

February 2019

---

# **DRAFT ENVIRONMENTAL ASSESSMENT**

## **RIO CULEBRINAS AGUADA AND AGUADILLA, PUERTO RICO STUDY**

### **SECTION 205 FLOOD RISK REDUCTION CONTINUING AUTHORITIES PROGRAM (CAP) CONVERSION**



US Army Corps of Engineers  
JACKSONVILLE DISTRICT

---



US Army Corps of Engineers  
JACKSONVILLE DISTRICT

---

## **Proposed Finding of No Significant Impact**

### **DRAFT ENVIRONMENTAL ASSESSMENT RIO CULEBRINAS AGUADA AND AGUADILLA, PUERTO RICO STUDY SECTION 205 FLOOD RISK REDUCTION CONTINUING AUTHORITIES PROGRAM (CAP) CONVERSION**

The U.S. Army Corps of Engineers, Jacksonville District (Corps) has conducted an Environmental Assessment (EA) in accordance with the National Environmental Policy Act of 1969, as amended (NEPA). The Corps assessed the effects of the proposed action in the EA, dated June 2004, for the Rio Culebrinas Section 205 Flood Risk Reduction Continuing Authorities Program (CAP) Study at Aguada and Aguadilla in Puerto Rico. This 2019 EA updates that analysis and adopts by reference the 2004 EA where the information is valid and applicable to this evaluation.

The proposed project consists of the construction of two segments of earthen levees, a short cutoff channel, drainage structures, interior drainage channels, and three paved road ramps across the levees to reduce flood damage to the southwest portion of Aguadilla and the community of Espinar in Aguada.

In addition to the “no action” alternative, 3 alternatives with varying levels of flood risk reduction were evaluated, including the Recommended Plan. The Recommended Plan was identified as the National Economic Development Plan and is the environmentally preferable alternative. All practicable means to avoid and minimize adverse environmental effects have been incorporated into the Recommended Plan.

The Recommended Plan will result in unavoidable impacts to approximately 10.25 acres of mostly degraded wetlands within the levee right of way (formerly Coloso sugar cane fields). The Corps will mitigate for these unavoidable impacts, and proposed a conceptual plan in section 2.4 of the 2015 Detailed Project Report (DPR) Update to create wetlands by excavating 13.35 acres. Since a portion of the excavation would be in existing wetlands to ensure hydrologic connection, the total net creation of wetlands would be 11.69 acres. The final location, size, and configuration of the wetland mitigation areas are subject to change based on additional investigations on the elevation and character of material to be excavated as well as socio-economic considerations.

Pursuant to Section 7 of the Endangered Species Act of 1973, as amended, the project was coordinated with National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Services (USFWS) through the 2004 EA and will be coordinated again during the public review of this NEPA document. The Corps has determined that the project may affect, but is not likely to adversely affect, listed species under USFWS and NMFS purview. Consultation will be completed prior to the signing of this EA's Finding of No Significant Impact (FONSI). Pertinent correspondence is found in Appendix A.

Pursuant to the Magnuson-Stevens Act, the Corps determined the proposed work occurs inland and would not affect Essential Fish Habitat under the jurisdiction of NMFS. In a letter dated August 4, 1999, NMFS stated it had no comments or recommendations to offer on the project. Coordination with NMFS to address project changes is ongoing; however, the Corps does not anticipate any effects on EFH. Pertinent correspondence is found in Appendix A.

Pursuant to the Coastal Zone Management Act, a Federal Consistency Determination will be submitted to the Puerto Rico Planning Board for the Commonwealth of Puerto Rico's review and concurrence. The Corps has determined that the Recommended Plan is consistent with Puerto Rico's Coastal Zone Management Program. Pertinent correspondence is found in Appendix A.

Pursuant to the Clean Water Act of 1972, as amended, water quality certification (WQC) pursuant to Section 401 of the Clean Water Act will be obtained from the Commonwealth of Puerto Rico prior to construction. All conditions imposed by the WQC will be implemented in order to minimize adverse impacts to water quality. The Corps determined that the discharge or fill material associated with the Recommended Plan is compliant with Section 404(b)(1) Guidelines as required by the Clean Water Act. A section 404(b)(1) Guidelines Evaluation is found in Appendix C.

The Corps has initiated consultation for the Recommended Plan with the Puerto Rico Historic Preservation Officer (SHPO) pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and consideration given under NEPA. The Corps is currently coordinating a Programmatic Agreement with Puerto Rico SHPO. The Programmatic Agreement will outline the process in which the Corps will consult with the PR SHPO to avoid, minimize, and mitigate adverse effects to historic properties and will be executed prior to the signing of this EA's FONSI.

Technical and economic criteria used in the formulation of alternative plans were those specified in the Water Resource Council's 1983 Economic and Environmental Principles for Water and Related Land Resources Implementation Studies. All applicable laws, executive orders, regulations, and local government plans were considered in the evaluation of the alternatives.

It is my determination that the Recommended Plan does not constitute a major federal action that would significantly affect the human environment; therefore, preparation of an Environmental Impact Statement is not required.

---

Date

---

Andrew D. Kelly, Jr.  
Colonel, Corps of Engineers  
District Commander

# TABLE OF CONTENTS

1	PROJECT PURPOSE AND NEED .....	1
1.1	PROJECT DESCRIPTION.....	1
1.2	PROJECT AUTHORITY.....	3
1.3	PROJECT NEED OR OPPORTUNITY .....	3
1.4	RELATED ENVIRONMENTAL DOCUMENTS.....	3
1.5	DECISIONS TO BE MADE .....	4
1.6	SCOPING AND ISSUES.....	4
1.7	WATER QUALITY CERTIFICATION AND COASTAL ZONE MANAGEMENT ACT 5	
2	ALTERNATIVES .....	6
2.1	NO ACTION ALTERNATIVE.....	6
2.2	2004 RECOMMENDED PLAN.....	6
	EARTHEN LEVEES, CUTOFF CHANNEL, AND DRAINAGE FEATURES FOR 100-YEAR FLOOD .....	6
2.3	2015 RECOMMENDED PLAN.....	10
	THE 2004 RECOMMENDED PLAN, INCLUDING 2015 DESIGN MODIFICATIONS	10
2.4	ALTERNATIVES ELIMINATED FROM FURTHER EVALUATION.....	10
2.5	RECOMMENDED PLAN AND BASIS FOR CHOICE .....	10
3	EXISTING ENVIRONMENT .....	11
3.1	NATURAL SETTING.....	11
	(VEGETATION, WETLANDS, ENDANGERED AND THREATENED SPECIES, FISH AND WILDLIFE RESOURCES, AND EFH).....	11
3.2	PHYSICAL SETTING.....	11
	(CBRS, WATER QUALITY, HTRW, PRIME AND UNIQUE FARMLAND SOILS, CLIMATE CHANGE, AIR QUALITY, NOISE) .....	11
3.3	SOCIOECONOMIC RESOURCES .....	13
	(ECONOMICS, AESTHETIC RESOURCES, RECREATION RESOURCES) .....	13
3.4	CULTURAL RESOURCES .....	14
3.5	HURRICANE MARIA STORM EFFECTS .....	15
4	ENVIRONMENTAL EFFECTS.....	18
4.1	CUMULATIVE EFFECTS.....	28
5	PUBLIC AND AGENCY COORDINATION.....	31
5.1	COMMENTS RECEIVED AND CORPS' RESPONSES.....	31
6	ENVIRONMENTAL COMMITMENTS AND COMPLIANCE .....	32

7	LIST OF PREPARERS .....	38
8	ACRONYM LIST .....	39
9	REFERENCES.....	40

## **LIST OF APPENDICES**

Appendix A – Project Correspondence
Appendix B – Environmental Justice Analysis
Appendix C – Clean Water Act 404(b)(1) Guidelines Evaluation
Appendix D – Public and Agency Project Comments and Corps’ Responses
Appendix E – Reports and Other Related Documents

## **LIST OF FIGURES**

Figure 1. Rio Culebrinas Section 205 project location map.....	2
Figure 2. Recommended Plan features.....	8
Figure 3. Recommended Plan cross sections.....	9
Figure 4. USFWS CBRS units in the project area.....	12
Figure 5. USEPA resource mapper HTRW sites.....	13
Figure 6. Caño Madre Veija flooding post-hurricane Maria in 2017.....	16
Figure 7. Caño Madre Veija flooding post-hurricane Maria in 2017.....	17

## **LIST OF TABLES**

Table 1. Summary and comparison of the potential environmental consequences associated with the implementation of the No Action Alternative and Recommended Plan.....	19
Table 2. Past, present, and reasonably foreseeable actions and plans affecting the project area.....	28
Table 3. Summary of cumulative effects.....	28
Table 4. Corps' environmental commitments.....	32
Table 5. Proposed project's environmental act and E.O. compliance status.....	33

# **DRAFT ENVIRONMENTAL ASSESSMENT**

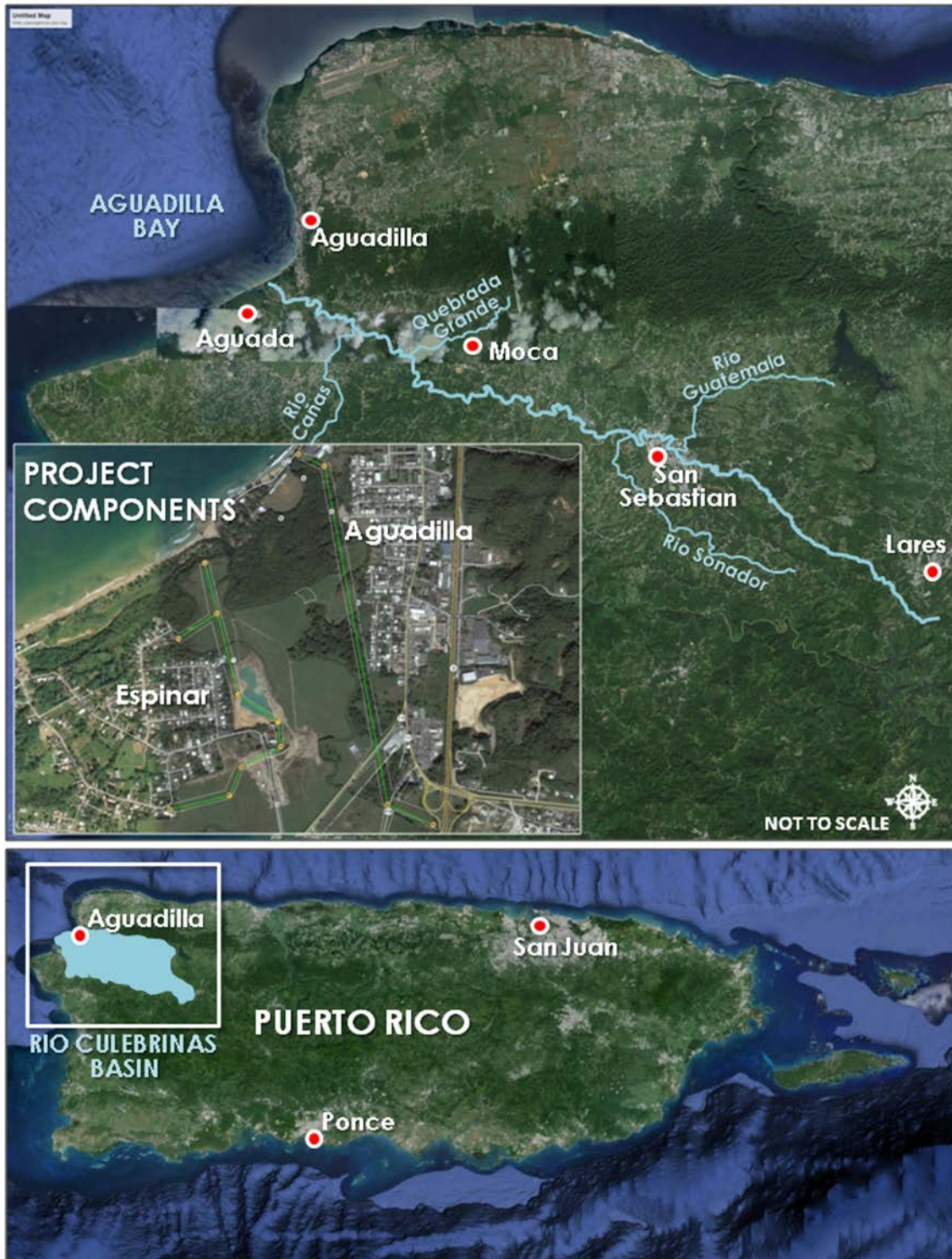
## **RIO CULEBRINAS AGUADA AND AGUADILLA, PUERTO RICO STUDY SECTION 205 FLOOD RISK REDUCTION CONTINUING AUTHORITIES PROGRAM (CAP) CONVERSION**

### **1 PROJECT PURPOSE AND NEED**

#### **1.1 PROJECT DESCRIPTION**

The U.S. Army Corps of Engineers, Jacksonville District (Corps), proposes to construct two segments of earthen levees, a short cutoff channel, drainage structures, interior drainage channels, and three paved road ramps across the levees to reduce flood damage to the southwest portion of Aguadilla and the community of Espinar in Aguada, Puerto Rico. The non-Federal sponsor (NFS) is the Municipality of Aguadilla.

The Rio Culebrinas is approximately 43.94 kilometers (km) (27.3 miles) long and originates in the western part of the central mountain range of Puerto Rico, approximately 130 km (80.8 miles) west of the city of San Juan (see **Figure 1**). The Rio Culebrinas flows in a westerly direction through the areas of San Sebastian, Moca, Aguadilla, and Aguada where the river discharges into the Aguadilla Bay in the Mona Passage on the northwestern coast of Puerto Rico. Tributaries of the Rio Culebrinas include the Caño Madre Vieja, Rio Guatemala, Rio Caño, Rio Sonador, and Quebrada Grande. The Caño Madre Vieja, a 2.09 km (1.3 miles) long tributary of Rio Culebrinas, is an old river outlet that flows across the project area and discharges into the Aguadilla Bay. This small intermittent stream is the political boundary dividing the municipalities of Aguadilla and Aguada.



**Figure 1. Rio Culebrinas Section 205 project location map.**  
 (SOURCE: Corps 2018)

More detailed information on the project can be found in the documents listed in section 1.4 of this report.



## **1.2 PROJECT AUTHORITY**

The Rio Culebrinas project was initially authorized under the Continuing Authorities Program (CAP), Section 205 of the Flood Control Act of 1948, Public Law 80-858, as amended. Completion of all components of the approved plan are necessary to achieve full project benefits. No portion of the project has been constructed since the project's initial approval. The project cost exceeded the capacity of the statutory CAP budget limits. The project is now being planned under the authority of Section 204 of the Flood Control Act of 1970, Public Law 91-611, authorizing the Secretary of the Army, acting through the Chief of Engineers, to prepare plans for the development, utilization and conservation of water and related land resources of drainage basins and coastal areas in the Commonwealth of Puerto Rico.

Division B, Subdivision 1, Title IV of the Bipartisan Budget Act (BBA) of 2018 (Public Law 115-123), authorizes the Corps to conduct the study at full federal expense to the extent that appropriations provided under the Investigations heading of the 2018 BBA are available and used for such purpose. A more detailed discussion on the project authority can be found in Appendix D (Other Reports and Documents), specifically the 2019 CAP Conversion Addendum Report.

## **1.3 PROJECT NEED OR OPPORTUNITY**

The purpose of the project is to reduce flood damages to the southwest portion of Aguadilla and the community of Espinar in Aguada, Puerto Rico. Although flooding in the Rio Culebrinas basin can occur at any time during the year, it is most frequent during the period of May through December. The large rainfall-driven peak discharges in the basin are generally associated with hurricanes, tropical depressions and tropical waves passing over or near Puerto Rico. Due to the steep slopes in the upper basin, flash floods from intense thunderstorms are a common event affecting this area and can occur anytime during the year. During the flood season, floodwaters overtopping the Rio Culebrinas and Caño Madre Vieja pose potential dangers to surrounding residents, inundate all major highways and roads in the Rio Culebrinas floodplain, and are a source of frequent flood damage to properties. Effects from Hurricane Maria, which hit the island in September 2017, prompted the Corps to include the project for consideration for funding under the BBA. (Effects from the storm are discussed more in this EA's section 3.5 Hurricane Maria Storm Effects.)

This Environmental Assessment (EA) evaluates the Recommended Plan, which is described in detail in Section 2.2. This EA also completes the required analysis under National Environmental Policy Act (NEPA) and adopts the 2004 EA by reference where the information is valid and applicable to this evaluation.

## **1.4 RELATED ENVIRONMENTAL DOCUMENTS**

The Recommended Plan is detailed in the 2004 Rio Culebrinas Aguadilla-Aguada, Puerto Rico Final Detailed Project Report (DPR) and EA, 2015 DPR Addendum, and the 2019 CAP Conversion Addendum Report. These documents are available on the Corps' environmental website, under Puerto Rico, at the following link:

<http://www.saj.usace.army.mil/About/Divisions-Offices/Planning/Environmental-Branch/Environmental-Documents/>

(On that page, click on the “+” next to “Puerto Rico” and scroll down to the project name.)

## **1.5 DECISIONS TO BE MADE**

This NEPA document will analyze whether the implementation of the project will result in significant effects on the human environment. The need for mitigation measures or best management practices to reduce any potentially adverse effects, particularly in regards to associated activities, will be further defined in Preconstruction Engineering Design (PED) phase. The Corps will make the decision to sign the Finding of No Significant Impact (FONSI) and move forward with the Recommended Plan if no significant impacts on the human environment are identified. If significant impacts are identified, the Corps will choose to implement mitigation measures to reduce the impacts 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 EA concludes that the project, as described in the Recommended Plan, is in the public interest and would not significantly affect the quality of the human environment. (See Chapter 4 for the effects of the Recommended Plan.) The Corps and its contractors commit to avoiding, minimizing, and mitigating for adverse effects during construction activities. Environmental commitments, as discussed in Section 6, will be included in the contract specifications.

## **1.6 SCOPING AND ISSUES**

Environmental scoping started in February 1991 during the reconnaissance level studies. A scoping letter, dated July 14, 1995, was issued for the project and circulated to applicable federal and Commonwealth agencies. Pursuant to NEPA, the draft DPR and EA were circulated for comments from April 29, 2002 through June 4, 2002. Comments received during the public and agency review period were incorporated into the EA prior to the signature of the FONSI. A public outreach meeting was held November 6, 2018 in Aguadilla for the project. The 2019 proposed EA and Proposed FONSI and associated appendices will be released for a 60-day public and agency review and comment period.

### **1.6.1 RELEVANT ISSUES**

The Corps identified the following issues as relevant to the Recommended Plan and appropriate for further evaluation: vegetation, wetlands, endangered and threatened species, fish and wildlife resources, essential fish habitat (EFH), coastal barrier resource system (CBRS) units, water quality, hazardous, toxic, and radioactive waste (HTRW), prime and unique farmland soils, air quality, noise, aesthetic resources, recreation resources, socioeconomic resources, cultural resources, unavoidable adverse environmental effects, and cumulative effects. The Corps analyzed many of these issues in the 2004 EA. The 2019 EA updates that analysis and adopts the 2004 EA by reference where the information is valid and applicable to this evaluation. Please see **Table 1** for additional information.

## 1.6.2 ISSUES ELIMINATED FROM FURTHER ANALYSIS

No issues were identified for elimination.

## **1.7 WATER QUALITY CERTIFICATION AND COASTAL ZONE MANAGEMENT ACT**

Pursuant to Section 401 of the Clean Water Act of 1972, as amended, water quality certification (WQC) will be obtained from the Commonwealth of Puerto Rico prior to construction. Pursuant to the Coastal Zone Management Act, a Federal Consistency Determination will be submitted to the Puerto Rico Planning Board for the Commonwealth of Puerto Rico's review and concurrence. The Corps has determined that the Recommended Plan is consistent with Puerto Rico's Coastal Zone Management Program. Pertinent correspondence is found in Appendix A.

## 2 ALTERNATIVES

This EA only evaluates changes from the 2004 Recommended Plan to ensure that any new potential environmental consequences on the human environment are fully analyzed and disclosed to the public. Section 4 (Environmental Effects) compares the alternatives in more detail, providing a clear basis for choice to the decision maker and the public. The project's Recommended Plan best meets the project objectives and constraints and is environmentally acceptable and economically justified.

### 2.1 NO ACTION ALTERNATIVE

NEPA regulations refer to the No Action Alternative as the continuation of existing conditions of the affected environment without implementation of, or in the absence of, the Recommended Plan and 40 C.F.R. §6.205 requires an agency to assess the No Action Alternative in an EA. Under this alternative, existing and prospective flooding conditions would continue. Damages to communities experiencing the flooding could increase if development continues in these areas. Flooding, and its associated damages, may result in potential human health and safety issues.

### 2.2 2004 RECOMMENDED PLAN

#### **EARTHEN LEVEES, CUTOFF CHANNEL, AND DRAINAGE FEATURES FOR 100-YEAR FLOOD**

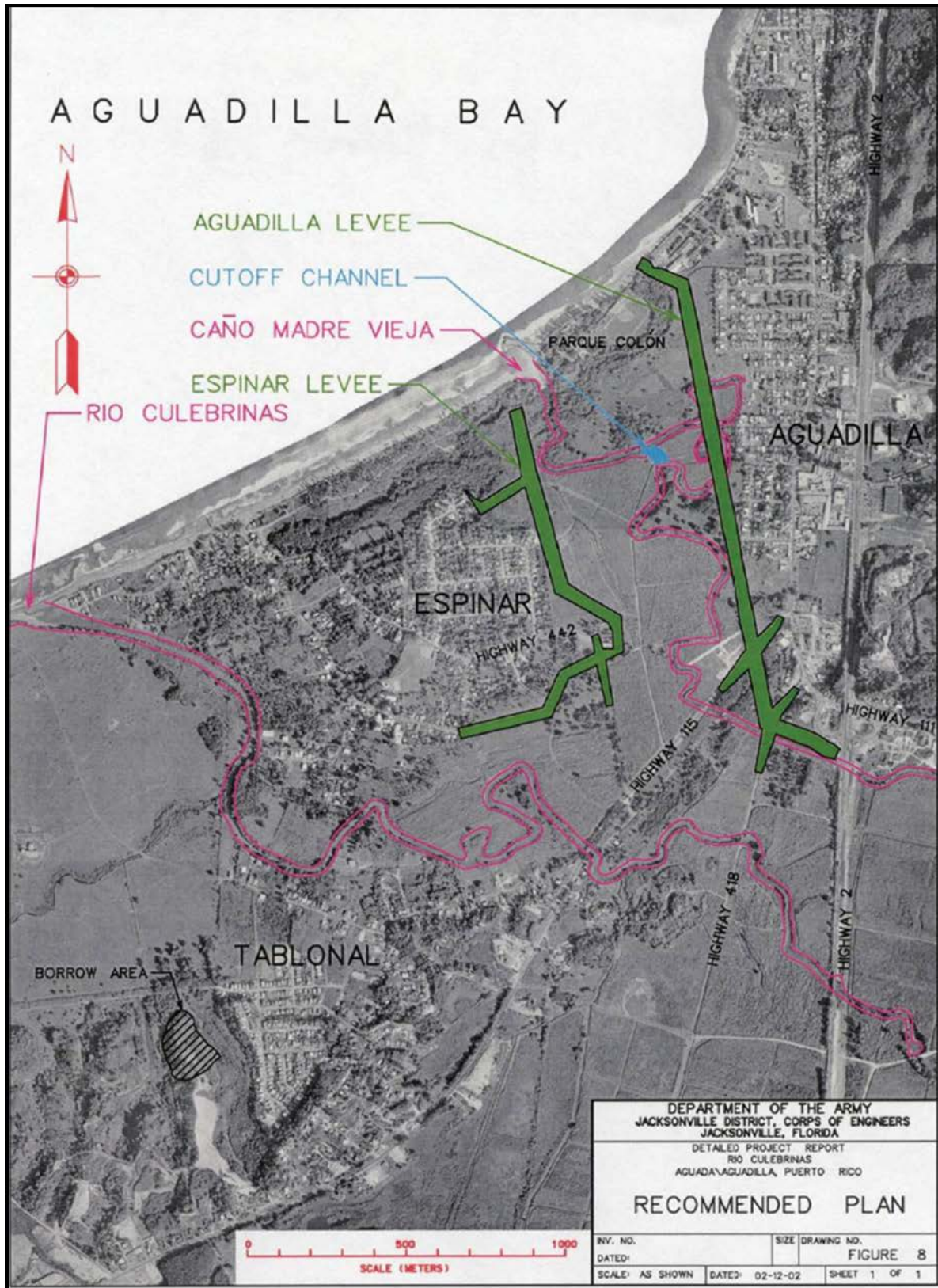
The 2004 Recommended Plan (see **Figure 2** and **Figure 3**), maximizes the National Economic Development (NED) benefits and consists of the construction of two drainage levees with a combined total length of approximately 3.3 kilometers (km) (2.05 miles) and average height of 2.5 meters (8.2 feet) with 3:1 side slopes and levee crest of 3 meters (9.84 feet). The Espinar Levee begins at the southern end of the Espinar community and extends east then north for approximately 1.5 km (0.93 miles) and ends south of the Caño Madre Vieja mouth. The Aguadilla Levee begins near Highway 2 and extends north for approximately 1.8 km (1.12 miles) and ends near Yumet Avenue. The Aguadilla Levee will transect the Caño Madre Vieja. A cutoff channel, measuring approximately 60 meters long by 4 meters deep by 43.2 meters wide (196.85 feet long by 3.12 feet deep by 141.73 feet wide), will be constructed to reconnect the two sections of the Caño Madre Vieja interrupted by the levee. Three paved roadway ramps will also be constructed across the levees.

In addition to the levees and cutoff channel, other drainage components of the project include:

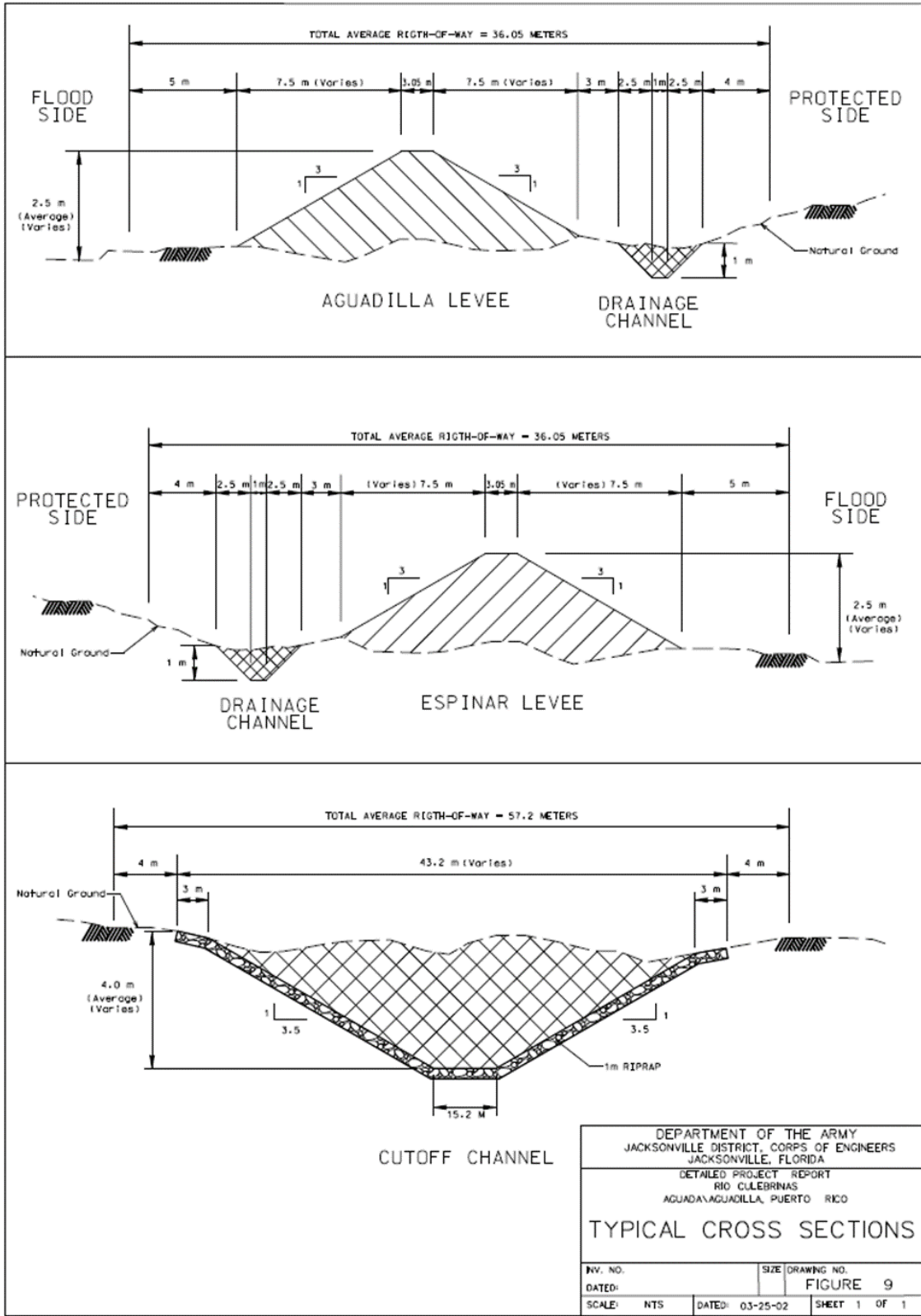
- Interior drainage channels measuring approximately 1 meter deep by 7 meters wide (3.28 feet deep by 22.97 feet wide) constructed adjacent to the protected side of the levees;
- One, two-way drainage structure near the north end of the Espinar levee;
- Three, one-way drainage structures along the Aguadilla levee.

The construction of the 100-year levees, interior drainage facilities, and cutoff channel would require approximately 84,101 cubic meters (110,000 cubic yards) of fill.

Approximately 24,466 cubic meters (32,000 cubic yards) would come from the excavation of the cut-off and interior drainage channels, while the rest of the fill would come from a permitted and approved commercial borrow site.



**Figure 2. Recommended Plan features.**  
 (SOURCE: Corps 2018)



**Figure 3. Recommended Plan cross sections.**  
(SOURCE: Corps 2018)

## **2.3 2015 RECOMMENDED PLAN**

### **THE 2004 RECOMMENDED PLAN, INCLUDING 2015 DESIGN MODIFICATIONS**

Due to new Corps standards and guidelines, the 2004 Recommended Plan required several design modifications. Design changes include the use of concrete (instead of metal) culverts, armoring for the cutoff channel, and revisions to the levee side slopes to meet current Corps levee design guidance criteria. The dimensions of the levees increased from 2.5:1 in the 2004 plan to 3:1 in the 2015 plan. The 2004 project was self-mitigating; however, due to the increases in the width of the levee cross sections and the need for additional lands, the current project was reviewed for its potential environmental impacts with respect to adjacent wetlands. The Corps determined that the revised levee design would affect additional wetlands more than anticipated in 2004 and thus a mitigation plan would be implemented. The Recommended Plan will result in unavoidable impacts to approximately 10.25 acres of mostly degraded wetlands within the levee right of way (formerly Coloso sugar cane fields). The Corps will mitigate for these unavoidable impacts and has proposed a conceptual mitigation plan in section 2.4 of the 2015 DPR update, which would create wetlands by excavating 13.35 acres. Since a portion of the mitigation plan's excavation would be in existing wetlands to ensure hydrologic connection, the total net creation of wetlands would be 11.69 acres. The final location, size, and configuration of the wetland mitigation areas are subject to change based on additional investigations on the elevation and character of material to be excavated as well as socio-economic considerations. A more detailed description of the 2015 updates to the project, including discussion on the conceptual mitigation plan, can be found in Appendix E (Reports and Other Related Documents), specifically 2015 DPR Addendum.

## **2.4 ALTERNATIVES ELIMINATED FROM FURTHER EVALUATION**

Two alternatives (in addition to the 2004 Recommended Plan) were considered in the 2004 DPR and EA:

- Same components as described in the Recommended Plan but for 50-year flood
- Same components as described in the Recommended Plan but levees would be higher and wider to provide protection for the Standard Project Flood.

These alternatives did not maximize the NED benefits and were eliminated from further evaluation, however, more detailed information can be found in the 2004 DPR and EA.

## **2.5 RECOMMENDED PLAN AND BASIS FOR CHOICE**

**Table 1** in Section 4 lists the factors considered in the alternatives comparison process and provides the analysis of the major features and consequences of each alternative in comparison to one another. The No Action Alternative is not carried forward as it does not meet the mission. During the 2015 project update, new Corps standards and guidelines were applied to the 2004 Recommended Plan. The necessary changes resulted in a new alternative, the 2015 Recommended Plan, which is also being carried forward as this EA's recommended plan. In consideration of applicable factors listed in 33 CFR section 320.4, the Corps has determined the 2015 Recommended Plan is not contrary to public interest and is therefore, carried forward as the preferred alternative.



### **3 EXISTING ENVIRONMENT**

The Existing Environment Section describes the existing environmental resources of the areas that would be affected if any of the alternatives were implemented. This section describes only those environmental resources that are relevant to the decision to be made. It does not describe the entire existing environment, but only those environmental resources that will affect or that will be affected by the alternatives if they were implemented. This section, in conjunction with the description of the No Action Alternative, forms the baseline conditions for determining the environmental effects of the reasonable alternatives.

A brief summary of existing conditions is included in this section; however, a full detailed analysis is provided within the 2004 DPR and EA and is hereby incorporated by reference within this EA. The 2004 DPR and EA is available on the Corps' environmental website, under Puerto Rico.

#### **3.1 NATURAL SETTING**

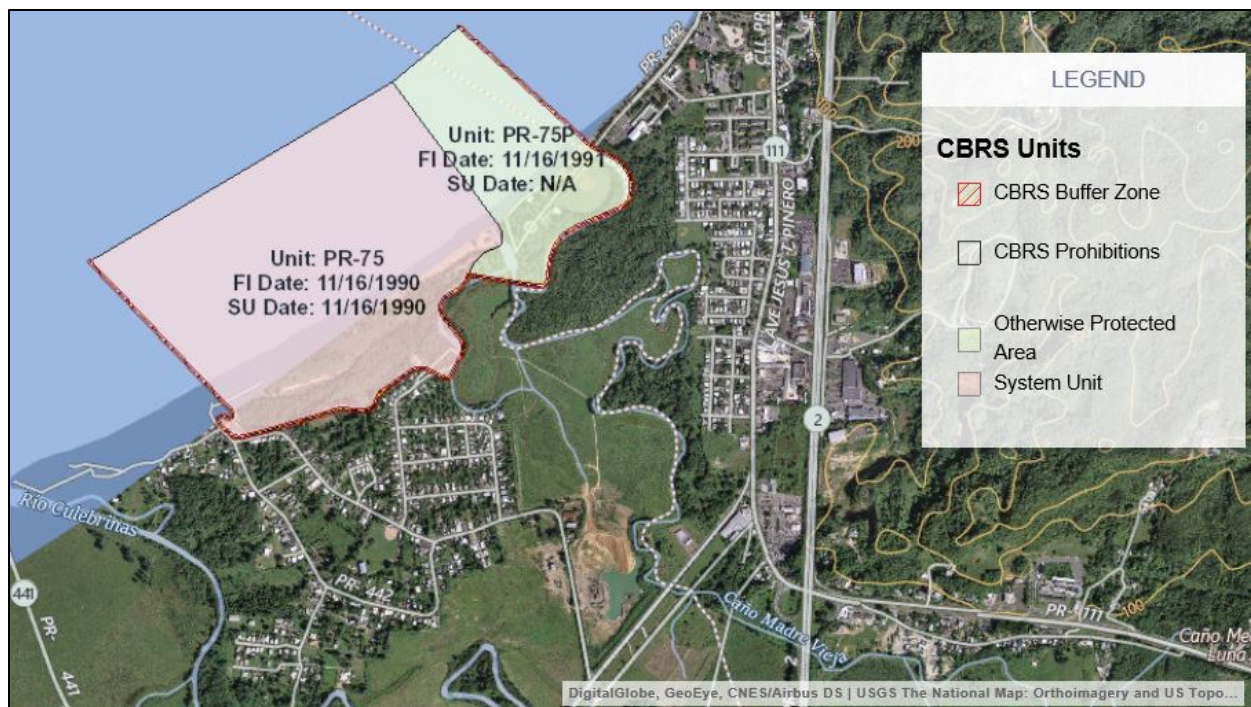
##### **(VEGETATION, WETLANDS, ENDANGERED AND THREATENED SPECIES, FISH AND WILDLIFE RESOURCES, AND EFH)**

Most of the lands in the project area are unimproved pasture or formerly planted in sugar cane and have since reverted to mixed upland and/or wet grassland vegetation such as grasses, herbs, and salt-tolerant shrubs. The mixed pasture and emergent wetlands of the area do not appear to be significant habitat; therefore, wildlife in this area is not very diverse or unusual. Wildlife species, such as lizards, frogs, birds, rats, and crustaceans, are commonly seen in the area. The U.S. Fish and Wildlife Services (USFWS) 1999 Coordination Act Report (CAR) identified freshwater river shrimp (*Macrobrachium carcinus*) as an aquatic species of concern in this area. Additionally, the federally listed endangered Puerto Rican boa (*Epicrates inornatus*) may occur in the project area. No effect to EFH is anticipated as the project occurs inland. In a letter dated August 4, 1999, NMFS stated it had no comments or recommendations to offer on the project with regard to EFH.

#### **3.2 PHYSICAL SETTING**

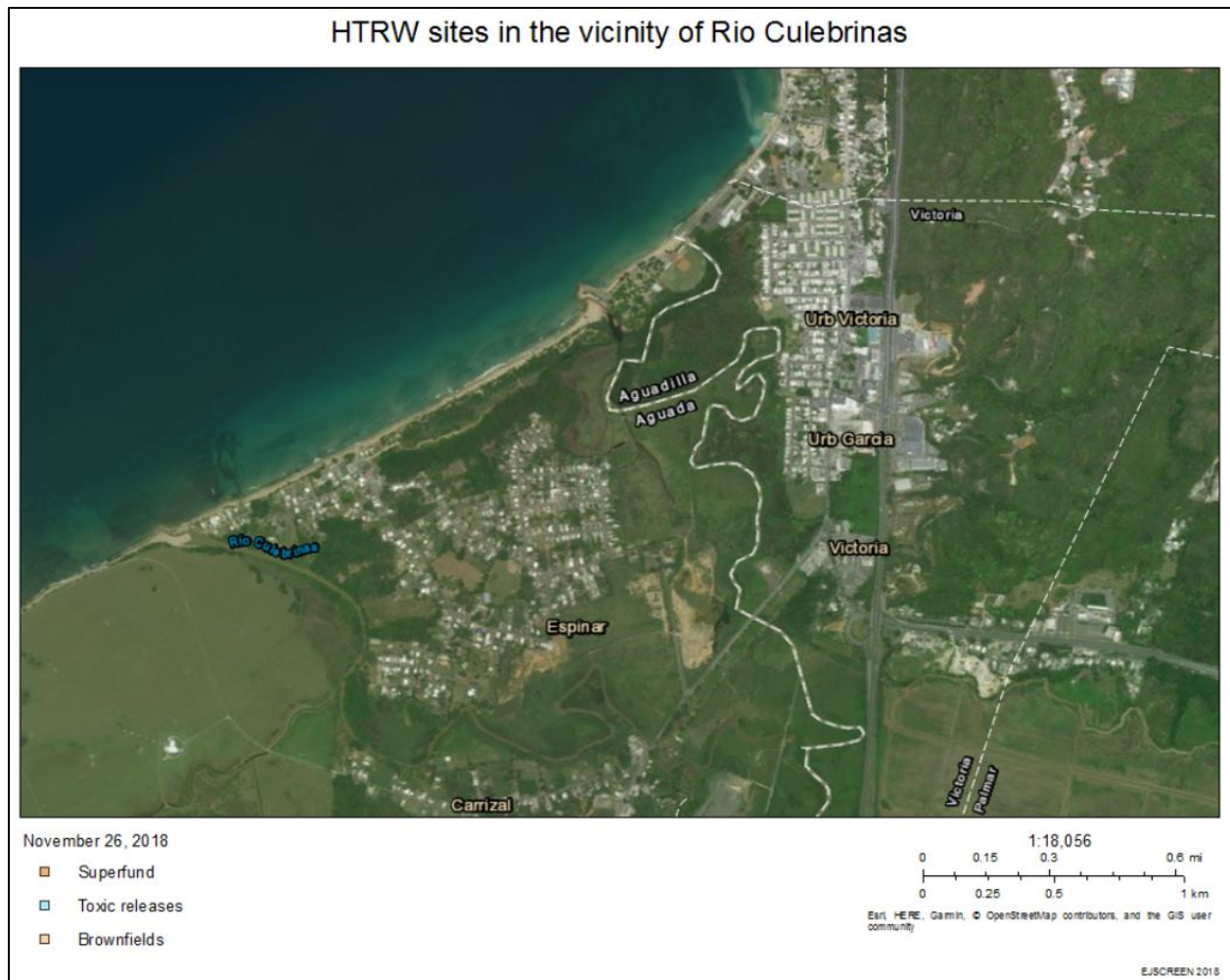
##### **(CBRS, WATER QUALITY, HTRW, PRIME AND UNIQUE FARMLAND SOILS, CLIMATE CHANGE, AIR QUALITY, NOISE)**

Rio Culebrinas and Caño Madre Vieja are Class SD Surface Waters. Class SD waters are intended for use as a raw source of public water supply, propagation and preservation of desirable species as well as primary and secondary contact recreation. Primary contact recreation is precluded in any water body or segment that does not comply with Rule 1303.2 (D) (2) (m) until such water body or segment meets the goal of the referred section. CBRS Units PR-75 and PR-75P are located adjacent to, but not within, the project area (see **Figure 4**).



**Figure 4. USFWS CBRS units in the project area.**  
 (SOURCE: USFWS CBRS mapper)

A civil works audit in May 1995 (updated in May 1999) and the HTRW review conducted in the 2004 EA determined HTRW contamination is negligible in the study area due to the predominant land use being agricultural and no known spills, problems, or sites were known to be in the study area. A review of the U.S. Environmental Protection Agency's (USEPA) EnviroMapper in November 2018 confirmed there are no superfund, toxic release, or brownfield sites in the project vicinity (see **Figure 5**).



**Figure 5. USEPA resource mapper HTRW sites.**  
(SOURCE: USEPA EnviroMapper)

Prime and unique farmland soils exist in the project area. Coordination with the Natural Resources Conservation Service (NRCS) for effects in the project footprint was completed in the 2004 EA. The climate in this region is characteristically tropical, with annual rainfall varying from a mean low of 45 inches to a mean high of 81 inches. Climate change requires for Corps' projects changed in 2018. Reanalysis of the effects of climate change will occur during the PED phase. In addition, section 2.2 of the 2019 CAP Conversion Addendum Report (see Appendix E) includes more discussion on climate and climate change. The municipalities of Aguada and Agudilla are located in Air Quality Control Region "Puerto Rico", which is considered as being in attainment with the National Ambient Air Quality Standards. The project area is located in rural municipalities, where noise levels are low, except in the immediate vicinity of roads and neighborhoods.

### 3.3 SOCIOECONOMIC RESOURCES (ECONOMICS, AESTHETIC RESOURCES, RECREATION RESOURCES)

The population centers within the study area are: Agudilla, Aguada, and Espinar (which

is unincorporated and part of the Aguada municipality). According to the 2010 Census, the populations of Aguadilla and Aguada are 60,898 and 41,912\*, respectively (\*including approximately 1,400 people in Espinar). Development within the study area is primary residential in nature, with nearly 800 residential properties (both single family homes and multi-family residences) subject to flooding. There are also approximately 100 commercial properties (including retail stores, restaurants, pharmacies, business/service offices, and gas stations) as well as 24 public properties. Notable properties in the study area include a police department, a US Army reserve station, a senior center, and a historic church (the Emerita de Espinar).

The primary economic activity in Aguadilla is manufacturing, including rubber, textiles, plastics, and other products. Most manufacturing facilities in Aguadilla are located in one of two major industrial parks, the San Antonio Technological Park or the Camaseyes Industrial Park. Other important economic activities in Aguadilla include tourism and service industries, healthcare, retail, and commercial fishing. One of Puerto Rico's most important airports, the Rafael Hernandez international airport, is located near the city. The primary economic activities in Aguada are tourism, agriculture and agricultural processing, light manufacturing, commercial fishing, services, and retail. Both cities have a mixed income socioeconomic profile, with some affluent households but also relatively high unemployment (greater than 10% in both cities).

The 2004 DPR/EA noted key infrastructure in the study area, including:

- The Aguadilla Wastewater Treatment Facility
- An Electric Power Transmission facility and eight substations
- Several major roads and highways, including highway PR-2, 110, and 115.
- Second largest airport in Puerto Rico, the Rafael Hernandez international airport

All of the noted infrastructure is still located in the study area. No major infrastructure improvements have occurred since 2004.

Census data indicate that the population in the study area actually decreased slightly between 2004 and 2017 (the last date for which data are available). This was partly due to an economic crisis that has affected Puerto Rico since the Great Recession began in 2008. Over the past decade, the island has seen a net migration trend away from the island and decreasing population overall. In the short term this effect may continue due to the lingering effects of Hurricane Maria, which had a devastating effect both within the study area and throughout the island. In the longer term, the population is expected to stabilize and begin increasing.

### **3.4 CULTURAL RESOURCES**

The Rio Culebrinas valley is a very important area in both the prehistoric and recent history of Puerto Rico. The area was inhabited throughout the Ceramic age of prehistory, demonstrated by archeological sites containing Saladoid and Ostionoid series ceramics. A nine-kilometer (5.4 mile) stretch of coastline encompassing the study area is the conjectured 1493 landing site of Columbus. Sir Francis Drake visited the area in 1595. The *Iglesia de Espinar*, is located adjacent to the Espinar levee and is one of Puerto

Rico's earliest churches. The church was originally constructed in 1526 and is eligible for listing in the National Register of Historic Places (NRHP). The Culebrinas River floodplain was heavily utilized for agriculture in the nineteenth and twentieth centuries, and as a result, numerous sugar producing haciendas and sugar processing molinos (sugar mills) were established near the study area.

Based on the high probability for historic properties to be located within the study area, a cultural resources survey of the proposed levee alignment was conducted in 1999. As a result of this survey, two archaeological sites eligible for the NRHP (Culebrinas Site 1 and the Iglesia de Espinar archaeological site) were identified within the proposed Espinar Levee footprint. One archaeological site was also identified within the proposed Aguadilla Levee footprint (Culebrinas Site 2); however, more information is necessary to determine if the site is eligible for inclusion in the NRHP.

Culebrinas Site 1 is a multicomponent site that was occupied through the late prehistoric period to the early-nineteenth century. The site predominately consists of historic ceramic artifacts with a small number of prehistoric lithic artifacts. The Iglesia de Espinar archaeological site was identified east of the existing historic church. The Church is known locally as *Iglesia de Espinar* or the *Hermitage of Immaculada Concepcion of Barrio Espinar* and located adjacent to the Espinar levee. The Iglesia de Espinar archaeological site represents historic ceramics and architectural materials likely associated with the early church community. During the initial study, both Culebrinas Site 1 and the Iglesia de Espinar archaeological site were determined eligible for inclusion in the NRHP and avoidance, minimization, or mitigation of adverse effects caused by the 2004 Recommended Plan was determined necessary.

Culebrinas Site 2 consists of a scatter of historic period artifacts, likely dating from the late-nineteenth century. As a result of the initial study, Phase II NRHP eligibility testing was deemed necessary to determine if the site is eligible for inclusion in the NRHP as defined by the National Register criteria (36 CFR Part 63).

Since the 1999 archaeological investigation, the study area has been heavily disturbed. Aerial photography of the study area indicates that Culebrinas Site 1, Culebrinas Site 2, and the Iglesia de Espinar archaeological site have been severely impacted by ground disturbing activities conducted by local entities. Additional Phase I cultural resources surveys are necessary at these locations to verify the presence of intact archaeological deposits and determine National Register eligibility. The Corps is currently coordinating a Programmatic Agreement with Puerto Rico Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP). The Programmatic Agreement will outline the process in which the Corps will consult with the agencies to avoid, minimize, and mitigate adverse effects to historic properties and will be executed prior to the signing of this EA's FONSI.

### **3.5 HURRICANE MARIA STORM EFFECTS**

Hurricane Maria was the worst storm to hit Puerto Rico in over 80 years, and arrived only two weeks after Hurricane Irma passed just north of the island. Multiple media outlets

reported combined storm damages that left approximately 1 million people without power. Hurricane Maria first made landfall near the southeastern town of Yabucoa and traveled northwest across the island. The powerful Category 4 storm crossed the island with sustained winds of 155 miles per hour, which resulted in uprooted trees, downed weather stations and cell towers, and ripped wooden and tin roofs off homes. Heavy rains and flash floods brought on by the storm exacerbated widespread devastation, turning streets into rivers full of debris. In some areas, floodwaters were waist-high, more than 30 inches deep, and often sewage-ridden. Electricity was cut off to 100 percent of the island, and access to clean water and food became limited for most. Large portions of Aguadilla and Aguada were inundated by the overburdened Rio Culebrinas and Caño Madre Veija flood plains (see **Figures 6 and 7**).



**Figure 6. Caño Madre Veija flooding post-hurricane Maria in 2017.**



Figure 7. Caño Madre Veija flooding post-hurricane Maria in 2017.

## 4 ENVIRONMENTAL EFFECTS

The anticipated changes to the existing environment (including direct and indirect effects) for the No Action Alternative and Recommended Plan are included in **Table 1**. Cumulative effects are also discussed in **Tables 2** and **3** of this section.

In order to meet current Federal, state, and local laws, regulations, and policy, as well as Corps standards and guidelines, the Recommended Plan will be reviewed and potentially modified during the PED phase. If changes to the project result in effects that have not been previously evaluated, then pursuant to NEPA, the Corps will prepare a separate NEPA document to address the changes and evaluate the associated effects. The Corps and its contractors commit to avoiding, minimizing, and mitigating for adverse effects during construction activities.



**Table 1. Summary and comparison of the potential environmental consequences associated with the implementation of the No Action Alternative and Recommended Plan.**

Environmental Factor / Resource	No Action Alternative	2004 Recommended Plan	Environmental Factor / Resource
Vegetation	No effect	Construction of the levees, cutoff channel, and drainage features would lethally affect vegetation through excavation or burial; however, effects to wetland vegetation were determined to be self-mitigating.	Same as 2004 Recommended Plan; however, additional wetland impacts are anticipated due to need for levee redesign.

**Table 1. Summary and comparison of the potential environmental consequences associated with the implementation of the No Action Alternative and Recommended Plan.**

Wetlands	No effect	Project completion will directly affect approximately 1.5 acres of emergent wet prairie currently used as pasturelands. No mitigation plan was proposed for these effects.	Project completion will directly affect approximately 10.25 acres of mostly degraded wetlands within the levee right of way (formerly Coloso sugar cane fields). The Corps will mitigate for these unavoidable impacts and has proposed a conceptual mitigation plan in section 2.4 of the 2015 DPR update, which would create wetlands by excavating 13.35 acres. Since a portion of the mitigation plan's excavation would be in existing wetlands to ensure hydrologic connection, the total net creation of wetlands would be 11.69 acres. The final location, size, and configuration of the wetland mitigation areas are subject to change based on additional investigations on the elevation and character of material to be excavated as well as socio-economic considerations. The goal is (1) to achieve wetland hydrologic conditions (flooding or saturation of the soil for sufficient duration and frequency) (2) to excavate material suitable for levee construction to the extent practicable, (3) to minimize the amount of unusable excavated material needing disposal, and (4) to minimize impacts (to residential, commercial,
----------	-----------	--	---

**Table 1. Summary and comparison of the potential environmental consequences associated with the implementation of the No Action Alternative and Recommended Plan.**

Environmental Factor / Resource	No Action Alternative	2004 Recommended Plan	Environmental Factor / Resource
			recreational, and cultural interests).
Endangered and Threatened Species	No effect	No effect on any federally listed endangered or threatened species. NMFS concurred in a letter dated August 8, 1995. The 1999 USFWS CAR did not identify any endangered or threatened species or effects to critical habitat.	Construction activities may affect, but are not likely to adversely affect, the Puerto Rican boa. Standard protection measures will also be implemented to protect any boas that may occur in the area. Consultation with USFWS is on-going.
Fish and Wildlife Resources	No effect	Construction of the cutoff channel and the Aguadilla levee where it intersects Caño Madre Vieja may result in lethal effects to non-motile species in these areas due to removal and/or burial. These impacts, although lethal, are expected to be minor and temporary as recolonization from adjacent communities will occur almost immediately. Temporary displacement of wildlife during construction due to noise and/or construction activities may occur; however, these effects are expected to be minor and will cease with the completion of construction.	Same as 2004 Recommended Plan
EFH	No effect	No effect, EFH is not present in the project area.	Same as 2004 Recommended Plan

**Table 1. Summary and comparison of the potential environmental consequences associated with the implementation of the No Action Alternative and Recommended Plan.**

Environmental Factor / Resource	No Action Alternative	2004 Recommended Plan	Environmental Factor / Resource
CBRS	No effect	The project will have no effect on the CBRS units in the area. The project will not result in an increase in the development of CBRS Unit PR-75P, which has already been developed by the Municipality of Aguadilla. The project was modified to avoid working within CBRS Unit PR-75.	Same as 2004 Recommended Plan
Water Quality	No effect	The Recommended Plan should not result in violations of water quality standards. Water quality will not be adversely impacted by this project, and Commonwealth water quality standards will be met. Short-term increases in the turbidity are expected during the construction phase of the project; however, water quality is expected to quickly return to pre-construction conditions following completion of construction.	Same as 2004 Recommended Plan
HTRW	No effect	No effect	No effect

**Table 1. Summary and comparison of the potential environmental consequences associated with the implementation of the No Action Alternative and Recommended Plan.**

Environmental Factor / Resource	No Action Alternative	2004 Recommended Plan	Environmental Factor / Resource
Prime and Unique Farmland Soils	No effect	The Recommended Plan would eliminate 11.7 acres of farmland, of which 5.43 are in pasture production and approximately 1.5 acres are wet pasturelands. The remaining 33.1 acres of the project footprint was dedicated to sugar cane cultivation for over 100 years and is now used as pastureland; however, existing development confines the work area and acts as a containment berm for water flow. In a letter dated May 17, 2002, NRCS stated the draft EA clearly addressed the Farmland Protection Policy Act of 1981 and the agency has no further environmental concerns.	Same as 2004 Recommended Plan. Coordination with NRCS to address project changes is ongoing.
Air Quality	No effect	Minor, temporary degradation of air quality will occur due to emissions during construction operations as well as heavy equipment and truck haul emissions, however, air quality is expected to quickly return to pre-construction conditions following completion of construction.	Same as 2004 Recommended Plan

**Table 1. Summary and comparison of the potential environmental consequences associated with the implementation of the No Action Alternative and Recommended Plan.**

Environmental Factor / Resource	No Action Alternative	2004 Recommended Plan	Environmental Factor / Resource
Noise	No effect	A temporary increase in the noise level in the project area would occur during construction operations; however noise levels are expected to quickly return to pre-construction conditions following completion of construction.	Same as 2004 Recommended Plan
Aesthetic Resources	No effect	The structures will be incorporated into the aesthetic appearance of the area. The quality of aesthetically pleasing green areas will not be compromised by project results.	Same as 2004 Recommended Plan; equipment used for construction of the project will be visible and may be considered unsightly by members of the public, resulting in a temporary reduction in the aesthetic value in the construction area.
Recreation Resources	No effect	Recreation features were not included in the Recommended Plan, and so there are no recreation benefits associated with the project. There are also no expected adverse effects to existing recreation resources.	Same as 2004 Recommended Plan

**Table 1. Summary and comparison of the potential environmental consequences associated with the implementation of the No Action Alternative and Recommended Plan.**

Environmental Factor / Resource	No Action Alternative	2004 Recommended Plan	Environmental Factor / Resource
Socioeconomic Resources	In the future without project condition, flooding will continue to inflict damages in Aguada, Aguadilla, and Espinar. These include flood damages to residential, commercial, and public properties (as well as utilities) totaling more than \$1.15 million a year in average annual damages.	In the future with project condition (as estimated by the 2004 report) the majority of annual flood damage (about 86%) will be prevented by the project. Some residual flood damage will still occur (about \$146,000 in annual damages). Also, construction of the project will create NED employment benefits (estimated to be about \$20,000 a year). The NED benefits of the project will have secondary beneficial economic effects, including improved business and tax revenue that will contribute to regional economic development.	In the future with project condition, the majority of annual flood damage will be prevented by the project. The proportion of damages prevented by the project (and the magnitude of residual flood risk) will need to be updated during the preconstruction engineering and design phase based on updated rainfall data. Also, construction of the project will create additional NED employment benefits. The NED benefits of the project will have secondary beneficial economic effects, including improved business and tax revenue that will contribute to regional economic development. These benefits are particularly important in the current context, given that the communities in the study area are still suffering from the lingering effects of a catastrophic hurricane and economic crisis.

**Table 1. Summary and comparison of the potential environmental consequences associated with the implementation of the No Action Alternative and Recommended Plan.**

Environmental Factor / Resource	No Action Alternative	2004 Recommended Plan	Environmental Factor / Resource
Cultural Resources	No effect on cultural resources listed or eligible for listing in the NRHP.	Additional surveys are necessary to identify and evaluate cultural resources and determine effects of the Recommended Plan on historic properties.	Same as 2004 Recommended Plan. The Corps is currently coordinating a Programmatic Agreement with Puerto Rico SHPO and the ACHP. The Programmatic Agreement will outline the process in which the Corps will consult with the agencies to avoid, minimize, and mitigate adverse effects to historic properties and will be executed prior to the signing of this EA's FONSI.



**Table 1. Summary and comparison of the potential environmental consequences associated with the implementation of the No Action Alternative and Recommended Plan.**

Environmental Factor / Resource	No Action Alternative	2004 Recommended Plan	Environmental Factor / Resource
Unavoidable Adverse Environmental Effects	No effect	Project completion will directly affect approximately 1.5 acres of emergent wet prairie currently used as pasturelands. Construction of the cutoff channel and the Aguadilla levee where it intersects Caño Madre Vieja may result in lethal effects to non-motile species in these areas due to removal and/or burial. These impacts, although lethal, are expected to be minor and temporary as recolonization from adjacent communities will occur almost immediately. Temporary displacement of wildlife during construction due to noise and/or construction activities may occur; however, these effects are expected to be minor and will cease with the completion of construction. The Recommended Plan would eliminate 11.7 acres of farmland, of which 5.43 are in pasture production and approximately 1.5 acres are wet pasturelands.	Same as Recommended Plan, however, an additional 8.75 acres of wetlands would be impacted. Effects from the construction activities to fish and wildlife, including threatened and endangered species, are expected to be insignificant and temporary as the motile organisms are able to relocate and avoid direct effects. While construction will lethally affect existing vegetation in the footprint, native vegetation will be planted following completion of construction. These effects are expected to be short-term and minor.

#### 4.1 CUMULATIVE EFFECTS

Cumulative effects are defined in 40 C.F.R. §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 2**. Section 1.4 of this EA contains more details on environmental reports completed in/around the project’s vicinity. No other Federal projects exist in the project vicinity; however, the Puerto Rico Coastal Storm Risk Management and San Juan Metro Coastal Storm Risk Management studies were initiated in October 2018 and are ongoing. The purpose of these studies is to look at management measures to assist to reduce coastal storm risk along the Puerto Rican coastline. It is expected that the public, Commonwealth of Puerto Rico, and local governments could have permitted activities in or around the project area. Activities completed by the Federal government are evaluated under NEPA directly for each project. Other projects that could result in a cumulative effect, occur in-water, or would affect wetlands are evaluated under a permit issued by the Corps’ Regulatory Division and are incorporated by reference.

The implementation of the Rio Culebrinas Section 205 project, when considered with past projects in the area and potential future projects, has no significant cumulative impact on the environmental conditions of the project area. A summary of cumulative effects on environmental factors from past, present, and reasonably foreseeable actions and plans is provided in **Table 3**.

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

Past Actions/Authorized Plans	Current Actions and Operating Plans	Reasonably Foreseeable Future Actions and Plans
- General development - Agricultural activities	- No known current projects.	- No known future actions or plans.

**Table 3. Summary of cumulative effects.**

Natural Setting (Vegetation, Wetlands, Endangered and Threatened Species, Fish and Wildlife Resources, and EFH)	
<b>Past Actions</b>	Construction of residential and commercial/public infrastructure has decreased the amount of habitat available for use by wildlife and threatened and endangered species potentially in the area.
<b>Present Actions</b>	No known present actions are occurring in the project vicinity.

<b>2015 Recommended Plan</b>	Implementation of the 2015 Recommended Plan could result in temporary effects to fish, wildlife, and threatened and endangered species during construction due to noise and/or construction activities; however, these impacts are expected to be minor and will cease with the completion of construction. Non-motile species located in the levee, drainage channels, or cutoff channel footprints would be lethally effected due to excavating or fill operations. These effects, although lethal, are expected to be minor and temporary as recolonization from adjacent communities will occur almost immediately. Project completion will directly affect approximately 10.25 acres of mostly degraded wetlands within the levee right of way (formerly Coloso sugar cane fields). The Corps will mitigate for these unavoidable impacts and has proposed a conceptual mitigation plan in section 2.4 of the 2015 DPR update, which would create wetlands by excavating 13.35 acres.
<b>Future Actions</b>	Any Federal and/or state/local projects will be required to follow regulations to maintain and protect threatened and endangered species and their habitats within the area.
<b>Cumulative Effect</b>	Cumulative effects to the natural setting of this area are not anticipated.
<b>Physical Setting (CBRS, Water Quality, HTRW, Prime and Unique Farmland Soils, Air Quality, Noise)</b>	
<b>Past Actions</b>	The project area has mostly been dedicated to agriculture therefore sources of pollution, contamination, etc. are negligible.
<b>Present Actions</b>	No known present actions are occurring in the project vicinity.
<b>2015 Recommended Plan</b>	Implementation of the 2015 Recommended Plan could result in temporary minor turbidity impacts. Construction, including excavating or fill operations, of the levees, drainage structures, ramps, and/or new channel footprints could temporarily increase turbidity in surrounding waters. Construction equipment may release negligible amounts of pollutants, including oils and grease. Best management practices will be used to limit the possibility of adverse effects, and detailed pollution control plans will be developed during the design phase. Construction of the Recommended Plan would eliminate approximately 11.7 acres of farmland, of which 5.43 are in pasture production and approximately 1.5 acres are wet pasturelands.
<b>Future Actions</b>	Projects implemented would maintain and meet regulated water quality standards within the area.

<b>Cumulative Effect</b>	Ongoing seasonal weather and storm event effects on water quality are unlikely to be eliminated; however, implementation of the Recommended Plan will reduce risk of flooding. The Corps is committed to ensuring that projects will not result in violations of water quality standards. Loss of farmland is coordinated with NRCS and the public. Cumulative effects to the physical setting of this area are not anticipated.
<b>Socioeconomic Resources (Aesthetic Resources, Recreation Resources, Economic Resources)</b>	
<b>Past Actions</b>	Economic growth and development in the study area has been stable with the exception of adverse storm effects.
<b>Present Actions</b>	No known present actions are occurring in the project vicinity.
<b>2015 Recommended Plan</b>	By implementing the Recommended Plan, flood damage in the project area will be reduced which will positively affect socioeconomic resources in this area.
<b>Future Actions</b>	As the economy continues to recover from storm effects of Hurricane Maria, additional economic growth and development will likely occur.
<b>Cumulative Effect</b>	Continuation of benefits to socioeconomic resources may be anticipated when considering the cumulative effects of projects in this area.
<b>Cultural Resources</b>	
<b>Past Actions</b>	Construction of residential and commercial/public infrastructure has likely severely impacted known cultural resources within the area.
<b>Present Actions</b>	No known present actions are occurring in the project vicinity.
<b>2015 Recommended Plan</b>	The Corps is currently coordinating a Programmatic Agreement with Puerto Rico SHPO and the ACHP. The Programmatic Agreement will outline the process in which the Corps will consult with the agencies to avoid, minimize, and mitigate adverse effects to historic properties and will be executed prior to the signing of this EA's FONSI.
<b>Future Actions</b>	Any Federal and/or state/local projects will be required to follow regulations to avoid, minimize, or mitigate impacts to cultural resources within the area.
<b>Cumulative Effect</b>	With the implementation of the programmatic agreement, no cumulative effects to the cultural resources are expected.

## **5 PUBLIC AND AGENCY COORDINATION**

A Notice of Availability for the EA and Proposed FONSI will be coordinated with pertinent agencies and interested stakeholders for a 60-day review and comment period. The project will be in compliance with the NEPA of 1969, as amended, 42 U.S.C. 4321, *et seq.* Public Law 91-190.

### **5.1 COMMENTS RECEIVED AND CORPS' RESPONSES**

Comments received during the 30-day agency review and public comment period will be addressed in the EA/FONSI. **Appendix D (Public and Agency Project Comments)** will include a list of the comments received and the Corps' responses.

## 6 ENVIRONMENTAL COMMITMENTS AND COMPLIANCE

The Corps will comply with all terms and conditions of agency consultations and/or permits. The Corps and its contractors also commit to avoiding and minimizing for adverse effects during construction activities by including the commitments in **Table 4** in the contract specifications:

**Table 4. Corps' environmental commitments.**

Environmental Commitment	Corps' Commitment
Protection of Fish and Wildlife Resources	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.
Endangered and Threatened Species Protection	Adverse effects to endangered and threatened species will be avoided and/or minimized. The Corps will include the USFWS standard protection measures for the Puerto Rican boa in the project plans and specifications to protect any boas that may be in the area. Endangered and threatened 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 and reduce turbidity impacts. All wastes and refuse generated by project construction will be removed and properly disposed. Excavation will produce fill for levee construction; however, best management practices for containment will be implemented. Contractors will implement a spill contingency plan for hazardous, toxic, or petroleum material. Conditions imposed by the water quality certification will be implemented in order to minimize adverse impacts to water quality.
Cultural Resources	Pursuant to 54 U.S.C. 306108 § 800.14, the Corps is conducting a phased identification and evaluation of historic properties. The Corps is currently coordinating a Programmatic Agreement with Puerto Rico SHPO and the ACHP. The Programmatic Agreement will outline the process in which the Corps will consult with the agencies to avoid, minimize, and mitigate adverse effects to historic properties and will be executed prior to the signing of this EA's FONSI. In addition, an unexpected cultural resources finds clause will be included in the project specifications. In the event of an archaeological resource discovery, work in the area will be suspended at the site until compliance with all federal and state regulations is successfully completed and Corps staff members provide further directive.

Environmental Commitment	Corps' Commitment
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.

This EA has been prepared pursuant to NEPA and its implementing regulations. The status of the proposed project's compliance with environmental acts and E.O. are provided in **Table 5**:

**Table 5. Proposed project's environmental act and E.O. compliance status.**

Environmental Act or E.O.	Project Compliance Status
National Environmental Policy Act of 1969 (42 U.S.C. §4321 <i>et seq.</i> )	This EA has been prepared pursuant to NEPA and its implementing regulations. A Notice of Availability for the EA and Proposed FONSI will be coordinated with pertinent agencies and interested stakeholders for a 60-day review and comment period. In order to meet current Federal, state, and local laws, regulations, and policy, as well as Corps standards and guidelines, the Recommended Plan will be reviewed and potentially modified during the PED phase. If changes to the project result in effects that have not been previously evaluated, then pursuant to NEPA, the Corps will prepare a separate NEPA document to address the changes and evaluate the associated effects. The Corps and its contractors commit to avoiding, minimizing, and mitigating for adverse effects during construction activities. The project complies with this Act.
Endangered Species Act of 1973 (16 U.S.C. §1531 <i>et seq.</i> )	The project was coordinated with NMFS and USFWS through the 2004 EA and will be coordinated again during the public review of this NEPA document. The Corps has determined that implementation of the 2015 Recommended Plan may affect, but will not adversely affect the Puerto Rican boa ( <i>Epicrates inornatus</i> ). In addition, the Corps has determined that the project would have no effect on listed species under NMFS' purview. Coordination with the agencies to address project changes is ongoing. Pertinent correspondence is found in Appendix A. The project will comply with this Act prior to the signing of this EA's FONSI.

Environmental Act or E.O.	Project Compliance Status
Fish and Wildlife Coordination Act of 1958 (16 U.S.C. §661 <i>et seq.</i> )	A Coordination Act Report was prepared for the Rio Culebrinas Section 205 project in 1999. A Memorandum for the Record, found in Appendix A (Project Correspondence), will be signed by USFWS and the Corps to document an agreement between the agencies to use the NEPA review and endangered species act consultation processes to complete coordination responsibilities under the Fish and Wildlife Coordination Act. Funds may be sent to the USFWS during the PED phase to provide support during design refinements. The project will comply with this Act prior to the signing of this EA's FONSI.
National Historic Preservation Act of 1966 ( <i>Inter Alia</i> )	The Corps has initiated consultation for the Recommended Plan with the Puerto Rico SHPO pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and consideration given under NEPA. The Corps is currently coordinating a Programmatic Agreement with Puerto Rico SHPO and the ACHP. The Programmatic Agreement will outline the process in which the Corps will consult with the agencies to avoid, minimize, and mitigate adverse effects to historic properties and will be executed prior to the signing of this EA's FONSI.
Clean Water Act of 1972, Section 401 and Section 404(B) (33 U.S.C. §1341 <i>et seq.</i> and 33 U.S.C. §1344(b) <i>et seq.</i> )	The 2004 EA included a Section 404(b)(1) Guidelines Evaluation. The project was determined to be consistent with the program. The Corps will seek WQC from the Commonwealth of Puerto Rico to be in compliance with the Clean Water Act and Commonwealth standards in effect for the Clean Water Act.
Clean Air Act of 1972 (42 U.S.C. §7401 <i>et seq.</i> )	No air quality permits are required for this project. Because the project is located within an attainment area, USEPA General Conformity Rule to implement Section 176(c) of the Clean Air Act does not apply and a conformity determination is not required.
Coastal Zone Management Act of 1972 (16 U.S.C. §1451 <i>et seq.</i> )	A Federal Consistency Determination will be submitted to the Puerto Rico Planning Board for the Commonwealth of Puerto Rico's review and concurrence. The project will comply with this Act prior to the signing of this EA's FONSI.
Farmland Protection Policy Act of 1981 (7 U.S.C. §4201 <i>et seq.</i> )	Coordination with the NRCS was completed in 2002 for effects to prime and/or unique farmland affected by implementation of this project. Coordination with NRCS to address project changes is ongoing. Pertinent correspondence is included in Appendix A. The project will comply with this Act.
Wild and Scenic River Act of 1968 (16 U.S.C. §1271 <i>et seq.</i> )	This project will not affect any designated wild and scenic river reaches. This Act is not applicable.



<b>Environmental Act or E.O.</b>	<b>Project Compliance Status</b>
Marine Mammal Protection Act of 1972 (16 U.S.C. §1361 <i>et seq.</i> )	No marine mammals will be affected by this project. This Act is not applicable.
Estuary Protection Act of 1968 (16 U.S.C. §§1221-26)	No estuaries will be affected by this project. This Act is not applicable.
Federal Water Project Recreation Act (16 U.S.C. §460(L)(12)-460(L)(21) <i>et seq.</i> )	Recreational resources and opportunities are discussed in Section 4 of this report. The project complies with this Act.
Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended (16 U.S.C. §1801 <i>et seq.</i> )	The project was coordinated with NMFS through the 2004 EA and will be coordinated again during the public review of this NEPA document. The Corps determined the proposed work occurs inland and would not affect EFH under the jurisdiction of NMFS. In a letter dated August 4, 1999 NMFS stated it had no comments or recommendations to offer on the project. The project complies with this Act.
Submerged Lands Act of 1953 (43 U.S.C. § 1301 <i>et seq.</i> )	No submerged navigable lands will be affected by implementation of the project. This Act is not applicable.
Coastal Barrier Resources Act and Coastal Barrier Improvement Act of 1990 (16 U.S.C. §3501 <i>et seq.</i> )	The project will have no effect on the CBRS units in the area. The project will not result in an increase in the development of CBRS Unit PR-75P, which has already been developed by the Municipality of Aguadilla. The project was modified to avoid working within CBRS Unit PR-75. The project complies with this Act.
Rivers and Harbors Act of 1899, Section 10 (33 U.S.C. §403 <i>et seq.</i> )	The proposed work will not obstruct navigable waters of the U.S. The project complies with this Act.
Anadromous Fish Conservation Act (16 U.S.C. §§757A-757G)	The project will have no effect on anadromous fish species. The project complies with this Act.
Migratory Bird Treaty Act (16 U.S.C. §§703-712) and Migratory Bird Conservation Act (16 U.S.C. §§715-715D, 715E, 715F-715R)	The project plans and specifications will include migratory bird protection measures for construction activities. If nesting activities occur within the construction area, appropriate buffers will be placed around nests to ensure their protection. The project was coordinated with USFWS and complies with these Acts.
Marine Protection, Research, and Sanctuaries Act (16 U.S.C. §1431 <i>et seq.</i> AND 33 U.S.C. §1401 <i>et seq.</i> )	Ocean disposal is not a component of this project. This Act is not applicable.
Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. §4601 <i>et seq.</i> )	The NFS will be responsible for acquiring any real estate interests for the project. The Corps will work with the NFS to ensure compliance with this Act. The project will comply with this Act.

Environmental Act or E.O.	Project Compliance Status
E.O. 11988, Flood Plain Management	The Corps concludes that the proposed project 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 will result in a reduction of flood damages. The project complies with this Order.
E.O. 11990, Protection of Wetlands	Project completion will directly affect approximately 10.25 acres of mostly degraded wetlands. The Corps will mitigate for these unavoidable impacts and has proposed a conceptual mitigation plan in section 2.4 of the 2015 DPR update, which would create wetlands by excavating 13.35 acres. Since a portion of the mitigation plan's excavation would be in existing wetlands to ensure hydrologic connection, the total net creation of wetlands would be 11.69 acres. The final location, size, and configuration of the wetland mitigation areas are subject to change based on additional investigations on the elevation and character of material to be excavated as well as socio-economic considerations. The project complies with this Order.
E.O. 12898, Environmental Justice	Detailed analysis of the project's environmental justice status is found in Appendix B (Environmental Justice Analysis). The project will result in temporary impacts related to noise, air quality, water quality, and use of the project staging area during construction of the project. These temporary effects would cease with construction completion and are not considered to be long-term adverse effects. The project will result in long-term positive effects to the project area. Benefits of the project include the reduction of existing and future flood damages to the nearby neighborhoods. This project will not cause any disproportionate and adverse effects to minority or low income populations. The project is in compliance with this Order.
E.O. 13045, Protection of Children from Environmental Health Risks and 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 this Order.
E.O. 13089, Coral Reef Protection	No corals or hardbottom habitat exists within the project area. The project complies with this Order.
E.O. 13112, Invasive Species	The Recommended Plan will not introduce or promote the introduction of non-species to the region. Planting of native species will result in a decrease of habitat availability for invasive/exotic species. The project complies with this Order.

Environmental Act or E.O.	Project Compliance Status
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 Corps and USFWS concerning migratory birds. Neither the Department of Defense MOU nor the Corps' Draft MOU clearly address migratory birds on lands not owned or controlled by the Corps. For many Corps' 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 reference. The Corps 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 this Order.

## 7 LIST OF PREPARERS

Name	Organization	Expertise	Role in Preparation
Kristen Donofrio, Biologist	Corps	NEPA/Biologist	Primary Author
Richard Butler, Water Quality Specialist	Corps	Water Quality	Contributing Author
Meredith Moreno, Senior Archeologist	Corps	Cultural and Native American Resources	Contributing Author
Colin Rawls Economist	Corps	Socioeconomics	Contributing Author
Terri Jordan-Sellers, Senior Biologist	Corps	NEPA/Senior Biologist	Document Reviewer
Mike Hollingsworth, Senior Water Quality Specialist	Corps	Water Quality	Document Reviewer
Andy LoSchiavo, Restoration and Resources Section Chief	Corps	Supervisory Biologist	Document Reviewer
Kevin Wittmann, Deputy Chief of Planning Jacksonville District/Chief of Economics South Atlantic Region	Corps	Socioeconomics	Document Reviewer
Jason Spinning, Coastal Section Chief	Corps	Supervisory Biologist	Document Reviewer
Dr. Gina Paduano-Ralph, Environmental Branch Chief	Corps	Supervisory Biologist	Document Reviewer
Rebecca Onchaga, Tech Writer/Editor	Corps	Technical Editor	Technical Edits

## 8 ACRONYM LIST

BBA	Bipartisan Budget Act of 2018
C.F.R.	Code of Federal Regulations
CAP	Continuing Authorities Program
CBRS	Coastal Barrier Resource System
CEQ	Council on Environmental Quality
Corps	U.S. Army Corps of Engineers
DPR	Detailed Project Report
E.O.	Executive Order
EA	Environmental Assessment
EFH	Essential Fish Habitat
EJ	Environmental Justice
EPP	Environmental Protection Plan
FONSI	Finding of No Significant Impact
HTRW	Hazardous, Toxic, and Radioactive Waste
MOU	Memorandum of Understanding
NED	National Economic Development
NEPA	National Environmental Policy Act
NFS	Non-Federal Sponsor
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
PED	Preconstruction Engineering and Design
SHPO	Puerto Rico State Historic Preservation Officer
U.S.	United States
U.S.C.	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WQC	Water Quality Certification

## 9 REFERENCES

U.S. Army Corps of Engineers (Corps). 2004. Rio Culebrinas at Aguada and Aguadilla, Puerto Rico, Section 205 Detailed Project Report and Environmental Assessment. Jacksonville, Florida.

U.S. Army Corps of Engineers (Corps). 2015. Rio Culebrinas Aguadilla-Aguada, Puerto Rico, Section 205 Continuing Authorities Program Flood Damage Reduction Project, Detailed Project Report Addendum. Jacksonville, Florida.

U.S. Army Corps of Engineers (Corps). 2019. Draft Rio Culebrinas Aguadilla-Aguada, Puerto Rico, Section 205 Flood Risk Reduction, Continuing Authorities Program Conversion Report. Jacksonville, Florida.

U.S. Fish and Wildlife Services (USFWS). 1999. Culebrinas River Flood Control Project. Coordination Act Report. Boqueron, Puerto Rico.