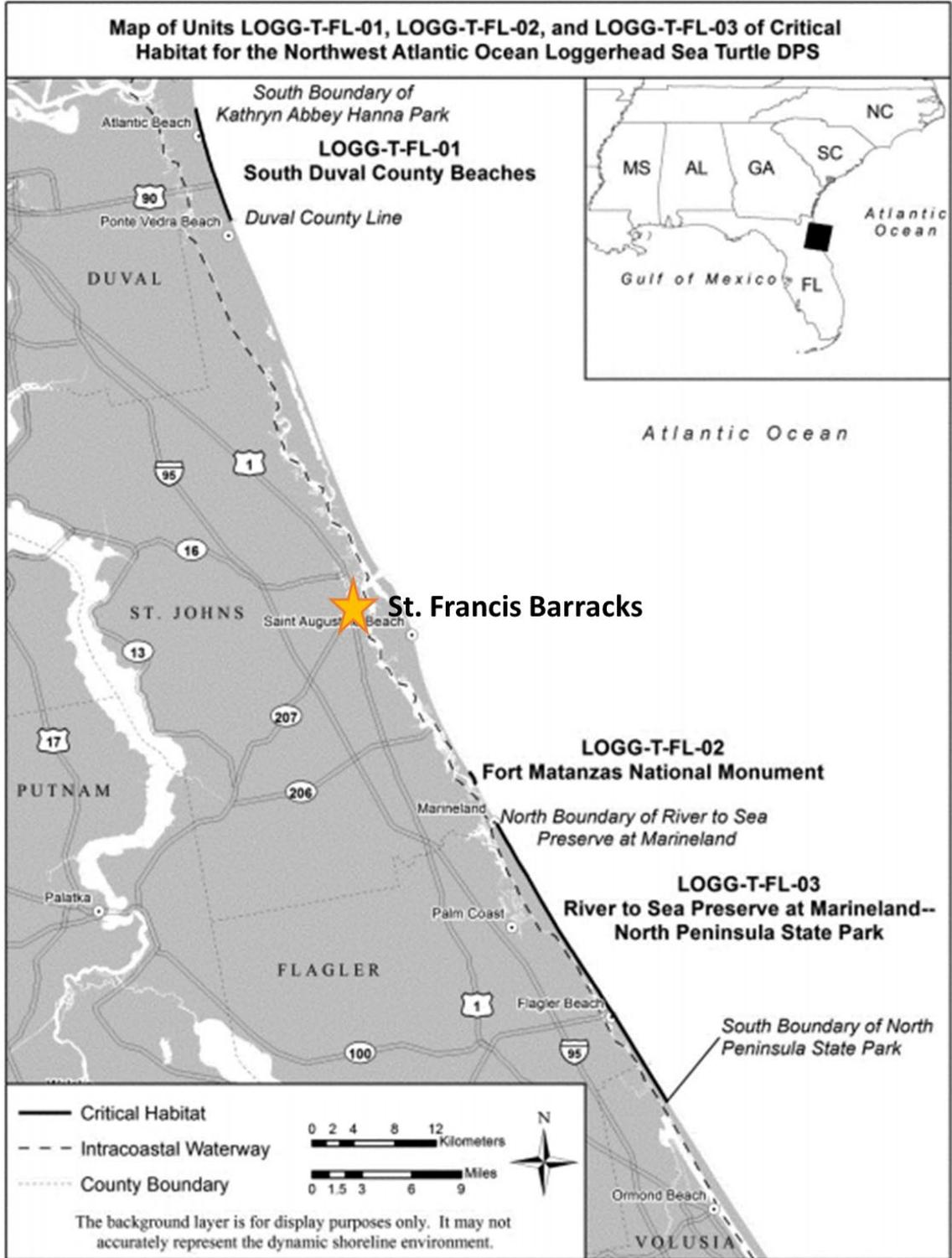
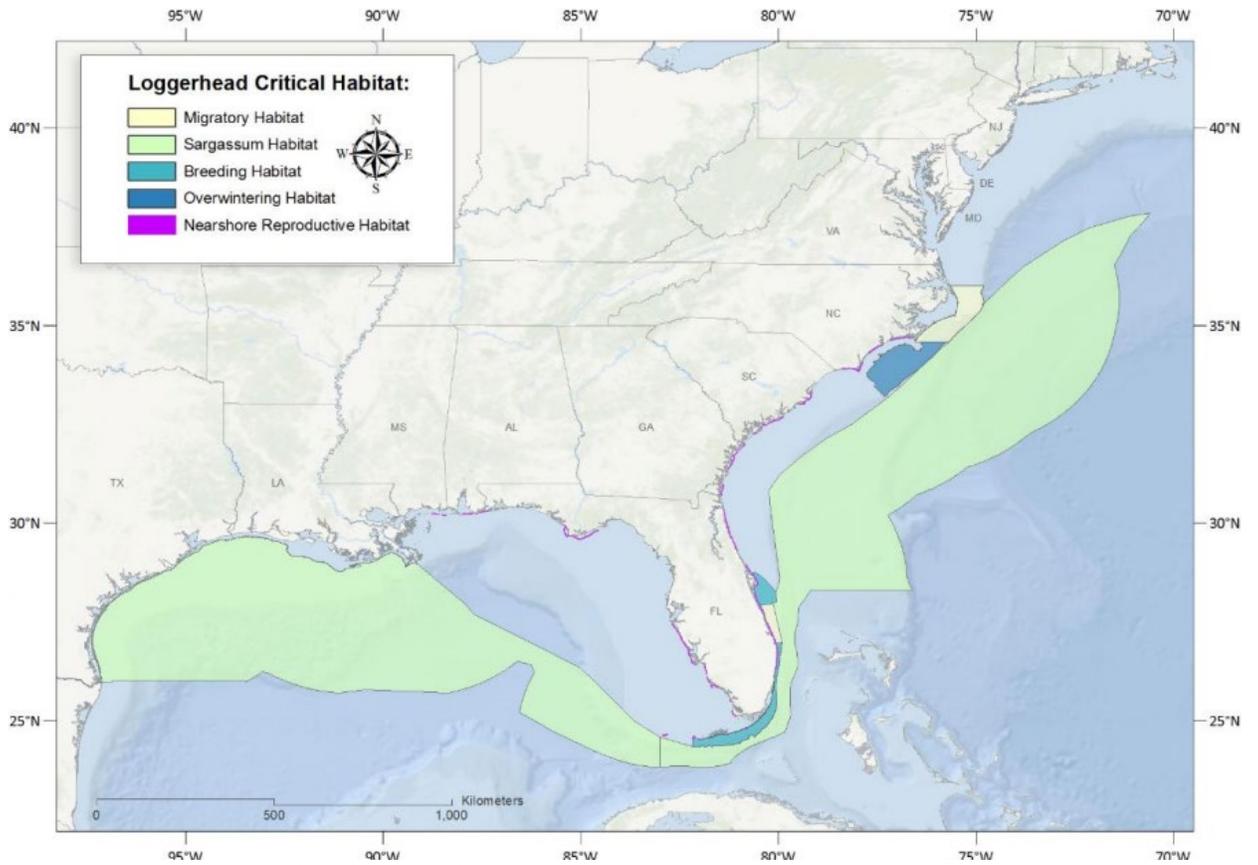
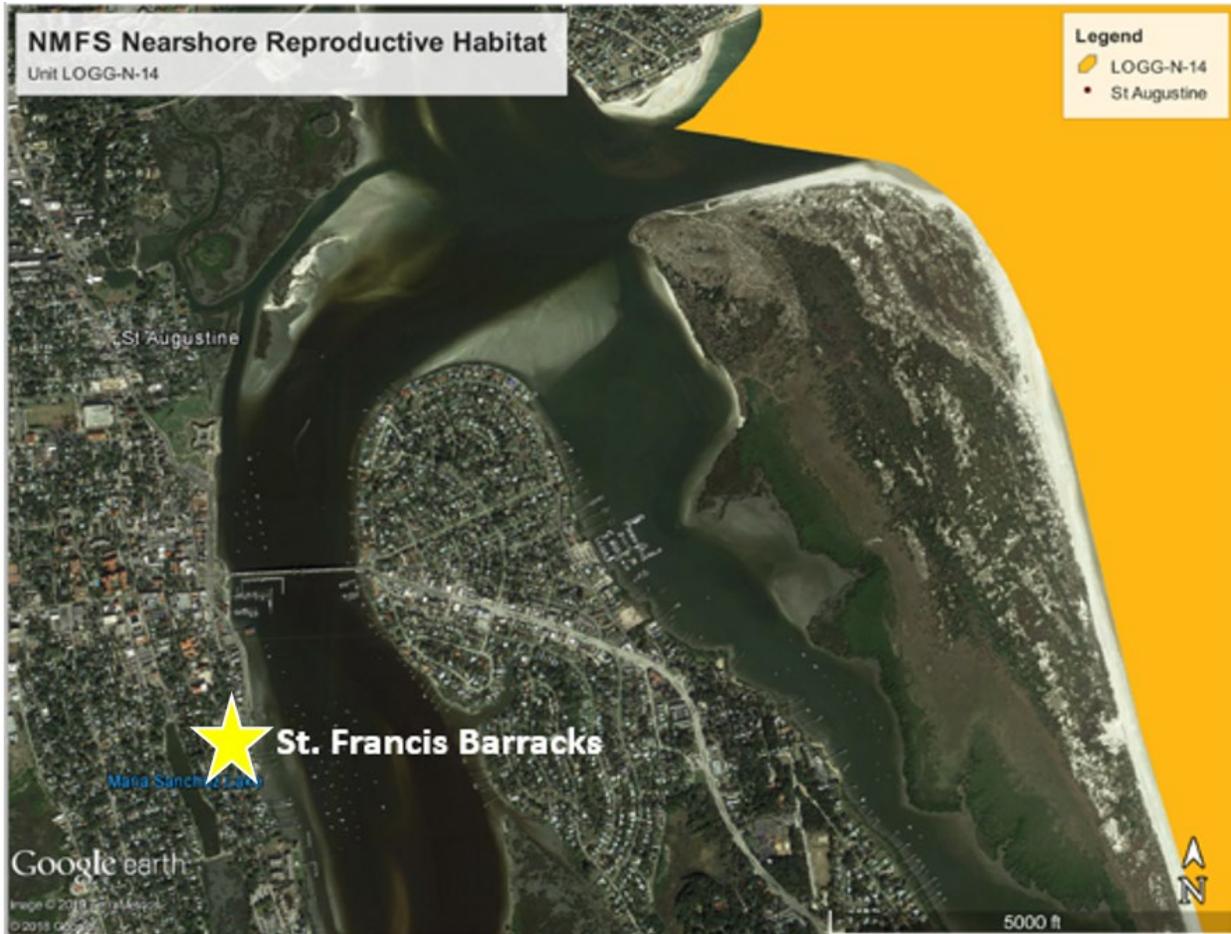


Figure 2-7. USFWS loggerhead sea turtle DCH.

(SOURCE: <https://www.govinfo.gov/content/pkg/FR-2014-07-10/pdf/2014-15725.pdf>)



**Figure 2-8. NMFS loggerhead sea turtle DCH.**  
(SOURCE: <file:///C:/Users/K3PDEKLS/Desktop/LoggerheadCH.pdf>)



**Figure 2-9. NMFS loggerhead sea turtles nearshore reproductive habitat, zoomed to project vicinity.**

(SOURCE: USACE Regulatory Division Resources-at-Risk Layer)

#### Smalltooth sawfish (STSF)

The smalltooth sawfish (*Pristis pectinata*) (STSF) was listed as endangered by NMFS on April 1, 2003 (68 FR 15674). NMFS designated critical habitat in the southwest of Florida for the species in 2009. This species has become rare along the southeastern Atlantic and northern Gulf of Mexico coasts of the U.S. during the past 30 years. Its known primary range is now reduced to the coastal waters of Everglades National Park in extreme southern Florida, with rare sightings outside of that area. Fishing and habitat degradation have extirpated the STSF from much of this former range. The STSF is distributed in tropical and subtropical waters worldwide. It normally inhabits shallow waters (33 feet or less), often near river mouths or in estuarine lagoons over sandy or muddy substrates, but may also occur in deeper waters (66 feet) of the continental shelf. Shallow water less than 3.3 feet deep is an important nursery area for young STSF and maintenance and protection of these habitat is an important component of the “Recovery Plan for STSF (*Pristis pectinata*).” (NMFS 2009). Recent studies indicate that key habitat features (particularly for immature individuals) nominally consist of shallow water, proximity to mangroves, and estuarine conditions. STSF grow slowly and mature at about 10 years of age. Females bear live young, and the litters reportedly range from 15 to 20 embryos requiring a year of gestation. Their diet consists of macroinvertebrates and fishes such as herrings and mullets. The saw is reportedly used to rake surficial

#### **St. Francis Barracks Seawall Shoreline Erosion Protection CAP Section 14**

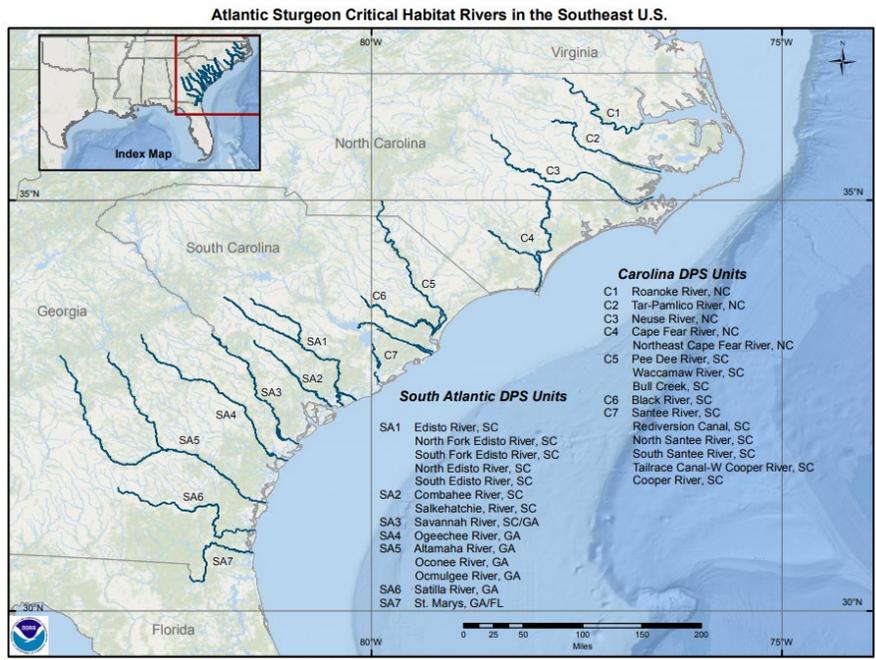
FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT

sediments in search of crustaceans and benthic fishes or to slash through schools of herrings and mullets (NMFS 2009).

Sturgeon: Shortnose sturgeon and Atlantic sturgeon

The shortnose sturgeon (*Acipenser brevirostrum*) was listed as endangered on March 11, 1967 (32 FR 4001). There is no DCH listed for this species. Five DPSs of the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) were Federally listed on February 6, 2012. Of the five listed, the two most likely occurring DPS in the southeast region of the US include the endangered Carolina and South Atlantic DPS (77 FR 5914). NMFS designated critical habitat for the DPSs in 2017 (82 FR 39160); however, no DCH is located in or near the project area (see **Figure 2-10**).

Shortnose and Atlantic sturgeon live in rivers and coastal waters from Canada to Florida. Hatched in the freshwater of rivers, Atlantic sturgeon head out to sea as juveniles, and return to their birthplace to spawn, or lay eggs, when they reach adulthood. Unlike Atlantic sturgeon, shortnose sturgeon tend to spend relatively little time in the ocean. Shortnose sturgeon hatch in the freshwater of rivers and spend most of their time in the estuaries of these rivers. Atlantic sturgeon are slow-growing and late-maturing, and have been recorded to reach up to 16 feet in length, weigh up to 800 pounds, and live up to 60 years of age. Similarly, shortnose sturgeon are also slow-growing and late-maturing. They have been recorded to reach up to 4.5 feet in length, weigh up to 60 pounds, and live 30 years or more. Atlantic sturgeon are similar in appearance to shortnose sturgeon, but can be distinguished by their larger size, smaller mouth, different snout shape, and scutes. Additionally, Atlantic sturgeon are bluish-black or olive brown dorsally (on their back) with paler sides and a white belly whereas shortnose sturgeon are yellowish-brown and generally have a black head, back, and sides with white to yellow bellies. Both sturgeon are bottom feeders and use their four barbels to search for food in the sandy, muddy bottom of rivers. They use a vacuum-like mouth to suck up this bottom-dwelling food, typically eating invertebrates such as insects, crustaceans, worms, and mollusks.



**Figure 2-10. NMFS Atlantic sturgeon DCH.**

(SOURCE:

[https://sero.nmfs.noaa.gov/maps\\_gis\\_data/protected\\_resources/critical\\_habitat/images/atlantic\\_sturgeon\\_critical\\_habitat.pdf](https://sero.nmfs.noaa.gov/maps_gis_data/protected_resources/critical_habitat/images/atlantic_sturgeon_critical_habitat.pdf))

FUTURE WITHOUT PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

No significant change is expected to occur to threatened and endangered species if no action is taken.

## 2.4 FISH AND OTHER WILDLIFE SPECIES

EXISTING CONDITIONS

A variety of invertebrates and demersal fishes can be found in the project vicinity. Invertebrate species include infaunal and epifaunal species represented by worms, gastropods, bivalves, crustaceans, and echinoderms. Demersal feeding fishes prey on most of these species. The bottlenose dolphin is also common throughout the coastal waters of St. Johns County and may be in the project vicinity.

Upland wildlife typically found in the project area would include small mammals such as squirrels, rabbits, and raccoons, as well as reptiles and amphibians, such as snakes, frogs, and lizards. A number of birds also occur in and around the project area, including a number of species considered birds of conservation concern by the Migratory Bird Treaty Act (16 U.S.C. §§703-712). In the past 10 years, over 300 species of birds have been sighted in St. Johns County and documented in eBird, a worldwide citizen science project managed by the Cornell Lab of Ornithology (eBird 2019).

FUTURE WITHOUT PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

No significant change is expected to occur to fish and other wildlife if no action is taken.

## 2.5 ESSENTIAL FISH HABITAT (EFH)

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires Federal agencies to consult with NMFS on activities that may adversely affect essential fish habitat (EFH). South Atlantic Fish Management Council (SAFMC) defines EFH as “those waters and substrate necessary to fish for spawning, breeding, or growth to maturity” (SAFMC 1998).

SAFMC designated seagrasses, corals, coral reefs, hardbottom, and unconsolidated sediments as EFH. Unconsolidated habitats are EFH for cobia (*Rachycentron canadum*), black seabass (*Centropristis striata*), king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*S. maculatus*), spiny lobster, and pink shrimp (*Farfantepenaeus duorarum*). SAFMC also designated corals, coral reefs, hardbottoms, and seagrass as Habitat Areas of Particular Concern (HAPC), which is a subset of EFH that is either rare, particularly susceptible to human-induced degradation, especially important ecologically, or located in an environmentally stressed area. In light of their designation as EFH-HAPC’s and Executive Order (E.O.) 13089, NMFS applies greater scrutiny to projects affecting corals, coral reefs, hardbottoms, and seagrass to ensure practicable measures to avoid and minimize adverse effects to these habitats. There are no HAPCs located in the project area.

FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

No significant change to EFH is expected to occur if no action is taken.

## 2.6 SEDIMENTS

### EXISTING CONDITIONS

Three borings were provided by the Florida Geological Survey within the vicinity of the project area. The materials encountered included fine to coarse-grained sand-sized quartz with variable amounts of shell and shell fragments, silt, and clay. Section 3 of the Engineering Appendix (A) contains more details on the geotechnical analysis.

### FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

Without a project, the sediments landward of the seawall will continue to erode away during overtopping events.

## 2.7 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)

### EXISTING CONDITIONS

Using the Florida Department of Environmental Protection's (FDEP) Map Direct tool, a search for contamination sites was conducted in the project area. The Map Direct tool lists one petroleum site; an underground storage tank, at the FLNG. Other petroleum sites and waste sites (i.e. gas stations, convenience stores, dry cleaners, etc.) are listed as sources of hazardous wastes within approximately 1 mile of the project area (**see Figure 2-11**). No brownfields or superfund sites were located in the project vicinity. Additional environmental site assessments will be completed during the Design and Implementation (D&I) Phase.

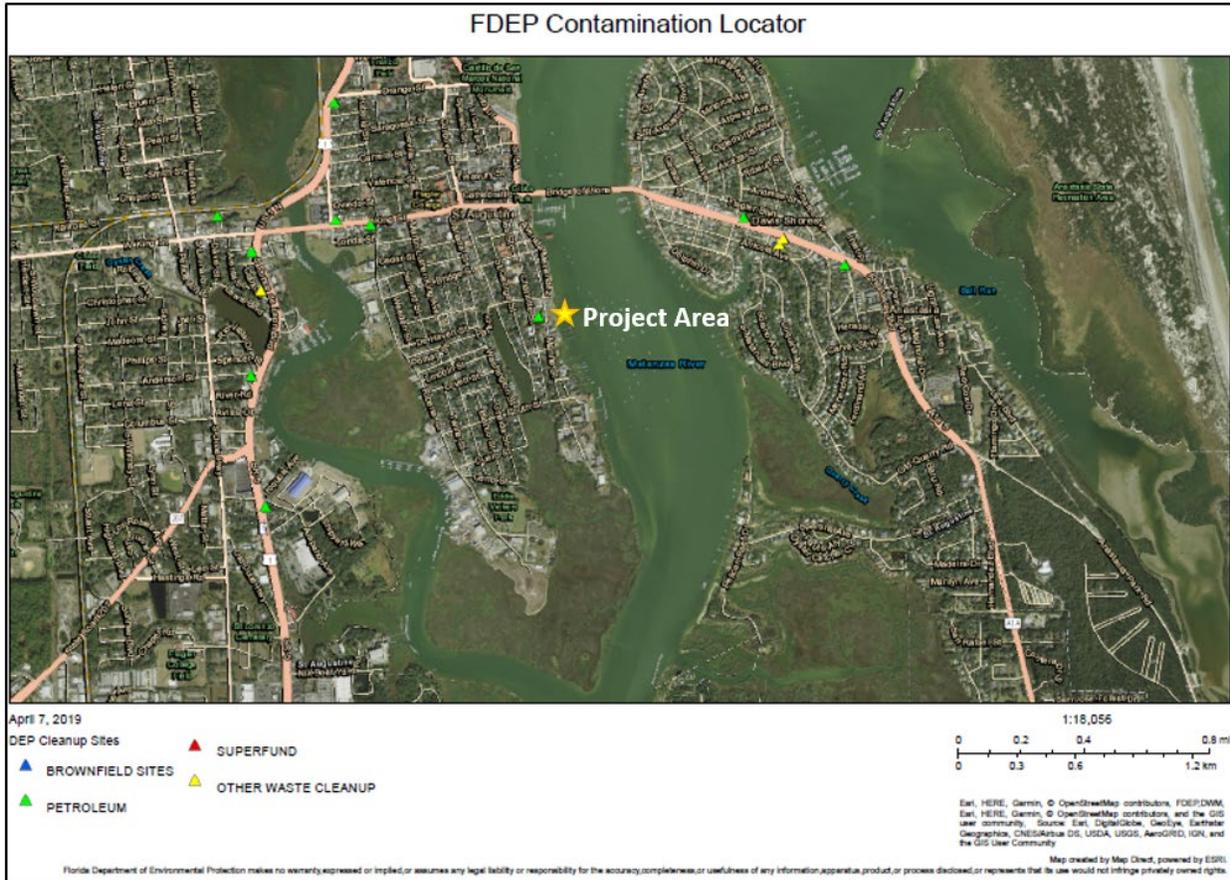


Figure 2-11: FDEP listed contamination sites located in the vicinity of the project. (Source: FDEP Map Direct).

FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

HTRW conditions in the project area will remain the same if no action is taken.

**2.8 WATER QUALITY**

HYDROLOGY EXISTING CONDITIONS

The project area is located on the Matanzas River, which is approximately 35 miles long and part of the Intracoastal Waterway (ICW). Most of the river is saltwater as it is connected to the ocean by two inlets: St. Augustine and Matanzas. The project is located near the northern end of the river and is tidally influenced. When the sediments landward of the seawall are disturbed by overtopping events, erosion occurs, resulting in turbid water and ecologically undesirable conditions. See Appendix A (Engineering) ( ) for more detailed information on the project area’s hydrology and hydraulics.

FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

If no action is taken, turbid water quality conditions will continue due to the ongoing erosion during overtopping events.

## 2.9 AIR QUALITY

### EXISTING CONDITIONS

The Clean Air Act of 1972, as amended, (CAA) requires Federal actions to conform to an approved state implementation plan designed to achieve or maintain an attainment designation for air pollutants as defined by the National Ambient Air Quality Standard (NAAQS). The NAAQS were designed to protect public health and welfare. The criteria pollutants include carbon monoxide (CO), ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), and lead (Pb). The General Conformity Rule (40 CFR Parts 51 and 93) implements these requirements for actions occurring in air quality nonattainment areas.

The project area is located in the Air Quality Control Region (AQCR) known as Florida AQCR (40 CFR 81.310). The project area is in attainment for all the NAAQS.

### FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

Air quality conditions will remain the same if no action is taken.

## 2.10 NOISE

### EXISTING CONDITIONS

Noise is defined as unwanted sound and, in the context of protecting public health and welfare, implies potential effects on the human and natural environment. Noise is a significant concern associated with construction. Ambient noise levels within a given region may fluctuate over time because of variations in the intensity and abundance of noise sources. The project is located in an urban area, which consists of high noise levels. Natural sources of ambient noise include weather, e.g. rain and thunder, and wildlife. Anthropogenic noise could include commercial and residential vehicles and sounds from activities occurring in and around the project vicinity.

### FUTURE WITHOUT- PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

Noise levels in the project area will remain the same if no action is taken.

## 2.11 CULTURAL RESOURCES

### EXISTING CONDITIONS

Settlers from Spain founded the City of St. Augustine in 1565, making it the oldest continuously-occupied European city in the continental United States. The city served as the capital of the Spanish and British governments in Florida, as well as the capital of Florida when it was a United States Territory. Though originally constructed as the headquarters for Franciscan missionary efforts across the southeast, St. Francis Barracks subsequently was used by both the Spanish and British military. Other than a short period at the turn of the twentieth century, the Florida National Guard has been headquartered at St. Francis Barracks since 1821.

The area of potential effects (APE) (**Figure 2-12**) for the recommended plan includes the work zone along the seawall for direct physical effects and a 100-foot buffer for assessing potential visual effects. A review of the Florida Master Site File (FMSF), National Register of Historic Places (NRHP) database, and work conducted by the City of St. Augustine and the University of Florida was conducted to identify cultural resources within the APE. A cultural resources survey and evaluation of NRHP eligibility of cultural resources within this APE has not been completed.

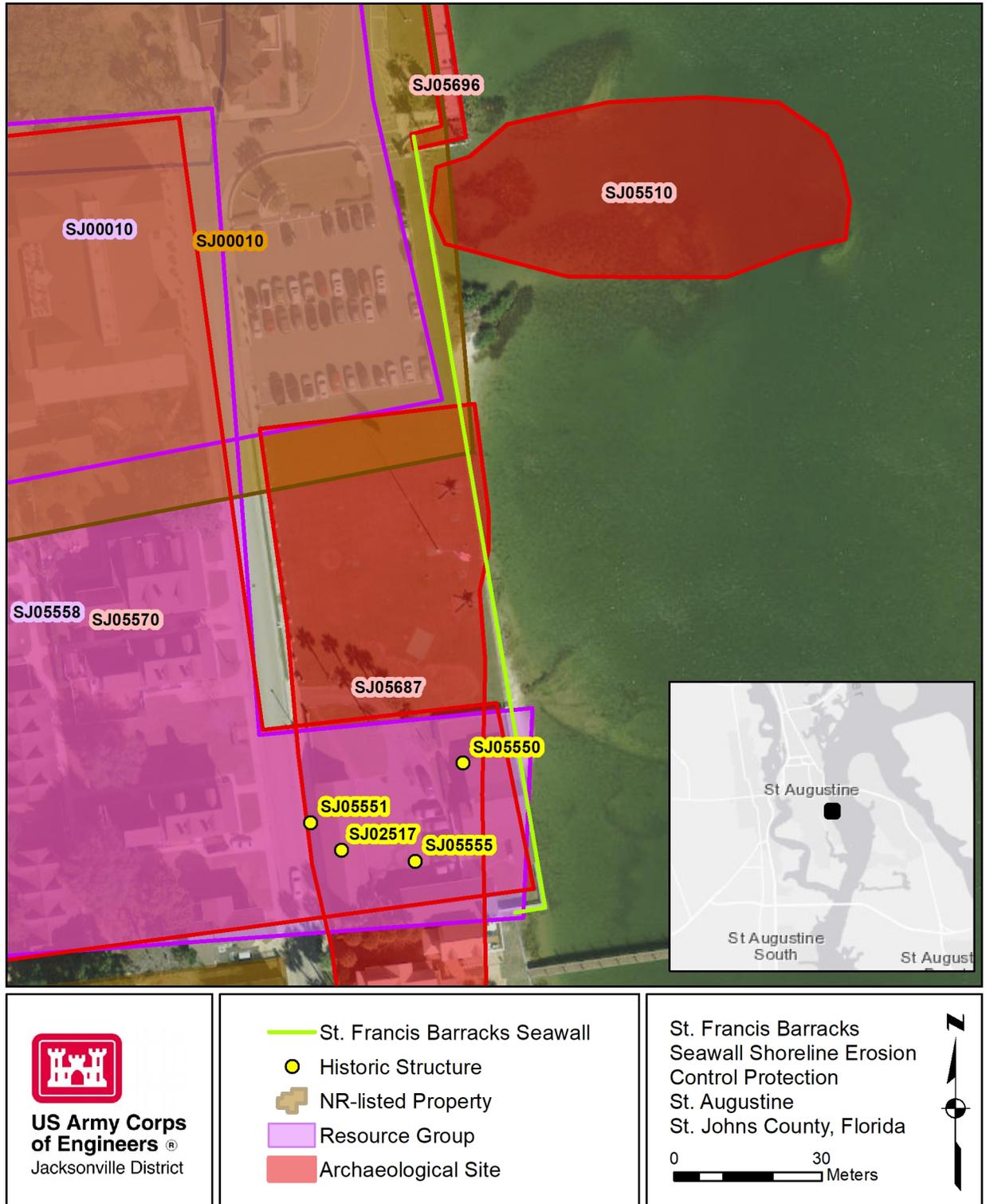


Figure 2-12: Previously-recorded resources listed in, or potentially eligible for listing in, the National Register of Historic Places.

The City of St. Augustine began organized historic preservation and inventory efforts in the 1930s. St. Augustine has been a Certified Local Government (CLG) since 1986. As a CLG, the city oversees work within the historic preservation zones, operates the St. Augustine Archaeology Program and Historic Preservation Office, and maintains a Historic Architecture Review Board. The research within the city has led to the recording of thousands of cultural resources within St. Augustine. Many of these resources overlap, with standing historic structures on top of archaeological sites within historic districts. Imprecision in the decades of recording resources has also led to multiple entries of the same structure as different file numbers, overlapping archaeological sites, and boundaries recommended in documents not adopted in the FMSF or NRHP databases.

The St. Augustine Town Plan Historic District (8SJ00010) is a National Historic Landmark (NHL) District encompassing the colonial footprint of the city. It was listed in the NRHP in 1970 with updates in 1986 and 2014. The 1986 NRHP nomination is the basis for the NHL district. In this document, the southern border of the NHL district is approximately 220 feet south of St. Francis Street. This includes the northern portion of the Recommended Plan. The NRHP form was updated in 2014, expanding the NRHP District boundaries (but not the NHL District) to include the area of the recommended plan.

King's Bakery, recorded as 8SJ02517 and 8SJ05551, is the only recorded standing structure in St. Augustine built during the British Colonial Period. The site file forms indicate that the Florida State Historic Preservation Officer (SHPO) has evaluated the structure as eligible for listing in the NRHP as 8SJ05551. The structure is included on the map accompanying the 1986 NRHP nomination form as a contributing element to the National Register District.

The two other historic structures within the project parcel are Building 8: St. Francis Barracks (8SJ05550) and Building 16: St. Francis Barracks (8SJ05555). The Alfred W. Sanchez House (8SJ01284) is within the visual APE south of the seawall. SHPO determined Building 8 and Building 16 are eligible for listing in the NRHP. The SHPO has not made a determination regarding the Alfred W. Sanchez House.

The APE for direct effects around the seawall has two overlapping terrestrial archaeological sites; 8SJ05570 and 8SJ05687. A limited single 50-x-70 centimeter test excavation has occurred on the parcel (Halbirt 2005) documenting multiple cultural strata. The northern portion of the parcel, beneath the parking lot, is not recorded as an archaeological site within the FMSF, though this portion falls within the National Historic Landmark District. Additional archaeological deposits associated with the seawall are recorded as sites 8SJ00010A, 8SJ00010B, 8SJ04971, and 8SJ05696.

The description of 8SJ00010A by John Goggin on a University of Florida site inventory card is "along sea wall in front of St. Francis Barracks." This card, from 1953, describes historic artifacts along the wall in the general area of the APE. The archaeological site 8SJ00010B was also recorded by Goggin as the "beach in front of seawall, south of the bridge." The forms indicate both sites included artifacts from the Spanish Colonial period. SHPO has not made a determination of NRHP eligibility for 8SJ00010A or 8SJ00010B.

The seawall, completed by USACE in 1842, is recorded as sites 8SJ04971 and 8SJ05696. The site boundaries in the FMSF stop at the parcel boundary for St. Francis Barracks. The Federal Emergency Management Agency (FEMA) determined the seawall to be eligible for inclusion in the NRHP, but did not include the portion of the seawall within the APE. The seawall within the current APE has not been recorded in the FMSF. No determination of NRHP eligibility has been made regarding this resource.

#### **St. Francis Barracks Seawall Shoreline Erosion Protection CAP Section 14**

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The historic boundary of St. Francis Barracks, excluding the parade ground and parking lot, is recorded as resource group 8SJ055570. SHPO found this resource eligible for inclusion in the NRHP as a building complex. Resource groups are how the Florida SHPO records districts, landscapes, building complexes, and linear features; in this case it is the associated individual resources associated with the barracks.

A single recorded submerged archaeological site is recorded within the APE for the Recommended Plan. The site 8SJ05510 is the remains of at least one pier in the water. Sastre (2005:14) reports a wharf was constructed in front of St. Francis Barracks between 1821 and 1832 out of pieces of the existing Spanish seawall. Archaeologists (URS 2011) documented 5 metal-clad wooden pilings and about 30 coquina blocks in the water. No determination of NRHP eligibility has been made regarding this resource.

FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

The ongoing erosion of sediment from the landward side of the seawall may disturb archaeological deposits. Failure of the seawall will directly affect the stability of Building 8. The further damage to the seawall would affect the St. Augustine Town Plan National Historic Landmark District.

## 2.12 NATIVE AMERICAN RESOURCES

EXISTING CONDITIONS

No portion of the proposed action is located within or adjacent to known Native American-owned lands, reservation lands, or Traditional Cultural Properties.

FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

No known Native American-owned lands, reservation lands, or Traditional Cultural Properties are present or would be threatened without project implementation.

## 2.13 SOCIOECONOMIC ENVIRONMENT

St. Francis Barracks is a historic structure constructed of coquina stone located on Marine Street in St. Augustine, Florida, and named in honor of St. Francis of Assisi. The barracks were constructed between 1724 and 1755 by friars of the Order of St. Francis to replace a series of wooden buildings which had been destroyed by the ravages of the tropical climate and fires. The barracks were turned into a military structure by the British in 1763. The name St. Francis Barracks also came to be applied to the military reservation which developed around the barracks on the shore of the Matanzas River. Today, the St. Francis Barracks serve as the Florida State Arsenal and headquarters for the Florida National Guard and its two subordinate organizations, the Florida Army National Guard and the Florida Air National Guard. A portion of the area is also the site of the St. Augustine National Cemetery.

St. Augustine is located within St. Johns County, Florida. St. Augustine's estimated population was 14,243 as of the 2017 census. St. Augustine's population has steadily increased since the 2010 census. **Table 2-2** shows the growth in population year-to-year from 2010 to 2017. The cumulative population growth for that period is about 8.6%. The population density is 1510.05 people/mi<sup>2</sup> (583.03 people/km<sup>2</sup>), with a household density of 291.04 people/km<sup>2</sup> (753.81 people/mi<sup>2</sup>).

**Table 2-2: St. Augustine Population (2010 – 2017).**

Year	Population	Growth	Annual Growth Rate
2010	13,021	1,429	1.17%
2011	13,169	148	1.14%
2012	13,400	231	1.75%
2013	13,572	172	1.28%
2014	13,815	243	1.79%
2015	13,960	145	1.05%
2016	14,192	232	1.66%
2017	14,243	51	0.36%

Based on data from the American Community Survey, in 2017 there were 7,110 households in the city, with an average size of 2.2 persons per household. The homeowner vacancy rate was 2.5%, with a median rent of \$1023/month. The median house has 5 rooms and is valued at \$246,700. The median income for households in St. Augustine, Florida was \$45,884, while the mean household income is \$66,164.

The economy of St. Augustine is mainly based on the arts, entertainment, recreation, accommodation and food service, and management of companies and enterprises. The largest industries in St. Augustine are accommodations and food service (1,371), retail trade (888), and educational services (726).

**FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)**

Socioeconomic conditions in the project area would not be expected to be effected under the No Action Alternative. The population of St Augustine is expected to continue to grow. St. Augustine is located in one of the fastest growing counties in the U.S; St. Johns County is ranked as the 14<sup>th</sup> fastest growing county by the U.S. Census Bureau. However, under a future without-project condition, the historical preservation of the St. Francis Barracks would be lost to erosion. Today, the St. Francis Barracks serve as the Florida State Arsenal and headquarters for the Florida National Guard and its two subordinate organizations, the Florida Army National Guard and the Florida Air National Guard. A portion of the area is also the site of the St. Augustine National Cemetery. The facilities would need to be relocated if not protected from the effects of erosion.

**2.14 AESTHETIC AND RECREATIONAL RESOURCES**

**EXISTING CONDITIONS**

The project area is an urban environment and historic district. The character of the district is a result of not any one structure, building, or feature, but the combination. The city of St. Augustine has more than 50 tourist attractions and points of interest, many located within walking distance of one another in the downtown historic district. The Matanzas River is also a source of recreation and is used by commercial and recreational boaters. Although the FLNG facilities and seawall are not open to the public, the FLNG does use the parade grounds for various agency functions.

FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

Recreation in the project area will likely remain the same if no action is taken; however, aesthetics would be adversely affected if the erosion in the area causes failure of the seawall.

## 2.15 HUMAN HEALTH AND LIFE SAFETY

EXISTING CONDITIONS

As erosion of sediments landward of the seawall continues, the risk to human health and life safety increases due to the continued risk for potential structural failure and/or damages to the facilities, specifically the JAG building. To reduce risk to human health and life safety, the JAG building is no longer occupied. Operations have been temporarily relocated while repairs are being planned and implemented.

FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

If no action is taken, the FLNG may need to entirely abandon the JAG office operations at this location to protect human health and life safety as the building's structural stability becomes compromised.

# CHAPTER 3

## PLAN FORMULATION



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## 3 PLAN FORMULATION

### 3.1 PROBLEMS AND OPPORTUNITIES

A problem is an existing undesirable condition to be changed. An opportunity is a chance to create a future condition that is desirable. The purpose of this feasibility study is to develop an implementable and acceptable plan to address specific problems and opportunities in the study area.

The St. Francis Barracks section of the seawall has been overtopped many times in its history since construction was completed in 1846, generally during cases of extreme high tide combined with strong winds. When waves overtop the wall, the over-wash drains back out through the cracks in the wall, taking soil with it. Maintenance operations by the Florida National Guard have included backfilling of depressions along the seawall with soil in the area of the parade ground every three to five years. The seawall was most recently overtopped during Hurricane Matthew (October 2016), resulting in damage to the concrete pavement between the seawall and the JAG office building. A site visit after Hurricane Matthew identified multiple sections of earthen embankment that had collapsed behind the seawall, with matching gaps in the seawall.

The problem associated with the St. Francis Barracks seawall is the erosion causing damage to the cultural resources on site and leading to the questionable structural stability of the JAG building. A site visit conducted in December 2016 found substantial erosion concerns along the wall which threaten infrastructure within the St. Francis Barracks Resource Group. Five areas of concern were noted in particular, shown in **Figure 3-1** and **Figure 3-2**. Voids were noted at the five areas of concern on the landside that corresponded to large cracks in the seawall. See Appendix A (Engineering) for more details of the areas of concern.

There is an opportunity to reduce the erosion generated by extreme high tide events which will protect the cultural resources along the 500 feet of the St. Francis Barracks seawall.



Figure 3-1: Areas of concern along the southern half of the project vicinity (Dec 2016).

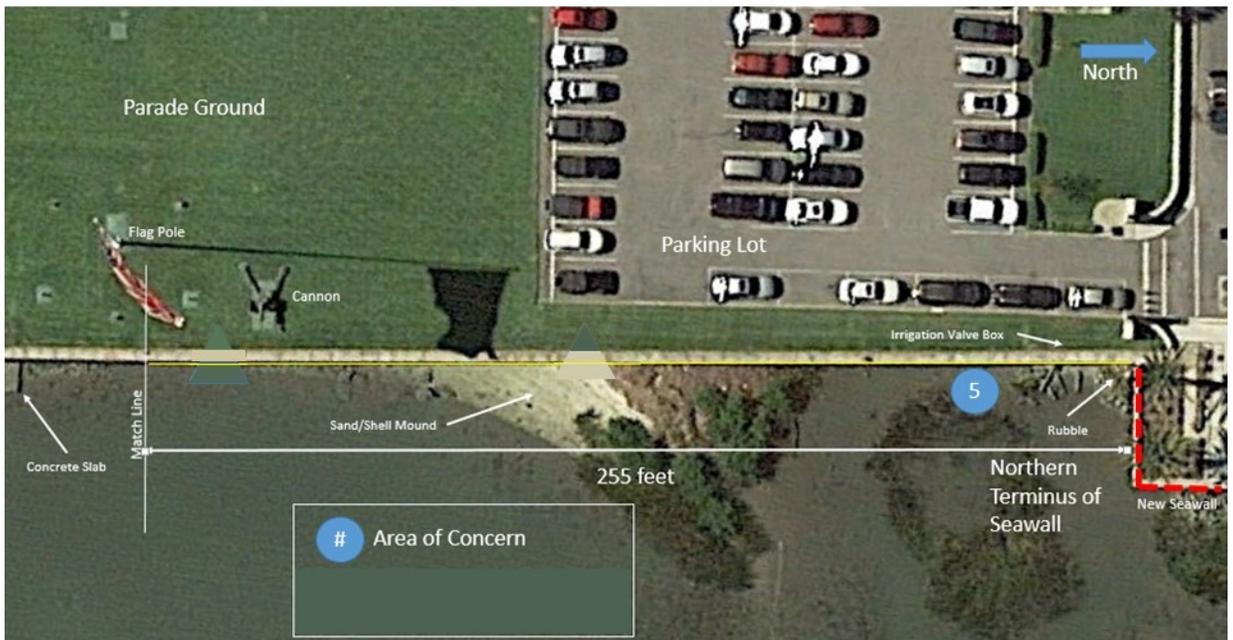


Figure 3-2: Areas of concern along the northern half of the project vicinity (Dec 2016).

## 3.2 PLANNING OBJECTIVES AND CONSTRAINTS\*

The Federal objective, as stated in the Principles and Guidelines, *see generally* ER 1105-2-100, is to contribute to national economic development (NED) consistent with protecting the Nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements.

USACE carefully considers and seeks to balance the environmental and development needs of the nation in full compliance with NEPA and other laws provided by Congress and the Executive Branch.

### **Project Objective:**

- Reduce damages to infrastructure from storm impacts, including waves, inundation, and erosion. Of these, erosion in the study area is of particular concern.

### **Project Constraints:**

A constraint limits the extent of the planning process. It is a statement of things or situations the alternative plans should avoid. Constraints are designed to avoid undesirable changes between the without and with-project future conditions. The planning constraints relative to this study are:

- The project must not negatively impact environmental and cultural resources in the area.

## 3.3 SCOPING AND ISSUES\*

This EA, integrated with the Feasibility Report, has been prepared pursuant to NEPA and its implementing regulations. The following issues were identified to be relevant to the proposed action and appropriate for detailed evaluation: vegetation, wetlands, T&E species, fish and other wildlife resources, Essential Fish Habitat (EFH), sediments, hazardous, toxic, and radioactive waste (HTRW), water quality, air quality, noise, cultural resources, Native American resources, socioeconomic resources, aesthetic resources, recreational resources, and human health and life safety. The existing conditions and future without-project conditions (Chapter 2), and the Recommended Plan (Chapter 5) were evaluated based on their effects on these issues. A summary of the effects of the other alternatives considered is included in **Table 3-2**.

A Notice of Availability for the draft IFR/EA and the proposed FONSI was coordinated with pertinent agencies and interested stakeholders for review and comment. All agency coordination letters are included in the Environmental Appendix D-1. A copy of the project's CWA Section 404(b)(1) Guidelines Evaluation is included in the Environmental Appendix D-2. Comments on the proposed FONSI and the draft IFR/EA are included in the Environmental Appendix D-3 of the final report, along with USACE responses to comments submitted during the review and comment period.

## 3.4 PLAN FORMULATION AND EVALUATION OF ALTERNATIVE PLANS

Preliminary plans were formulated by combining management measures. Each plan was formulated in consideration of the following 4 criteria described in the Principles and Guidelines:

- **Completeness:** The extent to which the plan provides and accounts for all necessary investments or

actions to ensure realization of the planning objectives, including actions by other Federal and non-Federal entities.

- Effectiveness: The extent to which the alternative plan contributes to achieving the planning objectives
- Efficiency: The extent to which an alternative plan is the most cost-effective means of achieving the objectives.
- Acceptability: The extent to which the alternative plans are acceptable in terms of applicable laws, regulations, and public policies.

### 3.5 PLAN FORMULATION RATIONALE\*

Step 3 of the Planning Process as described in ER 1105-2-100 is “Formulation of Alternative Plans.”

1. Alternative plans are formulated to identify ways of achieving planning objectives within the project constraints, in order to solve the problems and realize the opportunities listed in Step 1 of the Planning Process which is to “Specify Problems and Opportunities.”
2. Structural and non-structural management measures are identified and combined with other management measures to form alternative plans.
3. Planners will keep focus on complete plan(s) while doing individual tasks, to ensure their plans address the problems of the planning area.

In accordance with this policy, alternative plans were formulated for the St. Francis Barracks Seawall study and evaluated on the basis of providing emergency streambank protection per Section 14 of the 1946 Flood Control Act, as amended.

#### 3.5.1 MANAGEMENT MEASURES

Management measures are specific structural (S) or non-structural (NS) actions that would take place at geographical locations within the project area to address one or more planning objectives. Management measures are used to create plans and can be categorized as structural or non-structural.

Per ER 1105-2-100 Appendix F, Section III, F-23(d), alternatives are compared to determine the least cost alternative. The least cost alternative plan is considered to be justified if the total cost of the proposed alternative is less than the cost to relocate the threatened facilities. Therefore, relocation is not considered a “measure” or “alternative” but rather a basis for cost comparison.

- 1) NON-STRUCTURAL MANAGEMENT MEASURES (NS): The following non-structural management measures were identified to reduce damages to infrastructure from erosion for the St. Francis Barracks Seawall:

NS-1) No Action

\*Other measures that would be considered non-structural would typically be considered under “Relocation.” However, the cost to physically relocate the JAG facilities and the parade grounds as well as try to maintain the historical importance of the infrastructure would far outweigh the cost of construction to implement erosion control measures.

**2) STRUCTURAL MANAGEMENT MEASURES (S):** The following structural management measures were identified to meet the objective (as defined in Section 3.2) of reducing damages to infrastructure from erosion for the St. Francis Barracks Seawall.

Structural (S):

- S-1) Construct new wall at the same elevation
- S-2) Construct new wall at a higher elevation
- S-3) Install anchor rods through wall
  - a) Vertically
  - b) Horizontally
- S-4) Seal cracks in the wall
  - a) Spray entire wall with Shotcrete
  - b) Fill holes behind wall with flowable fill (or an equivalent granular, free-draining material)
  - c) Fill holes behind wall with soil
  - d) Fill holes with grout
- S-5) Sheetpile
  - a) Waterside
  - b) Landside
- S-6) Weepholes
- S-7) Revetment

### 3.5.2 SCREENING OF MANAGEMENT MEASURES

The planning objective previously discussed and sustainability criteria were used to screen the management measures. The no action measure (NS-1) and all the structural management measures (S-1, S-2, S-3, S-4, S-5, S-6, S-7) were carried forward to form the preliminary array of alternatives; see **Table 3-1**.

	Erosion control	Cost	Impacts to Archeological resources		
	<b>0-2</b> <b>0 = does not meet objective</b> <b>1 = partially meets objective</b> <b>2 = fully meets objective</b>	<b>0-2</b> <b>0 = most costly</b> <b>1 = in between costly</b> <b>2 = least costly</b>	<b>0-2</b> <b>0 = most impacts to Archeological resources</b> <b>1 = Partial impacts to Archeological resources</b> <b>2 = least impacts to Archeological resources</b>	Total	Measure carried forward? Y/N
NS-1 No Action	0	2	2	4	Y
S-1 Construct new wall @ same elevation	2	0	0	2	Y
S-2 Construct new wall @ higher elevation	2	0	0	2	Y
S-3 Install anchor rods through wall					
a) Vertically	0	1	1	2	Y
b) horizontally	0	1	1	2	Y
S-4 Seal cracks in the wall					
a) Spray entire wall with shotcrete	1	2	2	5	Y
b) fill holes behind wall with flowable fill	1	2	2	5	Y
c) fill holes behind wall with soil	0	2	2	4	Y
d) fill holes with grout	1	2	2	5	Y
S-5 Sheetpile					Y
a) waterside	2	0	1	3	Y
b) landside	2	0	1	3	Y
S-6 Weepholes	0	1	1	2	Y
S-7 Revetment	0	1	1	2	Y

**Table 3-1: Management Measure Screening Matrix**

### 3.5.3 PRELIMINARY ARRAY OF ALTERNATIVES

The affected seawall in this study is approximately 500 linear feet. Construction of adequate erosion control measures is possible within the current funding limits of the Continuing Authorities Program (CAP) Section 14 authority using the structural measures that were combined to form the following alternatives. Section 14 of the 1946 Flood Control Act, as amended, allows for Federal participation up to \$5,000,000.

- Alternative 1 - No Action
- Alternative 2 – S-2, S-4c, and S-6: Construct a new wall at a higher elevation with weepholes and fill the holes behind the wall with soil.
- Alternative 3 – S-2 and S-6: Construct a new wall at a higher elevation with weepholes.
- Alternative 4 – S-4b, S-4c, S-4d, and S-6: Spray the entire wall with shotcrete, fill the holes behind the wall with soil, fill holes with grout, and weepholes.
- Alternative 5 – S-1 and S-6: Construct new wall at the same elevation with weepholes.
- Alternative 6 – S-5a, S-5b, and S-6: Install sheetpile on the waterside and landside, and weepholes.
- Alternative 7 – S-4a, S-4b, S-4c, S-6: Spray entire wall with Shotcrete, fill holes behind wall with flowable fill (or an equivalent granular, free-draining material) with soil, and weepholes.
- Alternative 8 – S-3a, S-4c, and S-6: Insert rods vertically through existing coquina, fill holes behind wall with soil, and weepholes
- Alternative 9 – S-3b, S-4c, and S-6: Insert rods horizontally through existing coquina, fill holes behind wall with soil and weepholes.
- Alternative 10 – S-7, S-4a (limited amount), S-4b, S-4c, and S-6: Place revetment, fill holes behind wall with flowable fill (or an equivalent granular, free-draining material) with soil, place shotcrete at the damaged corner, and weepholes.

### EVALUATION OF MANAGEMENT MEASURES

The following evaluation criteria was used to rate each management measure on how it meets the project objectives:

- Erosion Protection;
- Relative Cost (level of construction scope); and
- Cultural Resources Impacts.

Each Management measure was scored a 0, 1, or 2 for each criterion, based on how well it meets each project objective criteria. Each Management measure scoring a total of 2 or more was therefore carried forward to be combined in to alternatives. To illustrate this process, the scoring rationale for Management Measure S-3 (install anchor rods through wall) is presented in **Table 3-2**.

**Table 3-2: Management Measure (MM) S-3 Scoring**

Evaluation Criteria	Score	Rationale
Erosion Protection	0	This MM only strengthens wall stability; it does not stop erosion as a stand-alone measure.
Relative Cost	1	Compared to the other MMs, the construction cost is approximately mid-range.
Cultural Resource Impacts	1	This will have some impacts to CRs, as it would require drilling into the wall.
Total Score	2	

The management measures were then combined in different permutations, resulting in ten unique management measure combinations, or alternatives as laid out above. The sum of each alternatives' management measure scores was calculated for comparison. There was a clear break between the total scores, the alternatives that scored a total of 13 points or more were carried forward for further evaluation, the next highest score was an 8. Due to the intent of CAP Section 14, hydraulic modeling, geotechnical and structural analyses, and cost estimates for each alternative were not performed, but instead were replaced with a qualitative analysis of the alternatives.

### 3.5.4 EVALUATION OF ALTERNATIVES

The preliminary alternatives were evaluated on their ability to meet the study objectives and not violate study constraints; however, due to the intent of CAP Section 14, a qualitative analysis based on construction costs, erosion protection and impacts to cultural resources was used as a screening criteria. The alternatives that scored a total of 13 points from the management measure score tallies were carried forward to the final array as well as the no action alternative: Alternative 1, Alternative 4, Alternative 7, and Alternative 10. The no action alternative is not recommended because continuing storm events will increase erosion and associated risk to the adjacent buildings. However, the no action alternative is carried forward for comparison purposes. Alternatives 4, 7, and 10 were discussed with the NFS and it was determined that Alternative 10 would be the Recommended Plan as it is the most complete, efficient, effective, and acceptable plan. Alternatives 4 and 7 included the spraying of shotcrete along the entirety of the wall and were therefore screened out because of the desire to maintain the historic character of the seawall. While all three of the Alternatives are complete, efficient and effective, Alternative 10 was the most acceptable with regards to laws, regulations and public policies with the project being in a National Historic Landmark District as well as the wall being a cultural resource itself. Alternative 10 was therefore carried forward for volume and cost estimate calculations.

### 3.5.5 ENVIRONMENTAL EFFECTS ASSOCIATED WITH THE ALTERNATIVE PLANS

**Table 3-3** summarizes the environmental effects associated with each of the alternative plans. Refer to Section 5 (Effects of the Recommended Plan) for a more detailed discussion on the Recommended Plan's effects.

**Table 3-3: Summary of the environmental effects associated with the alternative plans.**

Environmental Resource/ Factor	ALTERNATIVE 1: No Action	ALTERNATIVE 4: Shotcrete the entire wall, fill the holes behind the wall with soil, fill wall holes with grout, and add weepholes.	ALTERNATIVE 7: Shotcrete the entire wall, fill the holes behind the wall with flowable fill (or an equivalent granular, free-draining material), fill holes behind wall with soil and add weepholes.	ALTERNATIVE 10: (RECOMMENDED PLAN) Place revetment, fill the holes behind wall with flowable fill (or an equivalent granular, free-draining material), fill the holes behind the wall with soil, Shotcrete the damaged corner, and add weepholes.
<b>Vegetation and Wetlands</b>	Continued loss of habitat for upland grasses (landward and adjacent to the seawall). No effect to wetlands.	Prevention of erosion will protect habitat for upland grasses (landward and adjacent to the seawall). No effect to wetlands.	Same as Alternative 4.	Same as Alternative 4.
<b>T&amp;E Species</b>	No effect.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
<b>Fish and Other Wildlife Species</b>	No effect.	Construction activities may affect birds and other wildlife foraging or resting in the area. Dewatering activities for installation of shotcrete may temporarily affect fish. These effects are expected to be temporary and minor as there is suitable habitat nearby for displaced species.	Same as Alternative 4.	Same as Alternative 4. Revetment construction would lethally affect infaunal resources within the revetment footprint; however, recolonization of the rock by nearby communities is expected to occur quickly.

Environmental Resource/ Factor	<b>ALTERNATIVE 1: No Action</b>	<b>ALTERNATIVE 4: Shotcrete the entire wall, fill the holes behind the wall with soil, fill wall holes with grout, and add weepholes.</b>	<b>ALTERNATIVE 7: Shotcrete the entire wall, fill the holes behind the wall with flowable fill (or an equivalent granular, free-draining material), fill holes behind wall with soil and add weepholes.</b>	<b>ALTERNATIVE 10: (RECOMMENDED PLAN) Place revetment, fill the holes behind wall with flowable fill (or an equivalent granular, free-draining material), fill the holes behind the wall with soil, Shotcrete the damaged corner, and add weepholes.</b>
<b>EFH</b>	No effect.	Same as Alternative 1.	Same as Alternative 1.	Construction of the revetment would convert unconsolidated sediments to rock at the southeast corner of the seawall, extending out for a maximum radius of 25 feet. Conversion from unconsolidated sediments to rock would have minimal adverse effects on EFH and no adverse effects on federally managed fish species.
<b>Sediments</b>	Continued loss of sediments landward of the seawall would occur during overtopping events.	Prevention of erosion of sediments landward of the seawall.	Same as Alternative 4.	Same as Alternative 4.
<b>HTRW</b>	No effect.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

CHAPTER 3: PLAN FORMULATION

Environmental Resource/ Factor	<b>ALTERNATIVE 1: No Action</b>	<b>ALTERNATIVE 4: Shotcrete the entire wall, fill the holes behind the wall with soil, fill wall holes with grout, and add weepholes.</b>	<b>ALTERNATIVE 7: Shotcrete the entire wall, fill the holes behind the wall with flowable fill (or an equivalent granular, free- draining material), fill holes behind wall with soil and add weepholes.</b>	<b>ALTERNATIVE 10: (RECOMMENDED PLAN) Place revetment, fill the holes behind wall with flowable fill (or an equivalent granular, free- draining material), fill the holes behind the wall with soil, Shotcrete the damaged corner, and add weepholes.</b>
<b>Water Quality</b>	Continued degradation of water quality due to increased turbidity as sediments landward of the seawall are eroded.	Improved water quality due to the prevention of erosion of sediments landward of the seawall.	Same as Alternative 4.	Same as Alternative 4.
<b>Air Quality</b>	No effect.	Temporary and minor degradation of air quality during construction. This effect would cease with completion of construction.	Same as Alternative 4.	Same as Alternative 4.
<b>Noise</b>	No effect.	Temporary and minor increase in noise during construction. This effect would cease with the completion of construction.	Same as Alternative 4.	Same as Alternative 4.

CHAPTER 3: PLAN FORMULATION

Environmental Resource/ Factor	<b>ALTERNATIVE 1: No Action</b>	<b>ALTERNATIVE 4: Shotcrete the entire wall, fill the holes behind the wall with soil, fill wall holes with grout, and add weepholes.</b>	<b>ALTERNATIVE 7: Shotcrete the entire wall, fill the holes behind the wall with flowable fill (or an equivalent granular, free- draining material), fill holes behind wall with soil and add weepholes.</b>	<b>ALTERNATIVE 10: (RECOMMENDED PLAN) Place revetment, fill the holes behind wall with flowable fill (or an equivalent granular, free- draining material), fill the holes behind the wall with soil, Shotcrete the damaged corner, and add weepholes.</b>
<b>Cultural Resources</b>	Continued erosion may disturb archeological deposits. Failure of seawall will directly affect the stability of Building 8 (JAG office).	The USACE has determined that Alternative 4 may have an adverse effect on cultural resources potentially eligible for inclusion in the NRHP. A cultural resources assessment is necessary to identify and evaluate cultural resources and determine effects of the Recommended Plan on historic properties. The USACE is executing a Programmatic Agreement with SHPO to outline the process in which the USACE will consult with SHPO to avoid, minimize, and mitigate adverse effects of this Alternative to historic resources.	Same as Alternative 4.	Same as Alternative 4.

CHAPTER 3: PLAN FORMULATION

Environmental Resource/ Factor	<b>ALTERNATIVE 1: No Action</b>	<b>ALTERNATIVE 4: Shotcrete the entire wall, fill the holes behind the wall with soil, fill wall holes with grout, and add weepholes.</b>	<b>ALTERNATIVE 7: Shotcrete the entire wall, fill the holes behind the wall with flowable fill (or an equivalent granular, free- draining material), fill holes behind wall with soil and add weepholes.</b>	<b>ALTERNATIVE 10: (RECOMMENDED PLAN) Place revetment, fill the holes behind wall with flowable fill (or an equivalent granular, free- draining material), fill the holes behind the wall with soil, Shotcrete the damaged corner, and add weepholes.</b>
<b>Native American Resources</b>	No effect to Native American Resources.	It is anticipated that the Recommended Plan will have no effect on Native Americans. Consultation with the Seminole Tribe of Florida, the Seminole Nation of Oklahoma, Thlopthlocco Tribal Town, and the Miccosukee Tribe of Indians of Florida was initiated by letter on April 15, 2019.	Same as Alternative 4.	Same as Alternative 4.
<b>Socioeconomic Resources</b>	No effect.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

<p><b>Aesthetic and Recreational Resources</b></p>	<p>No effect to recreation in the project area.</p> <p>Aesthetics would be adversely affected if the ongoing erosion causes failure of the seawall.</p>	<p>Temporary presence of heavy equipment used during construction may be considered “unsightly” by members of the public. Installation of shotcrete would result in a permanent change to the seawall’s aesthetics, which may be more noticeable at low tide than at high tide. Construction activities may temporarily impede the FLNG’s use of the areas immediately surrounding the seawall as construction is ongoing. Implementation of the Recommended Plan will have no effect on recreation following the completion of construction.</p>	<p>Same as Alternative 4.</p>	<p>Temporary presence of heavy equipment used during construction may be considered “unsightly” by members of the public. Installation of shotcrete and the revetment would result in a permanent change to the project site’s southeast corner aesthetics, which may be more noticeable at low tide than at high tide. Construction activities may temporarily impede the FLNG’s recreational use of the areas immediately surrounding the seawall as construction is ongoing. Implementation of the Recommended Plan will have no effect on recreation following the completion of construction.</p>
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<p><b>Human Health And Life Safety</b></p>	<p>Continued erosion increases the risk that the seawall will fail, which increases the risk to the JAG building’s structural integrity, and ultimately, to human health and life safety.</p>	<p>Repairs and improvements will re-stabilize the seawall and minimize erosion, reducing the risk to human health and life safety.</p>	<p>Same as Alternative 4.</p>	<p>Same as Alternative 4.  Additionally, revetment will serve as a wave break, which will decrease the wave-induced erosion to the seawall’s southeast corner.</p>
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### 3.5.6 PLAN SELECTION

The most cost effective alternative with the least impacts to cultural resources is Alternative 10, which consists of the installation of weepholes spaced approximately every 10 feet. Each weephole will include a gravel drainage. Grout will be used to fill the large voids on the waterside in order to prevent the flowable fill (or an equivalent granular, free-draining material) from discharging into the Intracoastal Waterway (ICW). Flowable fill (or an equivalent granular, free-draining material) will be placed at the voids from the ground surface, and allowed to flow into the voids beneath. The broken concrete sidewalk at the JAG building extending between the building to the seawall will be removed for easier access to the voids beneath the building. In order to ensure the existing soil loading conditions on the landside of the wall are maintained, only minimal localized excavation of soil from the landside of the wall is planned, to gain better access to the voids. Flowable fill (or an equivalent granular, free-draining material) will be placed at the five main areas of erosion concern where large voids exist. Topsoil and sod will be placed on top of flowable fill (or an equivalent granular, free-draining material) in order to maintain the original appearance and the concrete sidewalk in front of the JAG building will be replaced. Shotcrete will be applied on the waterside of the south corner in order to add additional erosion control. In order to ensure that the shotcrete remains in place, an anchoring frame will be connected to the wall. Lastly, stone revetment will be placed at the corner in order to provide a wave break to reduce any wave-induced erosion to the structure. The stone revetment will have a maximum radius of 25 feet from the corner and the adjacent damaged wall sections. Based on the wave climate in this area, the appropriate stone size to handle waves generated during a 100-year flood surge is granite stone with a diameter of 2.5 feet. The design includes only one layer of stone against the wall.

## 3.6 ECONOMIC JUSTIFICATION

The project first cost for the Recommended Plan is \$1,024,000 at FY19 price levels; including contingency, detailed design, and construction management costs. The Federal costs of the Recommended Plan will be \$665,600 and the non-Federal costs \$358,400 at a 65% Federal and 35% non-Federal cost share. The expected construction duration is approximately 4 months.

Per ER 1105-2-100 Appendix F, Section III, F-23(d), the least cost alternative plan is considered to be justified if the total costs of the proposed alternative are less than the costs to relocate the threatened facility. The project is within a National Historic Landmark, the highest level of significance that a historic property can be designated by the Department of Interior. These represent the most important historic locations in the country. All of the structures on the parcel protected by the seawall are recorded resources, either listed on the Nation Register of Historic Places or recorded as eligible for listing. The buildings are part of the historic resource group comprised of St. Francis Barracks. Simply removing the historic facilities from the affected area and allowing erosion to continue is an unacceptable alternative. Continued erosion will further affect the National Landmark of the City of St. Augustine. The structures behind the seawall include King's Bakery, the only structure in St. Augustine dating to the British Colonial Period. Since 1763, the area served as a military facility for operations during the British, Second Spanish, Territorial, and Statehood periods. Relocation of the facilities; which include the JAG building and the parade grounds; would not maintain the historic significance with the centuries of military activity.

In addition, the City of St. Augustine asserts the maintenance of the historic character as key to the economic life of the city (Historic Preservation Master Plan 2018). The city reports tourism brought in over a billion dollars in 2016 and links this directly to Heritage Tourism. They report 96% of all of the

visitors to the county walk through St. Augustine's Historic District, which includes the project area. The character of the district is a result of not any one structure, building, or feature, but the combination. The direct benefit is not just to the Florida Army National Guard, but also to the National Historic Landmark District and City of St. Augustine.

The cost to physically relocate the JAG facilities and the parade grounds as well as try to maintain the historical importance of the infrastructure would far outweigh the cost of construction to implement erosion control measures. Therefore, construction of erosion control measures with the least cost alternative is the only acceptable course of action.

# CHAPTER 4

## THE

### RECOMMENDED

#### PLAN



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## 4 THE RECOMMENDED PLAN

### 4.1 GENERAL DESCRIPTION

The Recommended Plan (**Figure 4-1**), Alternative 10, consists of installation of weepholes spaced approximately every 10 feet. Each weephole will include gravel drainage. Grout will be used to fill the large voids on the waterside in order to prevent the flowable fill (or an equivalent granular, free-draining material) from discharging into the Intracoastal Waterway (ICW). Flowable fill (or an equivalent granular, free-draining material) will be placed at the voids from the ground surface and allowed to flow into the voids beneath. The broken concrete sidewalk at the JAG building extending between the building to the seawall will be removed for easier access to the voids beneath the building. In order to ensure the existing soil loading conditions on the landside of the wall are maintained, only minimal localized excavation of soil from the landside of the wall is planned to gain better access to the voids. Flowable fill (or an equivalent granular, free-draining material) will be placed at the five main areas of erosion concern where large voids exist as shown in. Topsoil and sod will be placed on top of flowable fill (or an equivalent granular, free-draining material) in order to maintain the original appearance and the concrete sidewalk in front of the JAG building will be replaced. Shotcrete will be applied on the waterside of the south corner in order to add additional erosion control. In order to ensure that the shotcrete remains in place, an anchoring frame will be connected to the wall. Lastly, stone revetment will be placed at the corner in order to provide a wave break to reduce any wave-induced erosion to the structure. The stone revetment will have a maximum radius of 25 feet from the corner and the adjacent damaged wall sections. Based on the wave climate in this area, the appropriate stone size to handle waves generated during a 100-year flood elevation is granite stone with a diameter of 2.5 feet. The design includes only one layer of stone against the wall.



**Figure 4-1: The Recommended Plan**

## 4.2 DESIGN AND CONSTRUCTION CONSIDERATIONS

### 4.2.1 ENGINEERING ANALYSIS

Engineering analysis and documentation is presented in the Engineering Appendix, Appendix A.

### 4.2.2 PLAN IMPLEMENTATION REQUIREMENTS

The valuation of lands, easements, rights-of-way, relocations, and disposal areas (LERRDs) for crediting purposes for a Section 14 project is the same as for any other project, except when the lands, easements, or rights-of-way are part of the tract of land that includes the facility or structure being protected. In such cases, the non-Federal sponsor will not receive credit for the value of LERRD it provides that are part of the tract of land on which the facility or structure to be protected is located, if such tract of land is owned by either the non-Federal sponsor or the owner of the facility or structure on the date that the PCA is executed. ER 1105-2-100 (January 31, 2007).

#### NON-FEDERAL RESPONSIBILITIES

The following summarizes some of the key non-Federal project sponsor responsibilities. The non-Federal project sponsor shall provide all LERRDs necessary for initial construction and maintenance of the project. The non-Federal project sponsor shall provide contributions which shall equal 35 percent of the project costs, plus any amount that exceeds \$5,000,000. The Federal expenditure limit for Section 14 projects is \$5,000,000. The non-Federal project sponsor's total contribution cost is estimated at \$358,400.

The non-Federal project sponsor shall enter into a Project Partnership Agreement (PPA) with the Federal Government. In accordance with the terms of the PPA, the non-Federal sponsor must provide all LERRDs required for the project and perform necessary non-Federal audits and investigations necessary to identify the existence and extent of hazardous substances on lands, easements, and rights-of-way required for the project, and shall assume full financial responsibility for all necessary cleanup and response costs of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulated materials.

#### FEDERAL RESPONSIBILITIES

USACE is responsible for budgeting for the Federal share of construction costs. Federal funding is subject to budgetary constraints inherent in the formation of the national civil works budget for a given fiscal year. The Federal share of the work is limited to \$5,000,000 under Section 14 of the Flood Control Act of 1946, as amended. USACE would obtain all necessary authorizations and construct the project.

#### WORK-IN-KIND

Work-in-kind is defined as integral work contributed by the non-Federal sponsor toward implementation of a project, in lieu of payment of a portion of the sponsor's cash contributions toward implementation of the project. In some cases, completed work-in-kind may be credited by USACE to the non-Federal sponsor, resulting in a reduction of their cash contribution on behalf of the project. At this time there is no identified work-in-kind for this project.

### SPONSOR'S VIEWS

The non-Federal sponsor fully supports the Recommended Plan. (See letter dated August 13, 2018 in Pertinent Correspondence Appendix (E)). The non-Federal sponsor supports the Recommended Plan to utilize flowable fill (or an equivalent granular, free-draining material), grout, shotcrete, and revetment at the damaged corner to prevent continued erosion

### REAL ESTATE REQUIREMENTS

Construction is proposed to take place primarily from the land with some construction occurring from water (**please refer to Figure 4-1**). The non-Federal sponsor will acquire the lands via a temporary work area easement. The non-Federal sponsor will certify that lands are available for construction and repair of the seawall. A staging area consisting of one parking lot has been identified and the non-Federal sponsor will certify availability. Access will be provided via public access roads. Access to the staging area will not require exclusive use of the identified access route. The project seawall will require a temporary work area easement from property owners. Construction is estimated to take approximately 4 months. No borrow or disposal areas are required for the construction of subject project.

### WATER QUALITY CERTIFICATION AND COASTAL ZONE MANAGEMENT ACT (CZMA) COMPLIANCE\*

Construction of the project's revetment is considered fill into the waters of the United States. In compliance with the Clean Water Act of 1972, as amended, (CWA), a Section 404(b)(1) Guidelines evaluation has been completed and is included in the Environmental Appendix D-2. The project will meet the state of Florida's water quality standards. Any applicable authorizations will be obtained prior to the start of construction. The project will implement and meet all conditions imposed by the necessary authorizations in order to minimize adverse impacts to water quality. Pursuant to the Coastal Zone Management Act (CZMA), a Federal Consistency Determination (FCD) was submitted to the state of Florida for review and concurrence. USACE determined that the Recommended Plan is consistent with the state's Coastal Zone Management Program and anticipates receiving concurrence. USACE will comply with CZMA and will implement any applicable conditions. Pertinent correspondence is found in the Environmental Appendix D-1.

### DETAILED COST ESTIMATE AND COST APPORTIONMENT

The total project first cost to construct the project is \$1,024,000 (FY19 price level). This estimate includes contingency, detailed design, and construction management costs in accordance with Engineer Pamphlet 500-1-1 and Engineer Regulation 500-1-1. The estimated cost presented in this report (**Table 4-1**), is at the FY19 price level. Cost estimate details are included in the Cost Appendix (B).

Projects implemented under this authority have the same cost sharing requirements as structural flood damage reduction projects implemented under specific congressional authorization. The non-Federal sponsor is responsible for a minimum of 35 percent of total project costs to a maximum of 50 percent of total project costs during the design and implementation period. The non-Federal sponsor must pay 5 percent of total project costs in cash, provide all LERRDs required for the project, and perform necessary non-Federal audits and investigations as necessary to identify the existence and extent of hazardous substances on LERRDs required for the project. If the value of the non-Federal sponsor's contributions listed above is less than 35 percent of total project costs, the non-Federal sponsor must pay

additional cash so that its contributions equal 35 percent of total project costs. Operation maintenance, repair, rehabilitation, and replacement is a 100% non-Federal responsibility. The Federal costs of the Recommended Plan will be \$665,600 and the non-Federal costs \$358,400. **Table 4-2** presents the cost allocation of the Recommended Plan. The expected construction duration is 4 months.

**Table 4-1: Total project cost of the Recommended Plan**

<b>Total Project First Cost (FY19) Price Levels</b>		
<b>WBS</b>	<b>Project Feature</b>	<b>Total Cost \$</b>
10	Breakwaters & Seawalls	\$455,000
1	Lands and damages <sup>1</sup>	\$25,000
30	Planning Engineering and Design	\$463,000
31	Construction Management	\$80,000
	<b>Total Project Cost<sup>2</sup></b>	<b>\$1,024,000</b>
1. Lands and damages include temporary easement acquisition for staging area.		
2. Including contingency, detailed design and construction management costs		

**Table 4-2: Cost Allocation of the Recommended Plan**

<b>Cost Allocation of the Recommended Plan</b>		
<b>Total Project Cost</b>	<b>Federal Maximum 65%</b>	<b>Non-Federal Minimum 35%</b>
<b>\$1,024,000</b>	\$665,600	\$358,400
<b>Cost Sharing</b>	<b>Federal</b>	<b>Non-Federal</b>
Non-Federal LERRD		\$10,000
Additional Non-Federal cash requirement		\$348,400
<b>Non-Federal Minimum 35%</b>		<b>\$358,400</b>
Federal cost	<b>\$665,600</b>	
<b>Total Cost Allocation</b>	<b>\$665,600</b>	<b>\$358,400</b>

### 4.3 RESIDUAL RISK

Even with implementation of the Recommended Plan, residual risk remains. The Recommended Plan addresses the current soil-loss conditions caused by runoff and wave overwash drainage through large cracks in the seawall as experienced with frequent heavy rains and storm conditions (the 100-year storm surge with sustained 150-mph winds). It is not designed to prevent soil erosion resulting from exacerbated overwash and wave impacts caused by extreme high storm/hurricane events. Residual risk remains that extreme high storm events in the future could excessively overtop and impact the seawall, causing further erosion and damaging the facilities. Ultimately, extreme high storm events could cause the structural stability of the historic JAG building to fail, which the Recommended Plan is not designed to address.

### 4.4 SEA LEVEL CHANGE CONSIDERATIONS

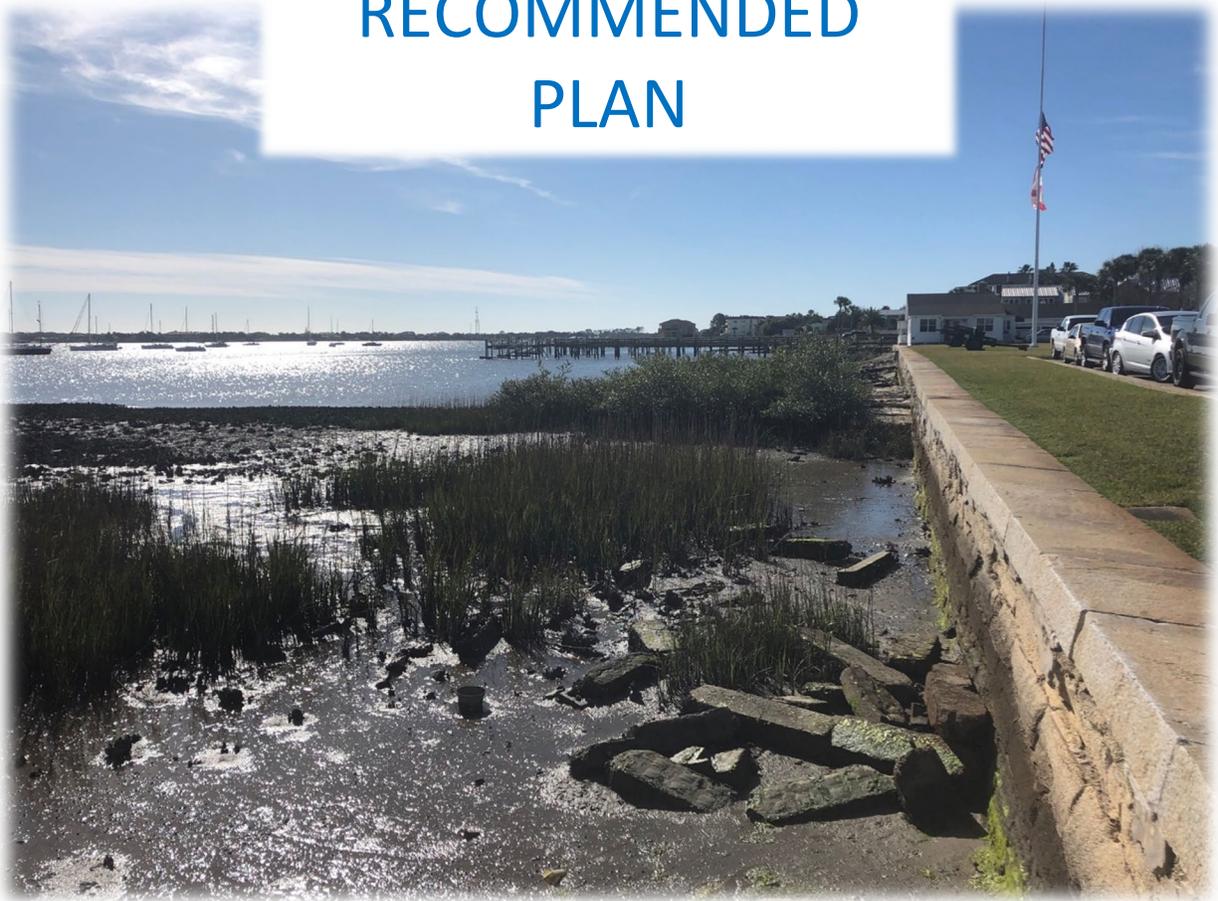
ER 1100-2-8162, *Incorporating Sea Level Change (SLC) in Civil Works Programs*, provides regulations and guidance for incorporating direct and indirect physical effects of projected future sea level change to USACE Civil Works projects. These regulations apply to all USACE Civil Works activities and projects, both existing and proposed, across the project life cycle in managing, planning, engineering, designing, constructing, operating, and maintaining USACE projects and systems of projects.

The USACE climate change policy document, *USACE Climate Preparedness and Resilience Policy Statement* (June 2014), requires consideration of climate change as well as a SLC analysis. This is required at every step in the project life cycle for all existing and planned USACE projects to reduce vulnerabilities and enhance the resilience of our water-resource infrastructure. The analysis, guidance for which is provided in Engineering And Construction Bulletin (ECB) No. 2016-25 (16 Sept 2016), *Guidance for Incorporating Climate Change Impacts to Inland Hydrology in Civil Works Studies, Designs, and Projects*, provides for consideration of specific climate change projections in the project area and potential impacts to the particular hydrologic analysis.

The analyses for the Recommended Plan projected an increased number of consecutive dry days, a slight temperature increase, and increased severity in large rainfall events. Adaptation of the design would include placing additional grout in future holes that open up, and placing fill in any additional voids that open up as a result of new holes in the wall. See Appendix A (Engineering) for detailed SLC and Climate Change analyses.

# CHAPTER 5

## EFFECTS OF THE RECOMMENDED PLAN



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## 5 EFFECTS OF THE RECOMMENDED PLAN\*

This chapter is the scientific and analytic evaluation of effects that would result from implementing the Recommended Plan. Chapter 2 includes the effects resulting from the “No Action Alternative,” or the “future without-project conditions.” The following section includes anticipated changes to the existing environment including direct, indirect, and cumulative effects as a result of the Recommended Plan, or the “future with-project conditions.”

The terms “impact” and “effect” may be used interchangeably in this chapter. Effects may be discussed as positive or negative and/or significant or minor, as appropriate to the condition or resource. Positive effects, or benefits, occur when an action results in a beneficial change to the resource, whereas negative effects occur when an action results in a detrimental change to the resource. Significant effects occur when an action substantially changes or affects the resource. A minor effect occurs when an action causes impact, but the resource is not substantially changed. Effects are also discussed as temporary, as well as short and long-term, and are associated with relative time frames as the direct result of the action. In this case, temporary refers to an effect only during the period of construction. Short-term describes the effect as continuing for 1-3 years post construction, whereas long-term describes effects that are permanent or would be expected to remain for many years. This chapter is organized by resource area following the same sequence as in Chapter 2.

### 5.1 GENERAL ENVIRONMENTAL SETTING

Implementation of the Recommended Plan will result in the repair and improvement of the St. Francis Barracks seawall, which will minimize the erosion caused by overtopping events. No effect is anticipated to the project area’s climate, although minimal amounts of greenhouse gases (GHG) would be created during construction of the Recommended Plan. The release of GHG emissions will cease with completion of construction.

### 5.2 VEGETATION AND WETLANDS

Repairs to the seawall will minimize erosion of sediments which will improve the habitat for upland grasses. In areas of excavation and installation of flowable fill (or an equivalent granular, free-draining material), topsoil and sod will be placed on top of flowable fill (or an equivalent granular, free-draining material) in order to restore and maintain the original appearance. The revetment will be constructed at the southeast corner of the seawall and will not affect wetlands.

### 5.3 THREATENED AND ENDANGERED (T&E) SPECIES

Pursuant to Section 7 of the Endangered Species Act (16 U.S.C. §1536) (ESA), USACE evaluated the potential effects to T&E species that may be affected by implementation of the Recommended Plan. (See Table 5-1 for the list of Federally T&E species potentially occurring in the project vicinity.)

**Table 5-1: Federally listed T&E species potentially occurring in the project vicinity.**

Common Name	Scientific Name	Listing Status
Florida manatee	<i>Trichechus manatus latirostris</i>	T
American alligator	<i>Alligator mississippiensis</i>	T <sup>1</sup>
Green sea turtle	<i>Chelonia mydas</i>	T <sup>2</sup>
Loggerhead sea turtle	<i>Caretta caretta</i>	T <sup>3</sup>
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	E
Smalltooth sawfish	<i>Pristis pectinata</i>	E
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E
Atlantic sturgeon	<i>Acipenser oxyrinchus oxyrinchus</i>	E

T = Threatened; E = Endangered; <sup>1</sup>Listing status due to similarity of appearance to another T&E species; <sup>2</sup>North Atlantic Distinct Population Segment (DPS); <sup>3</sup>Northwest Atlantic DPS

Florida manatees, American alligators, sea turtles, STSF, and sturgeon may occur in the project's vicinity for transit or foraging. These species are not likely to be near or using the project area during low tide as the seawall and proposed revetment footprint are exposed; however, the species may occur in the project area during high tide events. No effects to these species will occur from improvements to the seawall and/or construction activities taking place landward of the seawall. Dewatering activities and revetment construction will occur seaward of the seawall. However, no effects to the listed species are anticipated because these species are highly mobile and can easily move away from and avoid these types of construction activities. Additionally, to ensure the safety of manatees and/or sea turtles in the project area, the project will adhere to NMFS's Sea Turtle and Smalltooth Sawfish Construction Conditions (dated 2006) and USFWS's Standard Manatee Conditions for In-Water Work (2011) which provide additional protection by requiring in-water work to stop if a manatee or sea turtle is observed within 50 feet of operating machinery. Implementation of these standard protection measures may extend protection to other T&E species that may be in the area as well. When considering the project area's environmental factors, species' mobility, and the implementation of the NMFS and USFWS standard protection conditions, effects are considered extremely unlikely to occur, and the risk of adverse effects is therefore discountable. Based on this analysis, USACE determined the project would have no effect to the T&E species potentially occurring in the project vicinity. The ESA does not require consultation with USFWS and NMFS for no effect determinations; however, these agencies will be provided the opportunity to review the project during this draft EA's public and agency review period.

## 5.4 FISH AND OTHER WILDLIFE SPECIES

Implementation of the Recommended Plan may temporarily affect fish and wildlife foraging and/or resting in the project area. This effect would be temporary, ceasing with the completion of construction, and limited to the immediate area of construction activities. In addition, wildlife will be able to relocate during construction operations to avoid any physical impacts. Infaunal resources that live inside the boundaries of the revetment footprint will be lethally affected during the placement of rock revetment; however, colonization of the rock by neighboring communities is expected to occur quickly. Additionally, there is sufficient habitat in the area to be used by any species displaced by the construction of the revetment.

Migratory birds may pass through and use areas in, or adjacent to, the project area. There may be some interruption of foraging and resting activities for birds due to construction activities and/or

increased noise. This effect would be short-term and limited to the immediate area of construction activities. There is sufficient habitat to be used by displaced birds during construction. USACE developed a suite of contractual specifications for contractors to implement during construction where migratory birds may be present. The contractor will keep all construction activities under surveillance, management, and control to prevent effects to migratory birds. The contractor may be held responsible for harming or harassing the birds, their eggs, or their nests present in the site as a result of the construction activities.

## 5.5 ESSENTIAL FISH HABITAT (EFH)

Construction of the revetment will convert unconsolidated sediments to rock at the southeast corner of the seawall to act as a wave break and decrease the wave-induced erosion to the structure. The stone revetment will have a maximum radius of 25 feet from the corner to the north. The radius of the revetment tapers off to approximately 20 feet (moving west) to within one foot of the adjacent property to the south. Based on the wave climate in this area, the appropriate diameter of the stone was approximated at 2.5 feet and will include only one layer of stone against the wall. To maintain a uniform stone elevation, an additional layer of stone may be necessary towards the outside of the radius as the Matanzas River slopes downward. No HAPC will be affected by the implementation of the Recommended Plan and there is sufficient habitat in the area for species using the unconsolidated sediments; therefore, USACE has determined that the project would have minimal adverse effects on EFH and no adverse effects on federally managed fish species.

## 5.6 SEDIMENTS

Construction of the Recommended Plan will result in improvements to the project area's sediments by minimizing the ongoing erosion.

## 5.7 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)

The Recommended Plan will not change the project area's HTRW conditions.

## 5.8 WATER QUALITY

Repairs and improvements to the St. Francis Barracks seawall will occur from the landward side of the seawall. Installation of shotcrete at the southeast corner of the seawall will occur during low tide but may require dewatering in this specific area. Construction of the revetment will require the placement of rock to occur seaward of and adjacent to the seawall in the Matanzas River. Construction equipment may release negligible amounts of pollutants, including oils and grease; however, BMPs will be used to limit the possibility of negative effects. Detailed pollution control plans will be developed during the D&I phase. These temporary impacts would cease with completion of the construction. Implementation of the Recommended Plan will minimize erosion landward of the seawall thereby improving water quality.

## 5.9 AIR QUALITY

Minor, temporary degradation of air quality will occur due to emissions from construction activities; however, the impacts to air quality are anticipated to be localized and negligible, lasting only until construction is complete. The project will not construct any new sources of air pollution. The contractor will be required to comply with applicable state air pollution standards and Federal emission and performance laws and standards.

## 5.10 NOISE

The construction of the Recommended Plan will result in minor, short term, local increases in noise resulting from the use of heavy machinery. Construction crews would be required to comply with all applicable laws regarding noise, including any potential time of day restrictions and maximum decibel levels. All noise impacts associated with the Recommended Plan would cease with completion of construction.

## 5.11 CULTURAL RESOURCES

USACE has determined that repairs and improvements to the St. Francis Barracks seawall may have an adverse effect on cultural resources potentially eligible for inclusion in the NRHP. A cultural resources assessment is necessary to identify and evaluate such resources and determine the effects of the Recommended Plan on historic properties. USACE is pursuing a program alternative under 36 CFR § 800.14 for compliance with Section 106 of the NHPA, as amended (54U.S.C. § 306108 et seq.). The Programmatic Agreement will outline the process in which USACE will consult with SHPO, the National Park Service (NPS), the City of St. Augustine Historic Preservation Office, the Seminole Tribe of Florida, the Seminole Nation of Oklahoma, Thlopthlocco Tribal Town, the Miccosukee Tribe of Indians of Florida, and the Advisory Council on Historic Preservation (ACHP) to avoid, minimize, and mitigate adverse effects of the Recommended Plan to historic properties.

## 5.12 NATIVE AMERICAN RESOURCES

It is anticipated that the Recommended Plan will have no effect on Native Americans. Consultation with the Seminole Tribe of Florida, the Seminole Nation of Oklahoma, Thlopthlocco Tribal Town, and the Miccosukee Tribe of Indians of Florida was initiated by letter on April 15, 2019.

## 5.13 SOCIOECONOMIC ENVIRONMENT

St. Augustine is the nation's oldest city and also holds distinction for its historical preservation and tourist attractions. With this project, the St. Francis Barracks will retain its historical preservation and its modern day role as the headquarters of the Florida National Guard, the Florida Army National Guard, and the Florida Air National Guard.

## 5.14 AESTHETIC AND RECREATIONAL RESOURCES

The temporary presence of heavy equipment used during construction may be considered “unsightly” by members of the public. Installation of shotcrete and the revetment would result in a permanent change to the project site’s southeast corner aesthetics, which may be more noticeable at low tide than at high tide. Construction activities may temporarily impede the FLNG’s recreational use of the areas immediately surrounding the seawall as construction is ongoing. Implementation of the Recommended Plan will have no effect on recreation following the completion of construction.

## 5.15 HUMAN HEALTH AND LIFE SAFETY

Implementation of the Recommended Plan will re-stabilize the St. Francis Barracks seawall and minimize erosion, reducing risk to human health and life safety. Structures adjacent to the seawall will be protected from damages that could result in structural instability or failure.

## 5.16 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

### 5.16.1 IRREVERSIBLE

An irreversible commitment of resources is one in which the ability to use and/or enjoy the resource is lost forever. One example of an irreversible commitment would be the mining of a mineral resource. The energy and fuel used during construction would be an irreversible commitment of resources.

### 5.16.2 IRRETRIEVABLE

An irretrievable commitment of resources is one in which, due to decisions to manage the resource for another purpose, opportunities to use or enjoy the resource as they presently exist are lost for a period of time. An example of an irretrievable loss might be where a type of vegetation is lost due to road construction. Construction of the Recommended Plan will result in the loss of the existing vegetation at excavation sites; however, topsoil and sod will be placed on top of flowable fill (or an equivalent granular, free-draining material) in order to restore and maintain the original appearance.

## 5.17 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

Impacts from the construction activities to fish and wildlife, including T&E species, are expected to be insignificant and temporary as the mobile organisms are able to relocate to avoid direct physical effects. Infaunal resources that live inside the boundaries of the revetment footprint will be lethally affected during the placement of rock revetment; however, colonization of the rock by neighboring communities is expected to occur quickly. Additionally, there is sufficient habitat in the area to be used by any species displaced by the construction of the revetment. While construction of the Recommended Plan will impact the vegetation in excavation areas, topsoil and sod will be placed on top of flowable fill (or an equivalent granular, free-draining material) in order to restore and maintain the original appearance. Minor degradation of air quality and increases in noise are also expected to occur during construction. These effects are expected to be temporary and minor in nature, lasting only until the end of construction.

## 5.18 CUMULATIVE EFFECTS

Cumulative effects are defined in 40 CFR §1508.7 as those effects that result from "...the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time."

Past, present, and reasonably foreseeable actions and plans are summarized below in **Table 5-2**. Section 1.5 of the IFR/EA contains more details on reports completed in/around the project's vicinity. In addition to the previous construction of Avenida Menendez Seawall; located just north of the project area, the operation and maintenance (O&M) dredging of the ICW, and the proposed Recommended Plan, no other specific project information is known for this area. It is expected that the general public, the State of Florida, and/or local governments could have permitted activities in or around the project area. Federal activities are evaluated under NEPA directly for each project. Other projects that take place in-water or would impact wetlands are evaluated under a permit issued by USACE Regulatory Division.

## CHAPTER 5: EFFECTS OF THE RECOMMENDED PLAN

The construction of the Recommended Plan, when considered with past projects and potential future projects, has no significant cumulative effect on the environmental conditions of the project area. A summary of the cumulative effects on environmental factors from past, present, and reasonably foreseeable future actions and plans is provided in **Table 5-3**.

**Table 5-2: Past, present, and reasonably foreseeable actions and plans affecting the project area.**

<b>Past Actions/Authorized Plans</b>	<b>Current Actions and Operating Plans</b>	<b>Reasonably Foreseeable Future Actions and Plans</b>
- Construction of the Avenida Menendez Seawall	- No known projects	- O&M dredging of the ICW

Table 5-3: Summary of cumulative effects.

<b>Natural Setting (Vegetation, Wetlands, T&amp;E Species, Fish and Other Wildlife Species, EFH)</b>	
<b>Past Actions</b>	Construction of residential and commercial/public infrastructure has decreased the amount of habitat available for fish, wildlife, and T&E species use in the area.
<b>Present Actions</b>	No known present actions are occurring in the project vicinity.
<b>Recommended Plan</b>	Construction may result in temporary and minor impacts to fish, wildlife, and T&E species due to noise and/or construction activities; however, these impacts are expected to be minor and will cease with the completion of construction. In areas of excavation and installation of flowable fill (or an equivalent granular, free-draining material) , topsoil and sod will be placed on top of flowable fill (or an equivalent granular, free-draining material) in order to restore and maintain the original appearance. Detailed discussion of the effects of the proposed work on the components of the natural setting are described in Chapter 5 (Effects of the Recommended Plan), specifically sections 5.1 through 5.5.
<b>Future Actions</b>	Any Federal and/or state/local projects will be required to follow regulations to maintain and protect fish, wildlife, and T&E species and their habitats within the area.
<b>Cumulative Effect</b>	No cumulative effects to the natural setting of this area are expected.
<b>Physical Setting (Sediments, HTRW, Water Quality, Air Quality, Noise)</b>	
<b>Past Actions</b>	Construction of residential and commercial/public infrastructure has contributed to increased noise and the degradation of water and air quality through increased stormwater runoff and the potential for HTRW contamination.
<b>Present Actions</b>	No known present actions are occurring in the project vicinity.
<b>Recommended Plan</b>	Construction equipment may release negligible amounts of pollutants, including oils and grease. BMPs will be used to limit the possibility of adverse effects, and detailed pollution control plans will be developed during the D&I phase. Detailed discussion of the effects of the proposed action on the components of the physical setting are described in Chapter 5 (Effects of the Recommended Plan), specifically sections 5.6 through 5.10.
<b>Future Actions</b>	Any Federal and/or state/local projects will be required to follow regulations to maintain and protect regulated air and water quality standards within the area.
<b>Cumulative Effect</b>	Ongoing erosion, seasonal weather, and storm event effects on water quality are unlikely to be eliminated; however, implementation of the Recommended Plan will reduce erosion, improving localized water quality at this area. USACE is committed to ensuring that projects will not result in violations of water quality standards.
<b>Cultural Resources</b>	
<b>Past Actions</b>	Historic construction and urban development may have affected cultural resources.

CHAPTER 5: EFFECTS OF THE RECOMMENDED PLAN

<b>Present Actions</b>	Continued erosion may disturb archeological deposits. Failure of the seawall will directly affect the stability of Building 8 (JAG office).
<b>Recommended Plan</b>	USACE has determined that the Recommended Plan may have an adverse effect on cultural resources potentially eligible for inclusion in the NRHP. A cultural resources assessment is necessary to identify and evaluate cultural resources and determine the effects of the Recommended Plan on historic properties. Detailed discussion of the effects of the proposed action on cultural resources are described in Chapter 5 (Effects of the Recommended Plan), specifically section 5.11.
<b>Future Actions</b>	Future actions may require coordination with appropriate historic resource agencies (i.e. SHPO, NPS, ACHP, etc.) to ensure appropriate inventory, evaluation, and mitigation actions are taken with regards to any cultural resources.
<b>Cumulative Effect</b>	No cumulative effects on cultural resources are expected.
<b>Native American Resources</b>	
<b>Past Actions</b>	Historic construction and urban development may have affected Native American resources.
<b>Present Actions</b>	There are no known Native American resources in the project vicinity.
<b>Recommended Plan</b>	The Recommended Plan will not affect any known Native American Resources.
<b>Future Actions</b>	Future actions may require coordination with appropriate tribal agencies.
<b>Cumulative Effect</b>	No cumulative effects on Native American resources are expected.
<b>Socioeconomic Setting (Socioeconomics, Aesthetic and Recreational Resources, Human Health and Life Safety)</b>	
<b>Past Actions</b>	General structural urbanization of the region has increased the aesthetic, recreation, and economic resources in this area. The population in St. Augustine has been increasing since the 2010 census at a cumulative rate of about 8.6% to 2017.
<b>Present Actions</b>	The city of St. Augustine has more than 50 tourist attractions and points of interest including living history museums, many located within walking distance of one another in the downtown historic district.
<b>Recommended Plan</b>	Implementation of the Recommended Plan will ensure protection of the St. Francis Barracks and tenant facilities. Detailed discussion of the effects of the proposed action on the components of socioeconomic resources are described in Chapter 5 (Effects of the Recommended Plan), specifically sections 5.13 through 5.15.
<b>Future Actions</b>	Continued urbanization and projects to increase benefits to the economy (e.g. tourism), recreation, and aesthetics will most likely occur in this region. The City of St. Augustine's current Comprehensive Plan 2030 sets forth goals, objectives, and policies to guide physical development, while simultaneously protecting natural and cultural resources.
<b>Cumulative Effect</b>	No negative cumulative effects to the socioeconomic environment of this area are expected. The overall goal of the City's historic preservation program is to protect and preserve the historic resources of the city's built and archaeological environment and retain the city's historic integrity.

# CHAPTER 6

## ENVIRONMENTAL COMPLIANCE



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## 6 ENVIRONMENTAL COMPLIANCE

### 6.1 NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (42 U.S.C. §4321 *ET SEQ.*)

This EA, integrated with the Feasibility Report, has been prepared pursuant to NEPA and its implementing regulations. A Notice of Availability for the draft IFR/EA and proposed FONSI will be coordinated with pertinent agencies and interested stakeholders for a 30 day review and comment period. The project is in compliance with the NEPA of 1969, as amended, 42 U.S.C. §4321, *et seq.* (Public Law 91-190).

#### 6.1.1 PUBLIC AND AGENCY COORDINATION\*

Consistent with NEPA regulations and guidance, a Notice of Availability of the draft IFR/EA and the proposed FONSI will be distributed to pertinent Federal, state, and local agencies as well as interested stakeholders for a 30-day review and comment period.

#### 6.1.2 COMMENTS RECEIVED AND RESPONSES

A copy of the comments received during the 30-day agency review and public comment period, as well as a summary matrix of the comments and USACE responses, will be included in the final IFR/EA's Environmental Appendix D-3.

## 6.2 ENVIRONMENTAL COMMITMENTS

USACE and its contractors commit to avoiding and minimizing for adverse effects during construction activities by including the following commitments in the contract specifications:

#### PROTECTION OF FISH AND OTHER WILDLIFE SPECIES

Construction activities will be kept under surveillance, management, and control to minimize interference with, disturbance of, and damage to fish and wildlife. Prior to the start of construction, the contractor will submit their Environmental Protection Plan (EPP) that will include protective measures for species that require specific attention.

#### PROTECTION OF T&E SPECIES

USACE will include the 2006 NMFS's Sea Turtle and Smalltooth Sawfish Construction Conditions and 2011 USFWS's Standard Manatee Conditions for In-Water Work in the project's plans and specifications. Adverse effects to T&E species will be avoided and/or minimized. T&E species protection criteria will be included in the Contractor's EPP.

#### WATER QUALITY

Implementation of design and procedural controls will prevent oil, fuel, or other hazardous substances from entering the air or water. All wastes and refuse generated by project construction will be removed and properly disposed. Contractors will implement a spill contingency plan for hazardous, toxic, or petroleum material. Applicable state water quality standards will be met.

#### CULTURAL RESOURCES

USACE will execute a Programmatic Agreement with the Florida SHPO detailing the effort and methods for complying with Section 106 of the National Historic Preservation Act. USACE will ensure the necessary inventory and evaluation efforts will be conducted and make a determination of effects to historic properties based on the Preferred Alternative. If preservation or avoidance of historic properties is not possible, USACE will develop and execute appropriate historic properties treatment plans prior to construction, as outlined in the Programmatic Agreement.

An unexpected cultural resources finds clause will be included in the project specifications. In the event that any archaeological resources are uncovered during construction activities, all activities will be halted immediately within the area. Once reported, USACE staff will initiate coordination with the appropriate Federal and state agencies to determine if archaeological investigation is required. Additional work in the area of the discovery will be suspended at the site until compliance with all Federal and state regulations is successfully completed and USACE staff members provide further directive.

#### PROTECTION OF MIGRATORY BIRDS

Standard migratory bird protection protocols will be incorporated into the project plans and specifications. The contractor will be required to abide by those protocols and all monitoring timeframes as specified by all applicable licenses and permits.

### 6.3 ENVIRONMENTAL COMPLIANCE

#### 6.3.1 NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (42 U.S.C. §4321 *ET SEQ.*)

The project complies with the Act as discussed in Section 6.1 above.

#### 6.3.2 ENDANGERED SPECIES ACT OF 1973 (16 U.S.C. §1531 *ET SEQ.*)

Pursuant to Section 7 of the Endangered Species Act, USACE evaluated the potential effects to T&E species that may be affected by implementation of the Recommended Plan. USACE determined the project would have no effect to T&E species potentially occurring in the project vicinity. Detailed discussion on the USACE determination is included in Section 5.3. The project complies with the Act.

#### 6.3.3 FISH AND WILDLIFE COORDINATION ACT OF 1958 (16 U.S.C. §661 *ET SEQ.*)

A Memorandum for the Record, found in the Environmental Appendix D-1, will be signed by USFWS and USACE to document an agreement between the agencies to use the NEPA review and ESA consultation processes to complete coordination responsibilities under the FWCA. The project complies with this Act.

#### 6.3.4 NATIONAL HISTORIC PRESERVATION ACT OF 1966 (INTER ALIA)

USACE is pursuing a program alternative under 36 CFR 800.14 for compliance with Section 106 of the NHPA, as amended (54 U.S.C. §306108 *et seq.*). The Programmatic Agreement will outline the process in which USACE will consult with agencies to avoid, minimize, and mitigate effects of this project. By implementing and adhering to the Programmatic Agreement, the project will be in compliance with the Archaeological and Historic Preservation Act, as amended (Public Law 93-291) and the Archeological Resources Protection Act (Public Law 96-95) (16 U.S.C. § 470aa *et seq.*). Coordination was initiated with City of St. Augustine Archaeology Program on January 21, 2019 and the City of St. Augustine Historic Preservation Officer on February 22, 2019. Consultation with the Florida SHPO was initiated by telephone on February 28, 2019. The SHPO agreed to participate in the development of a Programmatic Agreement

on March 5, 2019. Consultation was initiated by letter with the Seminole Tribe of Florida, the Seminole Nation of Oklahoma, Thlopthlocco Tribal Town, and the Miccosukee Tribe of Indians of Florida on April 15, 2019.

### 6.3.5 CLEAN WATER ACT OF 1972, SECTION 401 AND SECTION 404(B) (33 U.S.C. §1341 *ET SEQ.* AND 33 U.S.C. §1344(B) *ET SEQ.*)

Construction of the project's revetment is considered fill into the waters of the United States. In compliance with the Clean Water Act of 1972, as amended, (CWA), a Section 404(b)(1) Guidelines evaluation has been completed and is included in the Environmental Appendix D-2. The project will meet the state of Florida's water quality standards. Any applicable authorizations will be obtained prior to the start of construction. The project will implement and meet all conditions imposed by the necessary authorizations in order to minimize adverse impacts to water quality. The project complies with the Act.

### 6.3.6 CLEAN AIR ACT OF 1972 (42 U.S.C. §7401 *ET SEQ.*)

St. Johns County is not designated as a nonattainment or maintenance area for any criteria pollutant; therefore, U.S. Environmental Protection Agency's (USEPA) General Conformity Rule to implement Section 176(c) of the CAA [42 U.S.C. §7506(c)] does not apply. No air quality permits nor a conformity determination are required for this project. The project complies with the Act.

### 6.3.7 COASTAL ZONE MANAGEMENT ACT OF 1972 (16 U.S.C. §1451 *ET SEQ.*)

Pursuant to the CZMA, an FCD was submitted to the state of Florida for review and concurrence. USACE determined that the Recommended Plan is consistent with the state's Coastal Zone Management Program and anticipates receiving concurrence. Pertinent correspondence is found in the Environmental Appendix D-1.. The project complies with the Act.

### 6.3.8 FARMLAND PROTECTION POLICY ACT OF 1981 (7 U.S.C. §4201 *ET SEQ.*)

No prime or unique farmland exists within the project area. This Act is not applicable.

### 6.3.9 WILD AND SCENIC RIVER ACT OF 1968 (28 U.S.C. §1271 *ET SEQ.*)

No designated wild and scenic river reaches exist within the project area. This Act is not applicable.

### 6.3.10 MARINE MAMMAL PROTECTION ACT OF 1972 (16 U.S.C. §1361 *ET SEQ.*)

To ensure the protection of any manatees present in the project area, the USFWS 2011 Standard Manatee Conditions for In-Water Work will be included in the project plans and specifications and will be implemented by the contractor during in-water work. Inclusion of these protection measures will also extend protection to any dolphins that may be in the area as well. The Project complies with this Act.

### 6.3.11 ESTUARY PROTECTION ACT OF 1968 (16 U.S.C. §§1221-26)

No designated Estuary of National Significance exists within the project area. This Act is not applicable.

### 6.3.12 FEDERAL WATER PROJECT RECREATION ACT (16 U.S.C. §460/-12 *ET SEQ.*)

The principles of the Federal Water Project Recreation Act (16 U.S.C. §460/-12 *et. seq.*) require USACE to give full consideration to any opportunity for the Project to add or improve outdoor recreation and/or fish and wildlife enhancement. Recreational resources and opportunities are considered and discussed in Chapter 2 and Chapter 5 this report. This Project complies with the Act.

### 6.3.13 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT (16 U.S.C. §801 ET SEQ.)

USACE prepared this IFR/EA consistent with the 1999 guidance provided by the NMFS Southeast Regional Office to the USACE regarding coordination of EFH consultation requirements with NEPA. USACE has determined that the Project would have minimal adverse effects on EFH and no adverse effects on federally managed fish species. USACE initiated consultation with NMFS during the public comment period. Consultation is ongoing. Pertinent correspondence is found in the Environmental Appendix D-1. The Project complies with the Act.

### 6.3.14 SUBMERGED LANDS ACT OF 1953 (43 U.S.C. § 1312 ET SEQ.)

The revetment would occur on submerged lands. The Corps will coordinate the project with the State of Florida and City of St. Augustine to comply with this Act.

### 6.3.15 COASTAL BARRIER RESOURCES ACT AND COASTAL BARRIER IMPROVEMENT ACT (16 U.S.C. §3501 ET SEQ.)

Coastal Barrier Resource Systems (CBRS) Unit P05 (Conch Island) is located approximately a third of a mile north of the Project area; however, this CBRS unit will not be affected by the Project. The Project complies with the Acts.

### 6.3.16 RIVERS AND HARBORS ACT OF 1899, SECTION 10 (33 U.S.C. §401 ET SEQ.)

The proposed work will not obstruct navigable waters of the U.S. The Project complies with the Act.

### 6.3.17 ANADROMOUS FISH CONSERVATION ACT (16 U.S.C. §§757A-757G)

This Project will have no effect on anadromous fish species. The Project complies with the Act.

### 6.3.18 MIGRATORY BIRD TREATY ACT (16 U.S.C. §§703-712) AND MIGRATORY BIRD CONSERVATION ACT (16 U.S.C. §§715-715D, 715E, 715F-715R)

USACE will include standard migratory bird protection measures in the project plans and specifications and will require the Contractor to abide by those requirements. The Project is being coordinated with USFWS and complies with these Acts.

### 6.3.19 MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT (33 U.S.C. §1401 ET SEQ.)

Ocean disposal is not a component of this Project; therefore, this Act is not applicable.

### 6.3.20 UNIFORM RELOCATION ASSISTANCE AND REAL PROPERTY ACQUISITION POLICIES ACT OF 1970 (42 U.S.C. §4601 ET SEQ.)

The purpose of Public Law 91-646 is to ensure that owners of real property to be acquired for Federal and federally assisted projects are treated fairly and consistently and that persons displaced as a direct result of such acquisition will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole. This Project does not involve real property acquisition and/or displacement of property owners or tenants. Therefore, this Act is not applicable.

#### **St. Francis Barracks Seawall Shoreline Erosion Protection CAP Section 14**

FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT

## 6.4 EXECUTIVE ORDER (E.O.) COMPLIANCE

### 6.4.1 E.O. 11988, FLOOD PLAIN MANAGEMENT

To comply with E.O. 11988, the policy of USACE is to formulate projects that, to the extent possible, avoid or minimize adverse effects associated with the use of the floodplain and avoid inducing development in the floodplain unless there is no practicable alternative. Based on the analysis in the IFR/EA, USACE concludes that the Recommended Plan will not result in harm to people, property, and floodplain values, will not induce development in the floodplain, and the Project is in the public interest. The Project complies with the Order.

### 6.4.2 E.O. 11990, PROTECTION OF WETLANDS

Wetlands will not be affected by the Project. The Project complies with the Order.

### 6.4.3 E.O. 12898, ENVIRONMENTAL JUSTICE

On February 11, 1994, the President of the U.S. issued E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This E.O. mandates that each Federal agency make environmental justice (EJ) part of the agency mission and to address, as appropriate, disproportionately high and adverse human health or environmental effects of the programs and policies on minority and low-income populations. Significance thresholds that may be used to evaluate the effects of a proposed action related to EJ are not specifically outlined. However, Council on Environmental Quality (CEQ) guidance requires an evaluation of a proposed action's effect on the human environment and USACE must comply with Executive Order 12898. USACE has determined that a proposed action or its alternatives would result in significant effects related to EJ if the proposed action or an alternative would disproportionately adversely affect an EJ community through its effects on:

- Environmental conditions such as quality of air, water, and other environmental media; degradation of aesthetics, loss of open space, and nuisance concerns such as odor, noise, and dust;
- Human health such as exposure of EJ populations to pathogens;
- Public welfare in terms of social conditions such as reduced access to certain amenities like hospitals, safe drinking water, public transportation, etc.; and
- Public welfare in terms of economic conditions such as changes in employment, income, and the cost of housing, etc.

Using the USEPA EJAssist Tool on March 19, 2019, the project area was identified (see Figure 6-2) and the average percentage for the EJ criteria are compared in Table 6-1 for the project area, the State of Florida, and U.S. averages.

**Table 6-1: USEPA EJAssist environmental justice criteria percentages.**

	User-Defined Project Area Average %	State of Florida Average %	U.S. Average %
<b>Minority Population</b>	6%	44%	38%
<b>Low Income Population</b>	7%	37%	34%



**Figure 6-1: USEPA EJAssist Tool showing the user-defined project area. (SOURCE: EJAssist Mapper Tool).**

USACE conducted an evaluation of EJ impacts using a two-step process: as a first step, the study area was evaluated to determine whether it contains a concentration of minority and/or low-income populations. Following that evaluation, in the second step, USACE determined whether the proposed action would result in the types of effects listed above in a disproportionately, high adverse manner on these populations.

As defined in Executive Order 12898 and the CEQ guidance, a minority population occurs where one or both of the following conditions are met within a given geographic area:

- The American Indian, Alaskan Native, Asian, Pacific Islander, Black, or Hispanic population of the

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affected area exceeds 50 percent; or

- The minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

An affected geographic area is considered to consist of a low-income population (i.e. below the poverty level for purposes of this analysis) where the percentage of low-income persons:

- is at least 50 percent of the total population; or
- is meaningfully greater than the low-income population percentage in the general population or other appropriate unit of geographic analysis.

Based on information provided by the USEPA EJAssist tool, the Project's minority population percentage is 5% and the low income population percentage is 7%; therefore, the Project is not located within an area of high minority and/or low income populations. No disproportionate and adverse effects to minority and/or low income populations are expected to result from the implementation of the Recommended Plan. The Project complies with the Order.

#### 6.4.4 E.O. 13045, PROTECTION OF CHILDREN FROM ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS

On April 21, 1997, the President of the U.S. issued E.O. 13045, Protection of Children from Environmental Health Risks and Safety Risks. The E.O. mandates that each Federal agency make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children and ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. The proposed action does not affect children disproportionately from other members of the population and would not increase any environmental health or safety risks to children. The Project complies with the Order.

#### 6.4.5 E.O. 13089, CORAL REEF PROTECTION

No corals or hardbottom habitats exist within the Project area. This E.O. is not applicable to the project.

#### 6.4.6 E.O. 13112, INVASIVE SPECIES

The Project's plans and specifications will include conditions to avoid the introduction and/or promotion of non-native species to the region. USACE will require the Contractor to abide by those requirements. The Project complies with the Order.

#### 6.4.7 E.O. 13186, RESPONSIBILITIES OF FEDERAL AGENCIES TO PROTECT MIGRATORY BIRDS

This E.O. requires, among other things, a Memorandum of Understanding (MOU) between the USACE and USFWS concerning migratory birds. Neither the Department of Defense MOU nor the USACE Draft MOU clearly address migratory birds on lands not owned or controlled by USACE. For many USACE civil works projects, the real estate interests are provided by the non-Federal sponsor. Control and ownership of the Project lands remain with a non-Federal interest. Measures to avoid the destruction of migratory birds and their eggs or hatchlings are described in Section 4 of this EA and are incorporated by

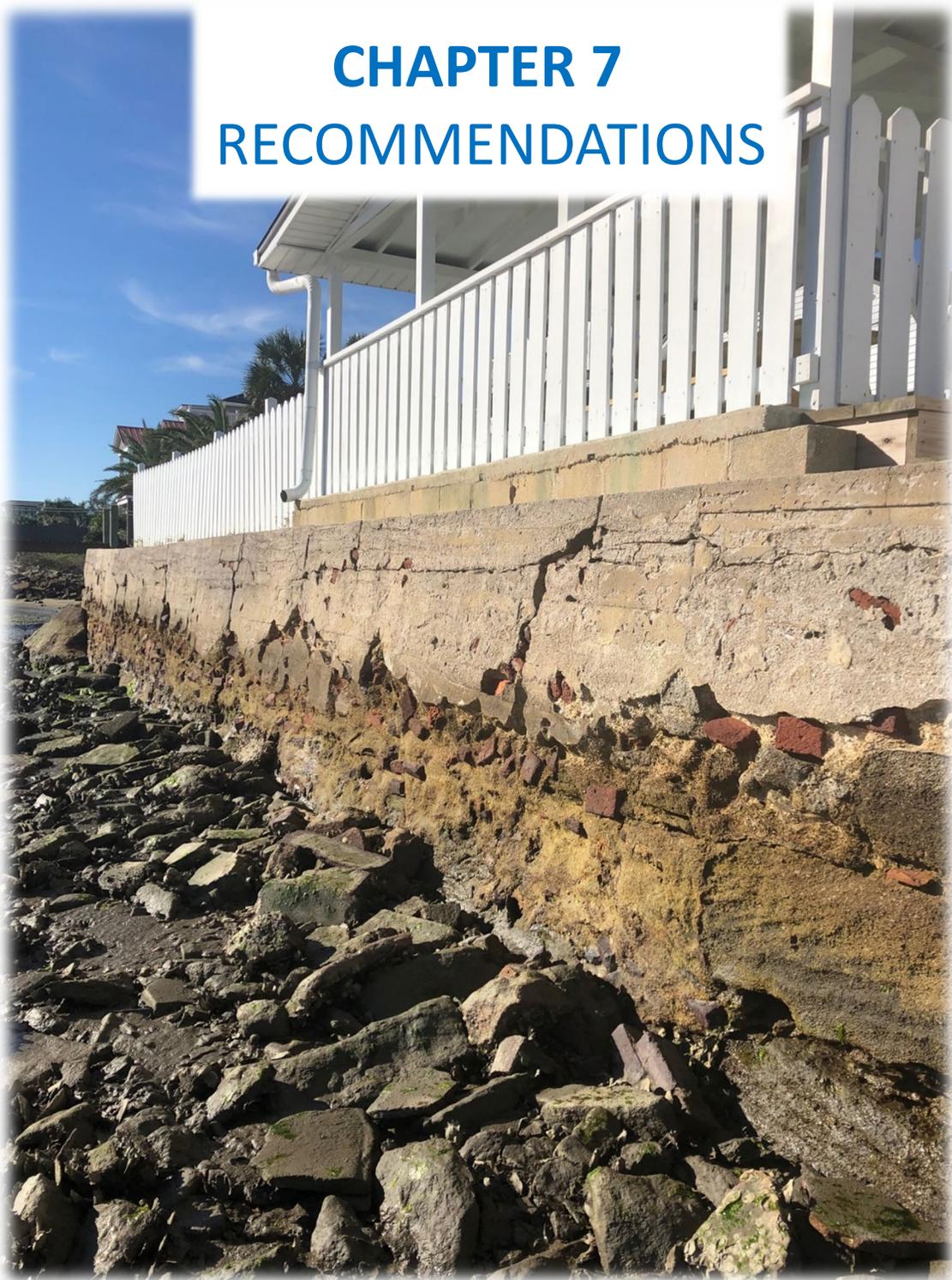
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reference. The USACE will include standard migratory bird protection requirements in the Project plans and specifications and will require the contractor to abide by those requirements. The project complies with the Order.

# CHAPTER 7

## RECOMMENDATIONS



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## 7 RECOMMENDATIONS

I, the undersigned, have given consideration to all significant aspects in the overall public interest, including engineering feasibility, economic, social, cost and risk analysis, and environmental effects. The Recommended Plan described in this draft report is in the public's interest and provides the optimum solution for shoreline erosion protection within the study area that can be developed within the framework of the formulation concepts. Implementation of the Recommended Plan for the St. Francis Barracks Seawall Shoreline Erosion Protection, CAP Section 14 Project is recommended at this time, with such modification as the Commander, South Atlantic Division, U.S. Army Corps of Engineers (SAD), deems advisable at their discretion.

The Recommended Plan is described in the previous chapters. The plan provides shoreline erosion protection of St. Francis Barracks Seawall at St. Augustine, Florida. The estimated total cost of the project is \$1,024,000 and given the nature of the cultural resources within the project site, the Project is economically justified.

### 7.1 ITEMS OF LOCAL COOPERATION

Recommendations for provision of Federal participation in the Recommended Plan described in this report would require the Project Sponsor to enter into a written Project Partnership Agreement, as required by Section 221 of the Flood Control Act of 1970 (Public Law 91-611), as amended, to provide local partnership satisfactory to the Secretary of the Army. Such local cooperation shall provide the following non-Federal responsibilities:

a. Provide 35 percent, but not to exceed 50 percent, of total Project costs assigned to emergency streambank protection, plus 100 percent of Project costs that exceed the U.S. Army Corps of Engineers (USACE) maximum Federal expenditure limit as further specified below:

(1) Enter into an agreement which provides, 35 percent, but not to exceed 50 percent, of total Project costs during the design and implementation phase, plus 100 percent of the Project costs that exceed the USACE maximum Federal expenditure limit of \$5,000,000 as defined in Section 14, and the non-Federal sponsor shall provide a minimum contribution of funds equal to 5 percent of total Project costs;

(2) Provide all lands, easements, and rights-of-way, including those required for relocations, the borrowing of material, and the disposal of dredged or excavated material, perform or ensure the performance of any relocations, and construct improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material that the Federal Government to be required or to be necessary for the initial construction, operation, and maintenance of the Project;

b. For so long as the Project remains authorized, the non-Federal sponsor will operate, maintain, and repair the completed Project, or functional portion of the Project, at no cost to the Federal Government, in a manner compatible with the Project's purposes and in accordance with applicable Federal laws and regulations and any specific directions prescribed by the Federal Government;

c. Give the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor, now or hereafter, owns or controls for access to the Project for the purpose of inspection, operating, maintaining, repairing, replacing, rehabilitating, or completing the Project. No completion, operation, maintenance, repair, replacement, or rehabilitation by the Federal Government shall relieve the non-Federal sponsor of responsibility to meet the non-Federal sponsor's obligations, or to preclude the Federal Government from pursuing any other remedy at law or equity to ensure faithful performance;

d. Hold and save the United States free from all damages arising from the initial construction, mitigation, operation, maintenance, repair, replacement, and rehabilitation of the Project and any Project related betterments, except for damages due to the fault or negligence of the United States or its contractors;

e. Keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the Project in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Partnership Agreements to Commonwealth and Local Governments at 32 Code of Federal Regulations (CFR) Section 33.20;

f. Perform, or cause to be performed, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 96-510, as amended, 42 U.S.C. 9601-9675, that may exist in, on or under lands, easements, or rights-of-way that the Federal Government determines to be required for the initial construction, operation, and maintenance of the Project. However, for lands that the Federal Government determines to be subject to the navigation servitude, only the Federal Government shall perform such investigations unless the Federal Government provides the non-Federal sponsor with prior specific written direction, in which case the non-Federal sponsor shall perform such investigations in accordance with such written direction;

g. Assume complete financial responsibility for all necessary cleanup and response costs of any CERCLA regulated materials located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be necessary for the initial construction, operation, or maintenance of the Project;

h. Agree that the non-Federal sponsor shall be considered the operator of the Project for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, and repair the Project in a manner that will not cause liability to arise under CERCLA;

i. If applicable, comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way, required for the initial construction, operation, and maintenance of the Project, including those necessary for relocations, borrow materials, and dredged or excavated material disposal, and inform all affected persons of applicable benefits, policies, and procedures in connection with the said Act;

j. Comply with all applicable Federal laws and regulations, including, but not limited to Section 601 of the Civil Rights Act of 1964, (Public Law 88-352) (42 U.S.C. 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto, as well as Army Regulation 600-7, entitled “Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army,” and all applicable Federal labor standards requirements including, but not limited to, 40 U.S.C. 3141- 3148 and 40 U.S.C. 3701 – 3708 (revising, codifying, and enacting without substantial change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq.*), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq.*), and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c *et seq.*);

k. Provide the non-Federal share of that portion of the costs of data recovery activities associated with historic preservation that are in excess of 1% of the total amount authorized to be appropriated for the Project in accordance with the cost sharing provisions of the agreement;

l. Do not use Federal funds to meet the non-Federal Sponsor’s share of total Project costs unless the Federal granting agency verifies in writing that the expenditure of such funds is authorized;

m. Recognize and support the requirements of Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended, and Section 103 of the Water Resources Development Act of 1986, (Public Law 99-662), as amended, which provides that the Secretary of the Army shall not commence the construction of any water resources Project or separable element thereof, until the non-Federal sponsor has entered into a written agreement to furnish its required cooperation for the Project or separable element;

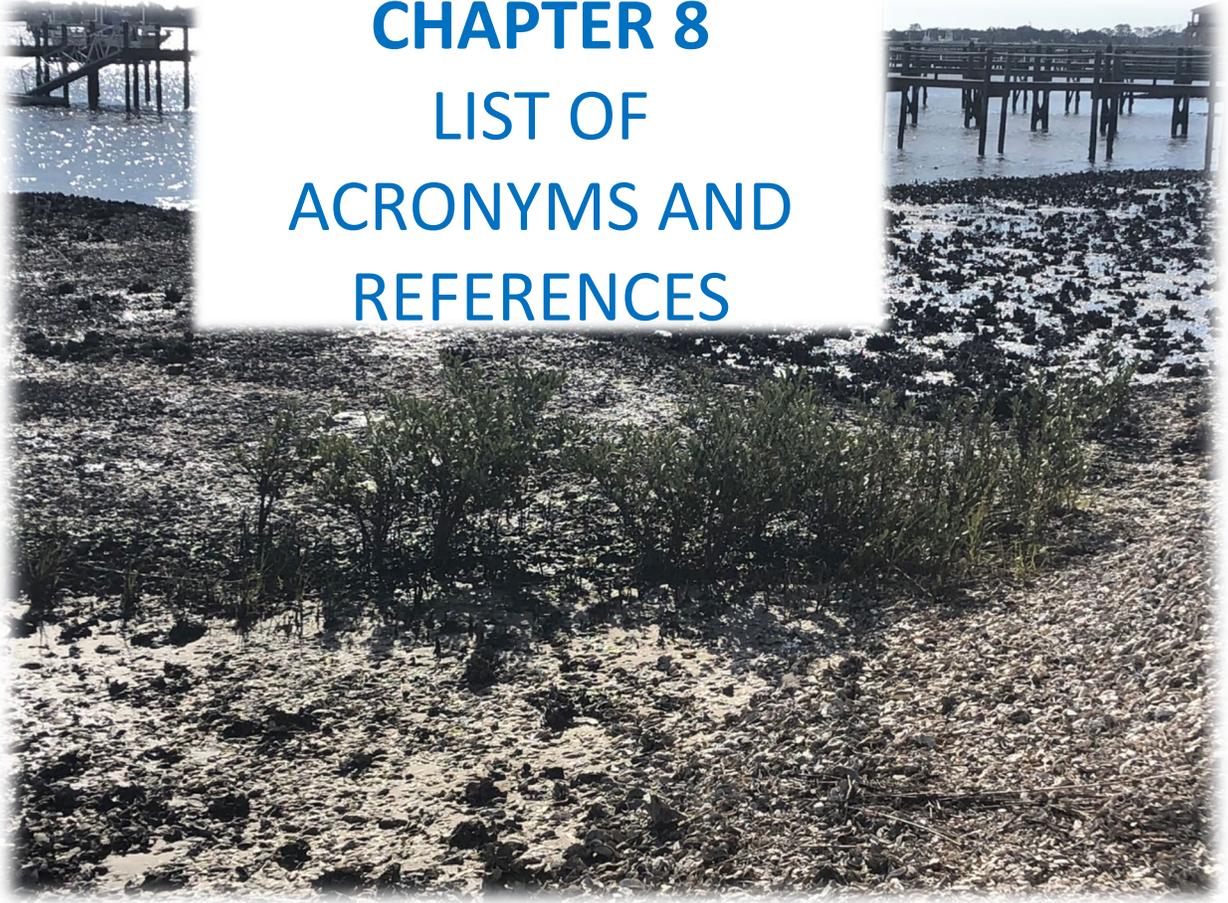
## 7.2 DISCLAIMER

The recommendations contained herein reflect the information available at this time and current U.S. Army Corps of Engineers policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national civil works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are transmitted to higher authority as proposals for project modification and/or implementation funding.

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Andrew D. Kelly, Jr.  
Colonel, U.S. Army  
District Commander

**CHAPTER 8**  
**LIST OF**  
**ACRONYMS AND**  
**REFERENCES**



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## 8 ACRONYMS AND REFERENCES

### 8.1 ACRONYMS

ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
AQCR	Air Quality Control Region
BMPs	Best Management Practices
CAA	Clean Air Act
CAP	Continuing Authorities Program
CBRS	Coastal Barrier Resource Systems
CEQ	Council of Environmental Quality
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
CLG	Certified Local Government
CWA	Clean Water Act
D&I	Design and Implementation
DMA	Florida Department of Military Affairs
DPS	Distinct Population Segment
E.O.	Executive Order
EA	Environmental Assessment
EFH	Essential Fish Habitat
EJ	Environmental Justice
EPP	Environmental Protection Plan
ER	Engineering Regulation
ESA	Endangered Species Act
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FLNG	Florida National Guard
FMSF	Florida Master Site File
FONSI	Finding of No Significant Impact
ft.	feet
GHG	Greenhouse Gases
HAPC	Habitat Areas of Particular Concern
HTRW	Hazardous, Toxic, and Radioactive Waste
ICW	Intracoastal Waterway
IFR/EA	Integrated Feasibility Report/Environmental Assessment
JAG	Judge Advocate General
LERRD	Lands, Easements, Rights-of-way, Relocations, and Disposal
MOU	Memorandum of Understanding
mph	Miles per hour
NAAQS	National Ambient Air Quality Standards
NED	National Economic Development

## CHAPTER 8: ACRONYMS AND REFERENCES

NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPS	National Parks Service
NRHP	National Register of Historic Places
NS	Non-Structural
NWI	National Wetlands Inventory
O&M	Operation and maintenance
PPA	Project Partnership Agreement
S	Structural
SAD	South Atlantic Division
SAFMC	South Atlantic Fish Management Council
SHPO	Florida State Historic Preservation Office
SLC	Sea level change
St.	Saint
T&E	Threatened and Endangered
U.S.	United States
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WQC	Water Quality Certification
WRDA	Water Resources Development Act
WRRDA	Water Resources Reform and Development Act

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