APPENDIX D: PERTINENT CORRESPONDENCE

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APPENDIX D.1 ENDANGERED SPECIES ACT PERTINENT CORREPONDENCE

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D.1 Endangered Species Act Pertinent Correspondence

This appendix contains pertinent correspondence related to the Central Everglades Planning South (CEPP South) features and the Endangered Species Act (ESA). A brief description of pertinent correspondence is provided below.

ESA Consultation

- January 23, 2020: U.S. Army Corps of Engineers (Corps) Biological Assessment for CEPP South
- March 17, 2020: Corps Request for Concurrence on Species Effect Determination for the Eastern Black Rail
- April 14, 2020: U.S. Fish and Wildlife Service (USFWS) Request for Additional Information on CEPP South BA
- May 8, 2020L Corps Response to April 14, 2020 Request for Additional Information on CEPP South BA

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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BLVD
JACKSONVILLE, FL 32207-8175

Planning and Policy Division
Environmental Branch

JAN 23 2020

Mr. Larry Williams, Field Supervisor
U.S. Fish and Wildlife Service
1339 20th Street
Vero Beach, FL 32960

Dear Mr. Williams:

In accordance with provisions of Section 7 of the Endangered Species Act (ESA) of 1973, as amended, the U.S. Army Corps of Engineers, Jacksonville District (Corps), is hereby reinitiating consultation with the U.S. Fish and Wildlife Service (USFWS) concerning the Central Everglades Planning Project (CEPP) south components (CEPP South). Further ESA consultation on CEPP South is required by the 2014 Programmatic Biological Opinion (BO) from the USFWS. The purpose of the CEPP is to improve the quantity, quality, timing and distribution of water flows to the Northern Estuaries (St. Lucie and Caloosahatchee), central Everglades (Water Conservation Area 3 [WCA 3] and Everglades National Park [ENP]), and Florida Bay while increasing water supply for municipal and agricultural users. Due to the size and complexity of CEPP, project implementation will involve the integration of multi-year construction through individual Project Partnership Agreements (PPAs) between the Corps and the South Florida Water Management District (SFWMD). The CEPP South Validation Report confirmed project components, construction sequencing, and project dependencies as identified in the 2014 CEPP Final Project Implementation Report and Environmental Impact Statement (2014 CEPP PIR/EIS) and was approved by the Corps' South Atlantic Division on May 31, 2019. The Jacksonville District, plans to proceed with advertisement and award of the first construction contract for CEPP South in July and September 2020, respectively. A final CEPP South BO is needed for execution of the PPA by June 2020. The signed PPA is required to advertise and award the first construction contract for CEPP South.

The full consultation history for CEPP South is included in Section 2 of the attached Biological Assessment (BA). The Corps is reinitiating consultation with the USFWS on CEPP South based on coordination in 2019 with the USFWS, in which the USFWS agreed that once the Corps completed modeling for the proposed Combined Operational Plan (COP) and selected a preliminary preferred plan, the Corps would update and resubmit the CEPP South BA. The COP will define operations for the constructed features of the Modified Water Deliveries (MWD) to ENP and C-111 South Dade Projects, and implementation of the COP is anticipated in August 2020. As such, the COP will define operations for water management infrastructure in the study area and serve as the baseline for initial water management operations in the CEPP South project area. The COP will also provide an overall constraint regarding the volume of flows into Eastern ENP by limiting the maximum operating stage in the L-29 Canal (between S-333 and S-

334) based on the completed MWD Tamiami Trail roadway modifications. Consultation for the COP was initiated on December 11, 2019 with submittal of a BA.

Species effects determinations for all federally listed threatened and endangered species for those that fall within the CEPP South action area are listed in Table 1. The Corps reaffirms the 2018 CEPP South BA species effects determinations for the following listed species: the Florida panther (*Puma concolor coryi*), West Indian manatee (*Trichechus manatus*) and its critical habitat, the Florida bonneted bat (*Eumops floridanus*), American alligator (*Alligator mississippiensis*), American crocodile (*Crocodylus acutus*) and its critical habitat, Eastern indigo snake (*Drymarchon corais couperi*), the piping plover (*Charadrius melodus*), the red-cockaded woodpecker (*Picoides borealis*), the roseate tern (*Sterna dougallii*), the Miami blue butterfly *(Cyclargus thomasi bethunebakeri)*, the Schaus swallowtail butterfly (*Heraclides aristodemus ponceanus*), the Stock Island tree snail (*Orthalicus reses (not incl. nesodryas)*), the crenulate lead-plant (*Amorpha crenulata*), the Okeechobee gourd *(Cucurbita okeechobeensis ssp. Okeechobeenis*), the Big Pine partridge pea (*Chamaecrista lineata var. keyensis*), the Cape Sable thoroughwort (*Chromolaena frustrata*), Carters small-flowered flax (*Linum carteri var. carteri*), the Florida brickell-bush (*Brickellia mosieri*), the Florida bristle-fern (*Trichomanes punctatum spp. floridanum*), the Florida semaphore cactus *(Consolea corallicola*), and the sand flax (*Linum arenicola*). The USFWS provided concurrence on these species determinations in correspondence dated December 21, 2018.

The Corps has changed its effect determinations from the 2018 CEPP South BA for the following listed species based on new information regarding the presence of these species in the action area: the deltoid spurge (*Chamaesyce deltoidea spp. deltoidea*), the Garber's spurge (*Chamaesyce garberi*), the Small's milkpea (*Galactia smallii*), the tiny polygala (*Polygala smallii*), Bartram's hairstreak butterfly (*Strymon acis bartrami*), the Florida leafwing butterfly (*Anaea troglodyte floridalis*), Blodgett's silverbush (*Argythamnia blodgettii),* Everglades bully (*Sideroxylon reclinatum spp. Austrofloridense*), Florida pineland crabgrass (*Digitaria pauciflora*), the Florida prairie-clover *(Dalea carthagenesis floridana*), and sandmat (*Chaemaesyce deltoidea pinetorium*). Furthermore, the Corps is requesting formal consultation on the Everglade snail kite (*Rostrhamus sociabilis plumbeus)*, the Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*), and the wood stork (*Mycteria americana*), and is requesting that incidental take be provided for these species as applicable.

The Corps acknowledges the potential usage and occurrence of threatened and endangered species and/or critical habitat within the CEPP South action area. Completion of a revised Draft Project Operating Manual (DPOM) for CEPP South and supporting National Environmental Policy Act documentation is anticipated to be complete by July 2020. If the DPOM shows CEPP South will have effects to listed species or critical habitat in a manner or an extent not considered in the enclosed 2020 CEPP South BA, the Corps will reinitiate ESA consultation as appropriate under 50 CFR §402.16. We request that the USFWS provide concurrence on the Corps species effect determinations in Table 1, provide a Draft BO within 90 days of receipt of this letter for Corps' review, and provide a Final BO within 135 days from receipt of this letter. Please contact Melissa Nasuti by email:

Melissa.a.nasuti@usace.army.mil or telephone 904-232-1368 regarding this consultation request.

Sincerely,

Angela Dunn
Chief, Environmental Branch

Enclosure

cc:
Mr. Donald Progulske, U.S. Fish and Wildlife Service, 1339 20th Street, Vero Beach, Florida 32960
Mr. Miles Meyer, U.S. Fish and Wildlife Service, 1339 20th Street, Vero Beach, Florida 32960
Mr. Kevin Palmer, U.S. Fish and Wildlife Service, 1339 20th Street, Vero Beach, Florida 32960

Table 1. Status of Federally Threatened and Endangered Species under USFWS Jurisdiction with the Potential to occur within the CEPP South Action Area and the Corps' Effects Determination (E: Endangered; T: Threatened; SA: Similarity of Appearance; CH: Critical Habitat, C: Candidate Species)

Common Name	Scientific Name	Status	May Affect Not Likely to Adversely Affect	May Affect	No Effect
Mammals					
Florida panther	*Puma concolor coryi*	E	X		
Florida manatee	*Trichechus manatus latirostris*	E, CH	X		
Florida bonneted bat	*Eumops floridanus*	E	X		
Birds					
Cape Sable seaside sparrow	*Ammodramus maritimus mirabilis*	E, CH		X	
Everglade snail kite	*Rostrhamus sociabilis plumbeus*	E, CH		X	
Piping plover	*Charadrius melodus*	T			X
Red-cockaded woodpecker	*Picoides borealis*	E			X
Roseate tern	*Sterna dougallii*	T			X
Wood stork	*Mycteria americana*	T		X	
Reptiles					
American Alligator	*Alligator mississippiensis*	T, SA	X		
American crocodile	*Crocodylus acutus*	T, CH	X		
Eastern indigo snake	*Drymarchon corais couperi*	T	X		
Gopher tortoise	*Gopherus polyphemus*	C			X
Invertebrates					
Bartram's hairstreak butterfly	*Strymon acis bartrami*	E, CH	X		
Florida leafwing butterfly	*Anaea troglodyta floridalis*	E, CH	X		
Miami blue butterfly	*Cyclargus thomasi bethunebakeri*	E			X
Schaus swallowtail butterfly	*Heraclides aristodemus ponceanus*	E			X

Stock Island tree snail	*Orthalicus reses (not incl. nesodryas)*	T			X
Plants					
Crenulate lead plant	*Amorpha crenulata*	E			X
Deltoid spurge	*Chamaesyce deltoidea spp. deltoidea*	E			X
Garber's spurge	*Chamaesyce garberi*	T	X		
Okeechobee gourd	*Cucurbita okeechobeensis ssp. okeechobeenis*	E			X
Small's milkpea	*Galactia smallii*	E	X		
Tiny polygala	*Polygala smallii*	E	X		
Big pine partridge pea	*Chamaecrista lineata var. keyensis*	E			X
Blodgett's silverbush	*Argythamnia blodgettii*	T	X		
Cape Sable thoroughwort	*Chromolaena frustrata*	E, CH			X
Carter's small-flowered flax	*Linum carterivar. carteri*	E, CH			X
Everglades bully	*Sideroxylon reclinatum spp. austrofloridense*	T	X		
Florida brickell-bush	*Brickellia mosieri*	E, CH			X
Florida bristle fern	*Trichomanes punctatum spp. floridanum*	E			X
Florida pineland crabgrass	*Digitaria pauciflora*	T	X		
Florida prairie-clover	*Dalea carthagenesis floridana*	E	X		
Florida semaphore cactus	*Consolea corallicola*	E, CH			X
Pineland sandmat	*Chaemaesyce deltoidea pinetorium*	T	X		
Sand flax	*Linum arenicola*	E			X

2020 Biological Assessment

Central Everglades Planning Project (CEPP) South

Prepared by: U.S. Army Corps of Engineers, Jacksonville District

Submitted to: United States Fish and Wildlife Service, Vero Beach Ecological Services Office, Vero Beach, Florida

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Table of Contents

1 INTRODUCTION 1

2 CONSULTATION SUMMARY 2

2.1 Consultation 2014 CEPP Final PIR/EIS 2

2.2 Consultation Summary CEPP South 3

3 STUDY AREA 5

4 CEPP SOUTH PROJECT DESCRIPTION 7

4.1 CEPP SOUTH PLAN FEATURES 7

4.2 Project Authority 19

4.3 Project Goal, Objectives, Constraints 19

5 PERFORMANCE MEASURES 20

6 DESCRIPTION OF EXISTING CONDITIONS, LISTED SPECIES AND DESIGNATED CRITICAL HABITAT 21

6.1 Affected Environment 21

6.2 Designated Critical Habitat 32

6.3 Effects Determinations 43

7 CUMULATIVE EFFECTS 91

8 CONSERVATION MEASURES 95

9 CONCLUSIONS 96

10 REFERENCES 98

List of Tables

TABLE 1. CEPP PROJECT FEATURES BY IMPLEMENTATION PHASE 8

TABLE 2. GOALS AND OBJECTIVES OF CEPP. GOALS AND OBJECTIVES FOR CERP ARE ALSO DEPICTED TO ACKNOWLEDGE THE DIRECT LINKAGE BETWEEN THE TWO PROJECTS. . 20

TABLE 3. STATUS OF FEDERALLY THREATENED AND ENDANGERED SPECIES UNDER USFFWS' JURISDICTION WITH THE POTENTIAL TO OCCUR WITHIN THE CEPP SOUTH ACTION AREA AND THE CORPS' EFFECTS DETERMINATION (E: ENDANGERED; T: THREATENED; SA: SIMILARITY OF APPEARANCE; CH: CRITICAL HABITAT, C: CANDIDATE SPECIES) 28

TABLE 4. PANTHER HABITAT IMPACTS FOR CEPP SOUTH FEATURES BASED ON PANTHER HABITAT UNIT VALUES* INCLUDING IMPLEMENTATION OF AMMP COMPONENTS 46

TABLE 5. CAPE SABLE SEASIDE SPARROW BIRD COUNT AND POPULATION ESTIMATES BY YEAR AS RECORDED BY THE EVERGLADES NATIONAL PARK RANGE-WIDE SURVEY (Data Source USFWS September 18, 2019 Leadership Group Meeting) 60

TABLE 6. ACREAGE OF UPLAND LOST AND UPLAND CREATION UNDER CEPP SOUTH. 71

TABLE 7. PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS AND PLANS AFFECTING THE ACTION AREA....92
TABLE 8. SUMMARY OF CUMULATIVE EFFECTS....93

List of Figures

FIGURE 1. MAP OF STUDY AREA....6
FIGURE 2. CEPP RECOMMENDED PLAN SOUTHERN DISTRIBUTION AND CONVEYANCE FEATURES AND LOCATION (USACE 2014)....9
FIGURE 3. CEPP RECOMMENDED PLAN SOUTHERN DISTRIBUTION AND CONVEYANCE FEATURES AND LOCATION (USACE 2014) INCLUDING LOCATION OF COMPLETE BACKFILL OF EAST WEST AGRICULTURL DITCH IDENTIFIED WITH THE RED CIRCLE. THE HORIZONTAL EAST WEST BLACK LINE SHOWS THE EXTENT OF BACKFILL ANTICIPATED UNDER CONTRACT 1 FOR CEPP SOUTH....15
FIGURE 4. LOCATION OF POTENTIAL ACTIVE MARSH IMPROVEMENT IN THE BLUE SHANTY FLOWWAY IN WCA 3B....16
FIGURE 5. LOCATION OF FEDERALLY THREATENED AND ENDANGERED SPECIES WITH THE POTENTIAL TO OCCUR WITHIN THE CEPP SOUTH ACTION AREA....31
FIGURE 6. CRITICAL HABITAT FOR THE FLORIDA MANATEE....33
FIGURE 7. CRITICAL HABITAT FOR THE CAPE SABLE SEASIDE SPARROW....35
FIGURE 8. CRITICAL HABITAT FOR THE EVERGLADE SNAIL KITE....37
FIGURE 9. CRITICAL HABITAT FOR THE AMERICAN CROCODILE....39
FIGURE 10. CRITICAL HABITAT FOR BARTRAM'S HAIRSTREAK BUTTERFLY....41
FIGURE 11. CRITICAL HABITAT FOR THE FLORIDA LEAFWING BUTTERFLY....42
FIGURE 12. FLORIDA PANTHER ZONES IN SOUTH FLORIDA....48
FIGURE 13. FLORIDA PANTHER TELEMETRY INFORMATION (1981-2017)....49
FIGURE 14. WEST INDIAN MANATEE CENTRAL AND SOUTH FLORIDA ACCESSIBILITY....52
FIGURE 15. FLORIDA BONNETED BAT CONSULTATION AREA....55
FIGURE 16. CAPE SABLE SEASIDE SPARROW SUBPOPULATIONS (A-F) AND DESIGNATED CRITICAL HABITAT UNITS (U1-U5). CSSS-AX IS ILLUSTRATED ADJACENT TO CSSS-A HIGHLIGHTED IN GREEN....59

1 INTRODUCTION

The purpose of a Biological Assessment (BA) is to evaluate the potential effects of a federal action on both listed species and those proposed for listing, including designated and proposed critical habitat, and determine whether the continued existence of any such species or habitat is likely to be adversely affected by the federal action. The BA is also used in determining whether formal consultation or a conference is necessary. See 50 CFR 402.12(a). This is achieved by:

- Reviewing the results of an on-site inspection of the area affected by the federal action to determine if listed or proposed species are present or occurs seasonally.
- Reviewing the views of recognized experts on the species at issue and relevant literature.
- Analyzing the effects of the federal action on species and habitat including consideration of cumulative effects, and the results of any related studies.
- Analyzing alternative actions considered by the federal agency for the proposed action.

In accordance with provisions of Section 7 of the Endangered Species Act (ESA) of 1973, as amended, the U.S. Army Corps of Engineers, Jacksonville District (Corps) via preparation of this BA is re-initiating consultation with the U.S. Fish and Wildlife Service (USFWS) regarding the Central Everglades Planning Project (CEPP). The Corps has completed a Validation Study for the CEPP South component (CEPP South) which was approved by the South Atlantic Division on May 31, 2018 The CEPP South Validation Study confirmed project components, construction sequencing, and project dependencies as identified in the 2014 CEPP Final Project Implementation Report and Environmental Impact Statement (PIR/EIS) and Chief's Report (USACE 2014). The specific features of the CEPP Recommended Plan to be implemented in CEPP South will include conveyance features that function to deliver and re-distribute existing water from Water Conservation Area 3A (WCA 3A) to WCA 3B, Everglades National Park (ENP) and Florida Bay. Further ESA Section 7 consultation on CEPP South components is needed as required by the 2014 CEPP Chief Report and 2014 Programmatic Biological Opinion (BO) from the USFWS. The Corps has prepared a BA that identifies potential effects on listed species, including designated and proposed critical habitat, pertaining to the construction and operation of those features identified in the CEPP South Validation Study and components of the CEPP Adaptive Management and Monitoring Plan (AMMP) that are pertinent to proceed with at this time. This BA will also determine whether the continued existence of any listed species or habitat is likely to be adversely affected by the action.

The Corps plans to proceed with advertisement and award of the first construction contract for CEPP South in July and September 2020, respectively. A final CEPP South BO is needed for execution of a Project Partnership Agreement (PPA) with the South Florida Water Management District (SFWMD) by June 2020. The signed PPA is required to award the first construction contract for CEPP South. The Corps is reinitiating consultation with the USFWS on CEPP South based on coordination in 2019, in which the USFWS agreed that once the Corps completed modeling for the proposed Combined Operational Plan (COP) and selected a preliminary preferred plan, the Corps would update and resubmit this CEPP South BA. Reference **Section 2** for further detailed information. The COP will define operations for the constructed features of the Modified Water Deliveries (MWD) to Everglades National Park (ENP) and Canal 111 (C-111) South Dade Projects. As such, COP will define operations for water management infrastructure in the study area and serve as the baseline for initial water management operations in the

CEPP South project area. Consultation for the COP was initiated on December 11, 2019 with submittal of a BA. The Corps anticipates a Record of Decision (ROD) will be completed for the COP in August of 2020.

2 CONSULTATION SUMMARY

2.1 Consultation 2014 CEPP Final PIR/EIS

Coordination with the USFWS and National Marine Fisheries Service (NMFS) on CEPP occurred during development of the 2014 CEPP Final PIR/EIS (USACE 2014). The Corps requested concurrence from the USFWS on federally listed species and critical habitat that may be present in the project area in a letter dated January 23, 2013. The USFWS provided concurrence on the species list on May 10, 2013. Formal consultation was initiated with the USFWS on August 5, 2013 with completion of a BA for CEPP. The Corps received a Request for Additional Information (RAI) from USFWS on September 4, 2013. The Corps provided a Supplemental Technical Analysis in Response to USFWS' RAI for CEPP on October 24, 2013. On December 13, 2013, the Corps changed its request from formal to early consultation. The Corps entered formal consultation with USFWS on the Everglade snail kite (*Rostrhamus sociabilis plumbeus*), and its designated critical habitat, Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*), (CSSS) and its designated critical habitat, the wood stork (*Mycteria americana*) and eastern indigo snake (*Drymarchon corais couperi*). A Programmatic BO was received on April 9, 2014, which stated that further consultation will be needed when more specific project details are finalized during the Project Preconstruction, Engineering, and Design (PED) phase. While the 2014 Programmatic BO did not provide provisions for incidental take of these three endangered avian species (CSSS, snail kite, and wood stork), it did describe the anticipated effects based on current information. It was recognized that, upon completing ESA Section 7 consultation for each implementation phase, the Corps would undertake the agreed-to avoidance and minimization measures and implement any required terms and conditions (TCs). When the Corps is closer to constructing portions of CEPP that will affect listed species, it was recognized that the USFWS will provide separate consultation document(s) which may authorize incidental take, and provide applicable reasonable and prudent measures (RPMs) and TCs. The preliminary conclusion from the 2014 Programmatic BO stated that the proposed project is not likely to jeopardize the continued existence of the species listed above and is not likely to adversely modify critical habitat, where designated. The 2014 Programmatic BO concurred with the Corps' determination of may affect, but is not likely to adversely affect the Florida panther (*Puma concolor coryi*), West Indian manatee (*Trichechus manatus*), and its critical habitat, American alligator (*Alligator mississippiensis*), American crocodile (*Crocodylus acutus*) and its critical habitat, deltoid spurge (*Chamaesyce deltoidea ssp. deltoidea*), Garber's spurge (*Chamaesyce garberi*), Small's milkpea (*Galactia smallii*), and tiny polygala (*Polygala smallii*). Furthermore, the USFWS concurred with all the "No Effect" determinations made by the Corps in regard to the applicable threatened or endangered species that are found in the action area. These included "No Effect" determinations for the Florida bonneted bat (*Eumops floridanus*), Northern crested caracara (*Caracara cheriway*), piping plover (*Charadrius melodus*), red-cockaded woodpecker (*Picoides borealis*), roseate tern (*Sterna dougallii dougallii*), Schaus swallowtail butterfly (*Heraclides aristodemus ponceanus*), Stock Island tree snail (*Orthalicus reses [not incl. nesodryas*]), Miami blue butterfly (*Cyclargus thomasi bethunebaker*), Beach jacquemonia (*Jacquemontia reclinata*), Cape Sable thoroughwort (*Chromolaena frustrata*), crenulate lead-plant (*Amorpha crenulata*), and Okeechobee gourd (*Cucurbita okeechobeensis ssp. okeechobeenis*).

At the time of the 2014 Programmatic BO, the following species were being proposed as candidates for listing: the Big Pine partridge pea (*Chamaecrista lineata var. keyensis*), Blodgett's silverbush (*Argythamnia blodgettii*), Carters small flowered flax (*Linum carteri var. carteri*), Everglades bully (*Sideroxylon reclinatum*

ssp. austrojloridense), Florida brickell-bush (*Brickellia mosieri*), Florida pineland crabgrass (*Digitaria pauciflora*), Florida prairie clover (*Dalea carthagenesis floridana*), Florida semaphore cactus (*Consolea corallicola*), pineland sandmat (*Chaemaesyce deltoidea pinetorium*), Bartram's hairstreak butterfly (*Strymon acis bartrami*), and the Florida leafwing butterfly (*Anaea troglodyta floridalis*).

Incidental take was not provided in the 2014 Programmatic BO for the Everglade snail kite, the CSSS and the wood stork, however take is anticipated on these three species. The 2014 Programmatic BO recognized that take will be enumerated when a final BO is required for each phase of CEPP implementation. The 2014 Programmatic BO recognized that incidental take of the eastern indigo snake is likely during construction and operation of CEPP, particularly construction of the A-2 FEB and the Miami Canal backfill identified within the 2014 CEPP Recommended Plan. The amount of take includes 14,000 acres of the FEB currently in sugar cane and row crops that will become inundated and mostly unusable to indigo snakes. Up to 268 snakes could be harassed through being displaced as a result of the CEPP and up to two indigo snakes may be injured or killed (harmed).

A programmatic ESA Section 7 consultation for the Comprehensive Everglades Restoration Plan (CERP) was prepared on March 15, 2013 to evaluate potential effects of CERP on listed species and designated critical habitat under the NMFS' purview. The Corps provided a Programmatic BA for the CERP to NMFS on July 2, 2013. NMFS provided a Programmatic BO for the CERP to the Corps on December 17, 2013 that included consultation for the CEPP. The 2013 Programmatic BA concurred with the determination that CERP, including CEPP, is not likely to adversely affect any listed species or their designated critical habitat. The 2013 Programmatic BO concurred with the "No Effect" determinations made by the Corps in regard to the applicable threatened or endangered species that fell under the purview of NMFS as a result of CEPP implementation. These included "No effect" determinations for the Blue whale (*Balaenoptera musculus*), Finback whale (*Balaenoptera physalus*), Humpback whale (*Megaptera novaeangliae*), Sei whale (*Balaenoptera borealis*), Sperm whale (*Physeter microcephalus*), Gulf sturgeon (*Acipenser oxyrinchus desotoi*) and its critical habitat, Shortnose sturgeon (*Acipenser brevirostrum*), Elkhorn coral (*Acropora palmata*) and its critical habitat, Staghorn coral (*Acropora cervicornis)* and its critical habitat and Johnsons seagrass (*Halophila johnsonii*) and its critical habitat. A may affect determination was made for the Smalltooth sawfish (*Pristia pectinata*) and its critical habitat, the Green sea turtle (*Chelonia mydas*) and its critical habitat, Hawksbille sea turtle (*Eretmochelys imbricate*) and its critical habitat, Kemp's Ridely sea turtle (*Lepidochelys kempii*), Leatherback sea turtle (*Dermochelys coriacea*) and its critical habitat, and the Loggerhead sea turtle (*Caretta caretta*). The 2013 Programmatic BO determined that the Corp's consultation responsibilities under the ESA for species under the NMFS purview was concluded, noting that consultation must be initiated if a take occurs or new information reveals effects of the action not previously considered, or the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action.

2.2 Consultation Summary CEPP South

The Corps recognizes per the 2014 Chief's Report that future BOs are required prior to the execution of CEPP, including CEPP South. The purpose of this BA is to evaluate the potential effects of CEPP South on both listed species and those proposed for listing, including designated and proposed critical habitat, and determine whether the continued existence of any such species or habitat is likely to be adversely affected by the federal action. On November 20, 2017, correspondence was provided to the USFWS indicating that the Corps was beginning preparation of a Validation Study for CEPP South. The Corps has consulted with the USFWS by letter dated November 20, 2017 on federally listed threatened and endangered species

that may be present in the action area. In correspondence dated December 27, 2017, the USFWS provided a revised species list for CEPP South that included changes to several plant species whose status had changed from proposed listed to listed. Correspondence was provided to the USFWS on April 18, 2018, requesting confirmation on the current species list. Confirmation was received from the USFWS. Federally threatened and endangered species that may be encountered within or adjacent to the action area include the Florida panther, Florida bonneted bat, Florida population of West Indian Manatee (Florida manatee), CSSS, Everglade snail kite, piping plover, red-cockaded woodpecker, roseate tern, wood stork, American alligator, American crocodile, Eastern indigo snake, Bartram's hairstreak butterfly, Florida leafwing butterfly, Miami blue butterfly, Schaus swallowtail butterfly, Stock Island tree snail, crenulate lead-plant, deltoid spurge, Garber's spurge, Okeechobee gourd, Small's milkpea, tiny polygala, Big Pine partridge pea, Blodgett's silverbush, Cape Sable thoroughwort, Carters small-flowered flax, Everglades bully, Florida brickell-bush, Florida bristle fern, Florida pineland crabgrass, Florida prairie clover, Florida semaphore cactus, pineland sandmat, and sand flax. In addition, the CEPP South action area contains designated critical habitat for the Florida manatee, CSSS, snail kite, American crocodile, Bartram's hairstreak butterfly, Florida leafwing butterfly, Cape Sable thoroughwort, Carter's small-flowered flax, Florida brickell-bush, and Florida semaphore cactus. Critical habitat for Bartram's hairstreak butterfly, Florida leafwing butterfly, Carter's small-flowered flax, and Florida brickell-bush was not designated at the time consultation was completed with the USFWS with receipt of the 2014 CEPP Programmatic BO.

The Corps previously prepared a BA on July 18, 2018, that identified potential effects on listed species, including designated and proposed critical habitat, pertaining only to those features identified in the CEPP South Validation Report. The USFWS provided a Draft Supplemental Programmatic BO for CEPP South on October 15, 2018 for the Corps' review. The 2018 Draft Supplemental Programmatic BO indicated that once more certainty regarding project details and implementation dates are learned, USFWS will enumerate incidental take and complete consultation on the endangered Everglade snail kite and its designated critical habitat, the endangered Cape Sable Seaside Sparrow, and its designated critical habitat, and the threatened wood stork. More specifically, during these preliminary discussions, the USFWS noted that once the Corps provides more detailed information regarding the operations of CEPP South, the USFWS will provide incidental take levels if appropriate. The Corps acknowledged the USFWS' desire for additional information prior to enumerating take and therefore deferred formal consultation on the above listed avian species. The Corps modified its prior request for formal consultation to a request for informal in correspondence dated November 30, 2018.

The Corps is reinitiating consultation with the USFWS on CEPP South based on coordination in 2019, in which the USFWS agreed that once the Corps completed modeling for the proposed COP and selected a preliminary preferred plan, the Corps would update and re-submit this CEPP South BA which would be used for preparation of the USFWS BO.

The specific features of the 2014 CEPP Recommended Plan to be implemented in CEPP South will include conveyance features that function to deliver and re-distribute existing water from WCA 3A to WCA 3B, ENP and Florida Bay. The Corps has prepared this BA that identifies potential effects on listed species, including designated and proposed critical habitat, pertaining to those features identified in the CEPP South Validation Report and includes adaptive management features identified within the 2014 CEPP/Final PIR/EIS Adaptive Management and Monitoring Plan to improve southerly flow conveyance in the Blue Shanty Flowway. These adaptive management features include complete backfill of approximately one and a half miles of an east-west agricultural ditch, removal of spoil mounds adjacent to the east-west agricultural ditch (re-grading to match adjacent ground surface elevations), active

vegetation management of historic sloughs encroached with sawgrass, and the placement of temporary pump(s) adjacent to the L-29 canal to improve southerly flow conveyance prior to the L-29 levee gap removal.

The Corps reaffirms the 2018 CEPP South BA species effects determinations for the following listed species: the Florida panther, West Indian manatee and its critical habitat, the Florida bonneted bat, American alligator, American crocodile and its critical habitat, Eastern indigo snake, the piping plover, the red-cockaded woodpecker, the roseate tern, the Miami blue butterfly, the Schaus swallowtail butterfly, the Stock Island tree snail, the crenulate lead-plant, the Okeechobee gourd, the Big Pine partridge pea, the Cape Sable thoroughwort, Carters small-flowered flax, the Florida brickell-bush, the Florida semaphore cactus, the Florida bristle fern, and the sand flax. The USFWS provided concurrence on these species determinations in correspondence dated December 21, 2018. The Corps has changed its effect determinations from the 2018 CEPP South BA for the following listed species based on new information regarding the presence of these species in the action area: the deltoid spurge, the Garber's spurge, the Small's milkpea, the tiny polygala, Bartram's hairstreak butterfly, the Florida leafwing butterfly, Blodgett's silverbush, Everglades bully, the Florida pineland crabgrass, the Florida prairie clover, and pineland sandmat. The updated effect determinations are detailed in **Section 6.3**.

3 STUDY AREA

The study area for CEPP identified in the 2014 CEPP PIR/EIS (USACE 2014) encompasses the Northern Estuaries (St. Lucie River and Indian River Lagoon and the Caloosahatchee River and Estuary), Lake Okeechobee, a portion of the Everglades Agricultural Area (EAA), the WCAs, ENP, the Southern Estuaries (Florida Bay and Biscayne Bay), and the Lower East Coast (LEC) (**FIGURE 1**). CEPP South will include conveyance features that function to deliver and re-distribute existing water from WCA 3A to WCA 3B and Northeast Shark River Slough (NESRS) of ENP which is the area of potential effect focused on in this BA. Reference the inset on **FIGURE 1** below.

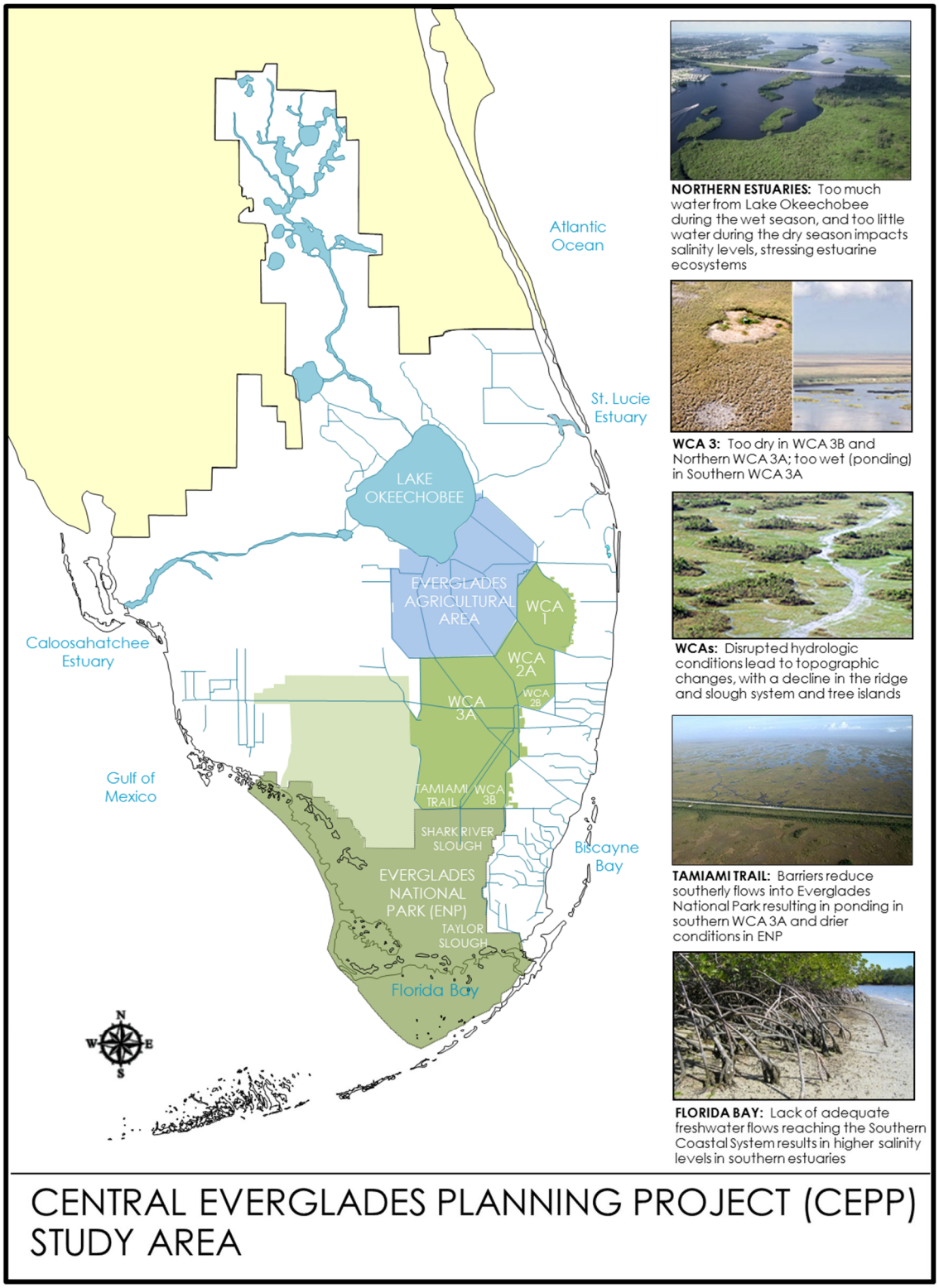


FIGURE 1. MAP OF STUDY AREA

4 CEPP SOUTH PROJECT DESCRIPTION

4.1 CEPP SOUTH PLAN FEATURES

The purpose of CEPP as identified in the 2014 CEPP Final PIR/EIS is to improve the quantity, quality, timing and distribution of water flows to the Northern Estuaries (St. Lucie and Caloosahatchee), central Everglades (WCA 3 and ENP), and Florida Bay while increasing water supply for municipal and agricultural users (USACE 2014). Due to the size and complexity of CEPP, project implementation will involve the integration of multi-year construction through individual PPAs or amendments to existing PPAs between the Corps and the SFWMD. Phased implementation efforts maximize the opportunity to realize incremental restoration benefits by initially building features that utilize existing water in the system that meets state water quality standards. The Corps has completed a Validation Study for the CEPP: South component (CEPP South). The CEPP South Validation Study has confirmed project components, construction sequencing, and project dependencies as identified in the 2014 CEPP Final PIR/EIS and Chief's Report (USACE 2014). The 2014 CEPP Final PIR/EIS is available at: https://www.saj.usace.army.mil/Missions/Environmental/Ecosystem-Restoration/Central-Everglades-Planning-Project/.

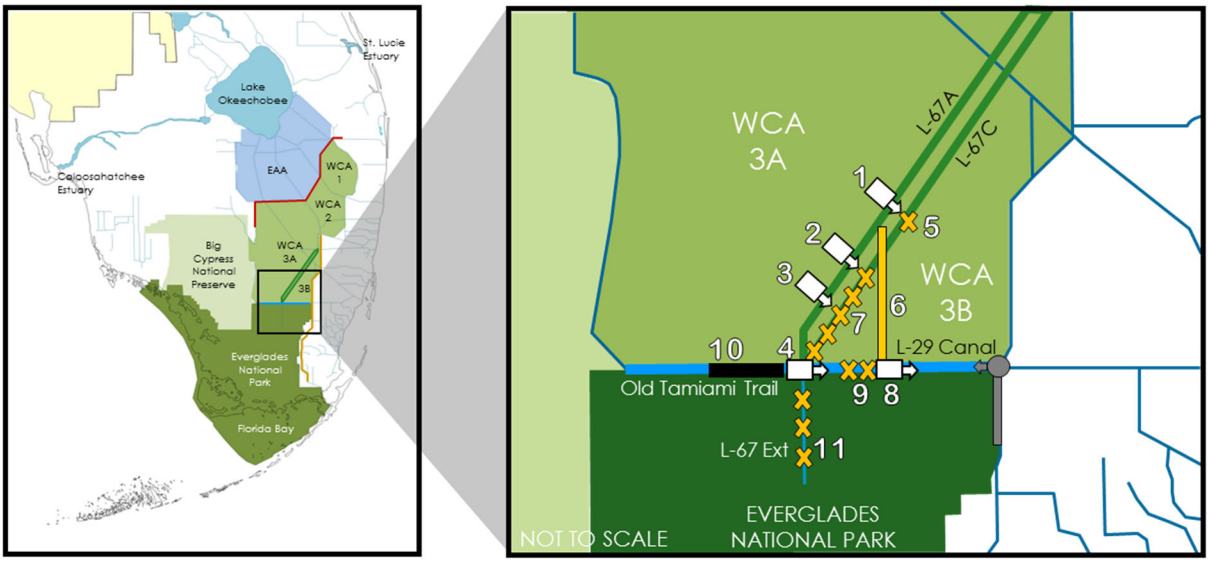
Components of the CEPP Recommended Plan were grouped into three separate implementation phases within the 2014 CEPP Final PIR/EIS based upon the spatial distribution of the Recommended Plan features and the locations within the CEPP study area where separable hydrologic environmental benefits would accrue. As described in the 2014 PIR/EIS, these groupings included project features in northern WCA 3A (CEPP North), project features in southern WCA 3A, 3B and ENP (CEPP South), and project features that provide new water and required seepage management that benefits the entirety of the study area (CEPP New Water). In section 1308(a) of the Water Resources Development Act (WRDA) of 2018, Congress authorized the project for ecosystem restoration, Central and Southern Florida, Everglades Agricultural Area, Florida, which modified the New Water implementation phase of CEPP. The primary modifications are that the 14,000-acre CEPP A-2 Flow Equalization Basin (FEB) was converted to a 10,500-acre storage reservoir and a 6,500-acre Stormwater Treatment Area (STA) was added to the project. **TABLE 1** illustrates the Recommended Plan features identified within the 2014 CEPP Final PIR/EIS (USACE 2014), as modified by WRDA 2018. Reference Section 6 of the 2014 CEPP Final PIR/EIS for a complete description of project dependencies including CERP and non-CERP projects that must be constructed and operating before implementation of the associated CEPP features (USACE 2014). The specific features of the CEPP Recommended Plan to be implemented in CEPP South included conveyance features that function to deliver and re-distribute existing water from WCA 3A to WCA 3B, ENP and Florida Bay. Construction of CEPP features in CEPP South were identified to prepare the system for the future additional inflows from Lake Okeechobee by providing the necessary additional outlet capacity from WCA 3A. Potential effects that are evaluated within this BA include the direct and indirect effects associated with the CEPP South features, independent of other CEPP North or New Water project features. Both CEPP North and CEPP New Water will have updated ESA consultations for those specific actions.

TABLE 1. CEPP PROJECT FEATURES BY IMPLEMENTATION PHASE

CEPP North	• L-6 Diversion
	• S-8 Pump Modifications
	• L-4 Levee Degrade and Pump Station
	• L-5 Canal Improvements
	• Miami Canal Backfill
CEPP South	• L-67 A Structure North
	• One L-67 C Gap (6,000 ft.)
	• Increase S-356 to 1,000 cfs
	• Increase S-333*
	• L-29 Gated Spillway
	• L-67 A Structures 2 and 3 South
	• L-67 A Spoil Mound Removal
	• Remove L-67 C Levee Segment
	• Remove L-67 Extension Levee (No Backfill)
	• 8.5 Mile Blue Shanty Levee
	• Remove L-29 Levee Segment
	• Backfill L-67 Canal Extension
	• Remove Old Tamiami Trail**
CEPP New Water	• Seepage Barrier L-31 N
	• A-2 Reservoir
	• Miami Canal and North New River Canal Improvements

***** Action currently being pursued by the South Florida Water Management District (SFWMD)
** Action currently being pursued by the National Park Service (NPS)

CEPP South included construction of a new Blue Shanty levee extending from Tamiami Trail northward to the L-67A levee. The Blue Shanty levee will divide WCA 3B into two subunits, a large eastern unit (3B-E) and a smaller western unit, the Blue Shanty Flowway (3B-W). The Blue Shanty levee is the most efficient means to restore continuous southerly sheetflow through a practicable section of WCA 3B and alleviates concerns over effects on tree islands by maintaining lower water depths and stages in WCA 3B-E. The width of the 3B-W flowway is aligned to the width of the downstream 2.6-Mile Tamiami Trail Next Steps Bridge, optimizing the effectiveness of both the flowway and bridge. In the western unit, CEPP South included the construction of two new gated control structures on the L-67A, removal of the L-67C and L-29 Levees within the flowway, and construction of a divide structure in the L-29 Canal to enable continuous sheetflow of water to be delivered from WCA 3A through WCA 3B to ENP. A gated control structure was also identified in CEPP South to be added to the L-67A, outside the flowway, to improve the hydroperiod of the eastern unit of WCA 3B. Increased outlet capability at the S-333 structure at the terminus of the L-67A canal, removal of approximately 5.5 miles of the L-67 Extension Levee, and removal of approximately 6 miles of Old Tamiami Trail between the ENP Tram Road and the L-67 Extension Levee was identified in CEPP South to facilitate additional deliveries of water from WCA 3A directly to ENP. The capacity of S-333 would be increased to 2,500 cubic feet per second (cfs). In order to mitigate seepage from WCA 3B and NESRS, a new 1,000 cfs S-356 Pump Station would be constructed to replace the existing temporary 500 cfs S-356 Pump Station. **FIGURE 2** further illustrates components of the CEPP Recommended Plan identified to be included in CEPP South from the 2014 CEPP Final PIR/EIS (USACE 2014).



LEGEND: Pump | Gated Structure | Levee | Levee Removal | Road Removal | Yellow Line Features

#	STRUCTURE	STRUCTURE/FEATURE TYPE	CFS	TECHNICAL NOTES
1	S-631	Gated Culvert	500	Delivers water from WCA 3A to 3B, east of L-67D Levee
2	S-632	Gated Culvert	500	Delivers water from WCA 3A to 3B, west of L-67D Levee
3	S-633	Gated Culvert	500	Delivers water from WCA 3A to 3B, west of L-67D Levee
4	S-333 (N)	Gated Spillway w/new canal	1150	Delivers water from L-67A Canal to L-29 Canal; supplements existing S-333 gated spillway
5		L-67C Levee Removal Gap		Gap, ~ 6000 feet (corresponding to S-631)
6	L-67D	Blue Shanty Levee		Levee, ~ 8.5 miles, connecting from L-67A to L-29 (6 feet high, 14-foot crest width, 3:1 side slopes)
7		L-67C Levee Removal		Complete removal of ~ 8 miles from New Blue Shanty Levee (L-67D)south to intersection of L-67A/L-67C; L-67C canal is not backfilled
8	S-355W	Gated Spillway	1230	Maintains water deliveries to eastern L-29 Canal
9		Levee Removal (L-29)		Removal of ~ 4.3 miles between L-67A and Blue Shanty Levee intersection with L-29 Levee
10		Removal of remnants of Old Tamiami Trail roadway		Removal of ~ 6 miles of roadway west of L-67 Extension
11		L-67 Extension Levee Removal and Canal Backfill)		Complete removal of ~ 5.5 miles of remaining L-67 Extension, including S-346 culvert

FIGURE 2. CEPP RECOMMENDED PLAN SOUTHERN DISTRIBUTION AND CONVEYANCE FEATURES AND LOCATION (USACE 2014).

The Corps and the SFWMD entered into a design agreement dated May 12, 2000 for purposes of conducting activities related to planning, engineering and design of CERP projects including the WCA 3 DECOMP Project. The DECOMP Physical Model (DPM) is designed to provide information regarding the effects of levee removal and canal backfill on the ridge and slough landscape. The main purpose of the DECOMP Project is to remove sheetflow obstructions in order to reestablish the ecological and hydrological connection between WCAs 3A and 3B, ENP, and BCNP. The DPM is being conducted pursuant to that agreement as a design effort to gather information to formulate decompartmentalization of WCA 3 and use for the design of CERP features. The DPM is a temporary field test, designed to provide essential information regarding environmental variables that may enable or control development or maintenance of the corrugated, ridge and slough landscape characteristic of the historic Everglades. The DPM is a limited duration, fully controlled field test conducted along a 3,000 foot stretch of the L-67A and L-67C levees and canals in WCA 3A and WCA 3B. The project provides for the temporary installation of 10, 60-inch culverts (collectively called S-152) with a combined discharge capacity of 750 cubic feet per second (cfs) installed along a stretch of the L-67A levee. Three 1,000 foot backfill treatments (no backfill, partial backfill and complete backfill) are located within the L-67C canal, adjacent to and directly southeast of the S-152 structure. The L-67C levee is gapped for 3,000 feet, directly east of the backfill treatments, to allow the flow from WCA 3A to pass through the culverts, through the “pocket”, across the backfill treatments and into WCA 3B.

The duration of the DPM was extended from the originally proposed two year duration to four years with completion of a Supplemental EA and FONSI on July 8, 2015 (USACE 2015), while maintaining the permitted operational window from November through January. Phase 2, which was documented through a Supplemental EA and FONSI on November 9, 2017 (USACE 2017), further extended the DPM through 2021 and also allowed for year round operation of the DPM, subject to continued adherence to permitted water quality constraints.

Additional testing of the DPM was identified in the CEPP Adaptive Management Plan to inform and aid in future PED efforts for CEPP. Identified in the CEPP Adaptive Management Plan to help address uncertainty, identification number (ID#) 77, "Will the full suite of CEPP recommended plan structures be required in WCA 3B to create the Blue Shanty Flowway?" Data collected during 2013 through 2018 indicate a strong tendency of water to move eastward, and not in the historic, north-to-south direction as intended for southern WCA 3B in CEPP. During DPM Phase 1, late wet/early dry season flows (typically 2-3 months in duration) were examined in the pocket (between L-67A and C levees) and showed that water moves preferentially east (Sklar and Dreschel, 2015 and 2017; Larsen et al., 2017). While flow direction in the pocket is caused by localized hydrologic gradients associated with the DPM constructed features (i.e., L-67C levee gap), the eastward flow in the larger WCA 3B basin was also supported. During the high-water emergency operations from June-July 2017, S-152 discharges were of a similar or greater magnitude (514-638 cfs) as that proposed for CEPP culverts (500 cfs). These data therefore provide a useful example of stage changes within WCA 3B expected from the proposed CEPP culvert discharges. Daily stage changes in WCA 3B (adjusted by subtracting local daily rainfall) showed the highest stage increases nearest the DPM’s L-67C levee gap (site TI9: 0.013 ft./d; 1.5-km east of the gap), lower increases in central 3B (Site 71: 0.007 ft./d; 7.5-km northeast of the gap) and a decrease at the site south of the gap (EDEN10: -0.002 ft./d; 6-km south of the gap). The variability of these stage changes (using daily values as replicates) is very large, and furthermore the resistance by vegetation must be accounted for to fully understand the discharge and stage relationships. Nevertheless, this information supports that additional measures are needed to redirect flow southward in WCA 3B.

During development of the 2014 CEPP PIR/EIS, several of the alternatives which were modeled and evaluated did not include the Blue Shanty Levee. Following from the detailed evaluations in the 2014 CEPP PIR/EIS (refer to Appendix E and Appendix G of the 2014 PIR/EIS for full discussion), the Blue Shanty Levee was identified as a critical component for the CEPP Recommended Plan. The Blue Shanty Flowway negates the need for additional seepage management features north of Tamiami Trail along the L-30 (eastern side of WCA 3B). Without the new WCA 3B levee, additional seepage management features would be required to protect against increased flooding risk to the adjacent Lower East Coast areas that would result from holding WCA 3B stages higher to promote significant wet season gravity outflows to the L-29 Canal. The flowway generated by the Blue Shanty Levee in would increase flows through western WCA 3B while maintaining protective water depths in eastern WCA 3B. Of the alternatives considered for the 2014 CEPP PIR/EIS, the CEPP Recommended Plan best achieves the goal of re-establishing hydrologic and ecologic connectivity of WCA 3A, WCA 3B, and ENP by degrading the L-67 C and L-29 Levees west of the Blue Shanty Levee. Long, continuous and uninterrupted patterns of sheetflow from north to south are a defining characteristic of the Everglades. The proposed flowway restores sheetflow consistent with the landscape patterns of the natural system.

A portion of the features identified within CEPP South in the 2014 CEPP Final PIR/EIS are currently being pursued and constructed by the National Park Service (NPS) and the SFWMD. These include the increased capacity of S-333N and the removal of Old Tamiami Trail. In compliance with the National Environmental Policy Act (NEPA), the NPS, in cooperation with the Corps, prepared the Old Tamiami Trail Modifications Environmental Assessment (EA) that evaluated proposed modifications to the original 5.7-mile segment of Old Tamiami Trail located along the northern boundary of ENP (NPS 2018). The EA tiers off and incorporates by reference, the 2014 CEPP Final PIR/EIS which, as noted above and referenced in **TABLE 1** and **FIGURE 2,** included the removal of up to 5.7 miles of the Old Tamiami Trail. The purpose of the removal of Old Tamiami Trail is to enhance sheetflow from WCA 3A into the Shark River Slough via the S-12C and S-12D water control structures. Based on the analysis presented in the EA, the proposed action selected by the NPS includes removal of 5.45 miles of the roadbed. The removal of Old Tamiami Trail is anticipated to begin in January of 2020 with final construction completion by January 2022. The SFWMD initiated a request to the Corps by letter dated October 25, 2017 for the design of the S-333 spillway modification feature of the CEPP. The SFWMD requested the Corps to participate in the review of the SFWMD's design initiated in November of 2017. S-333N final design underwent a 33 USC 408 (Section 408) review that was completed in June of 2018. Section 408 provides the Corps the ability to grant permission for another party to alter a Civil Works project upon a determination that the alteration proposed will not be injurious to the public interest and will not impair the usefulness of the Civil Works project. After completion of the Section 408 review, the SFWMD awarded construction of S-333N in September 2018 with the goal of completing construction in April 2020. The Florida Department of Environmental Protection (FDEP) issued a Comprehensive Everglades Restoration Plan Regulation Act (CERPRA) permit for S-333N to the SFWMD in July 2018 for Emergency Limited Operations for WCA 3A High Water Relief, and these operations were included in the COP hydrologic modeling.

Features included within the Proposed Action are described below:

- S-333N – The new S-333 gated spillway would have a design capacity of 1,150 cfs, to deliver water from the L-67A Canal to the L-29 Borrow Canal. It would be constructed just north of the existing S-333 structure, bringing the combined design capacity of both structures to 2,500 cfs. The combination of the S-333 structures; along with the S-631, S-632, and S-633 described below; would supersede the S-12s in being the primary discharge point for WCA 3A.

- S-631 - The structure would be a gated culvert with a design capacity of 500 cfs. S-631 would be located in L-67A to deliver water from WCA 3A to WCA 3B, east of the L-67D Levee. Spoil mounds along the northwestern side of the L-67A canal in the proximity of this structure will be removed to facilitate sheetflow connectivity with the WCA 3A marsh.

- S-632 - The structure would be a gated culvert with a design capacity of 500 cfs. S-632 would be located in L-67A to deliver water from WCA 3A to WCA 3B, within the WCA 3B flowway. Spoil mounds along the northwestern side of the L-67A canal in the proximity of this structure will be removed to facilitate sheetflow connectivity with the WCA 3A marsh.

- S-633 - The structure would be a gated culvert with a design capacity of 500 cfs. S-633 would be located in L-67A to deliver water from WCA 3A to WCA 3B, within the WCA 3B flowway. Spoil mounds along the northwestern side of the L-67A canal in the proximity of this structure will be removed to facilitate sheetflow connectivity with the WCA3A marsh.

- L-67D - The L-67D Levee would connect L-67A to L-29 and serve as the eastern perimeter levee for the WCA-3B flowway. It would run from due north from the L-29 Levee, starting approximately 4.3 miles east of S-333. The total length would be approximately 8.5 miles. The crest width would be 14 feet, the height would be 6 feet, and the side slopes would be 3:1.

- L-67C Levee (Separates WCA 3A from WCA 3B, parallel to the L-67A Levee) - Approximately 8 miles of the L-67C Levee, west of the proposed L-67D Levee, would be removed from the area north of Tamiami Trail within the WCA-3B flowway. The adjacent canal would not be backfilled. North of the new L-67D Levee, an approximate 6,000 feet gap would be created to distribute discharges from S-631 to eastern WCA-3B. The levee removal and gapping would allow a more natural flow of water from WCA 3A to WCA 3B, and the WCA 3B flowway would provide a direct hydrologic connection to ENP.

- L-67 Extension Levee (Located in ENP, south of S-333) - The entire remaining length of the L-67 Extension Levee (5.5 miles) would be removed and the adjacent borrow canal would be backfilled (5.5 miles). This would allow a more natural flow of water and provide a direct hydrologic connection between Northeast Shark River Slough and Western Shark River Slough.

- S-355W - The S-355W structure would be a gated spillway located in line with the L-29 Canal at the southern extent of the proposed L-67D levee, with a design capacity of 1,230 cfs. The purpose of the S-355W would be to convey water from the L-29 Canal within the Blue Shanty Flowway, eastward towards the existing S-334 spillway to provide assistance in meeting ENP ecological objectives.

- L-29 Levee (Southern boundary of WCA 3B, east of S-333). Approximately 4.3 miles of the L-29 Levee, west of the new L-67D Levee, would be removed. This would allow water to move through the WCA-3B Flowway.

- S-356 (New) - The new S-356 Pump Station would replace the current temporary pump station and have a design capacity of 1,000 cfs to provide seepage return to ENP. It would be located in the vicinity of the existing temporary pump station. This pump station should be able to concurrently handle the discharges from S-335 and the seepage into L-31N (from S-335 to G-211) without requiring discharges to tide.

The 2014 CEPP Final PIR/EIS included an AMMP to identify the monitoring information needed to inform implementation and to document progress towards meeting the project goals and objectives, as well as address uncertainties related to project performance. During preparation of the CEPP South Validation Study, the Corps coordinated with members of the Decomp Physical Model (DPM) Science Team regarding the 2014 CEPP AMMP and the team is recommending the Corps to proceed with a sub-set of management options previously identified in the 2014 CEPP AMMP as part of the construction contracts for CEPP South as described below:

- *Complete Backfill of East-West Agricultural Ditch and Spoil Mound Removal* – The 2014 CEPP PIR/EIS and AMMP recommended management options to fill agricultural ditches in the Blue Shanty Flowway to improve southerly flow conveyance to the L-29 Canal and to move water through the Tamiami Trail bridges. Reference the red circle in **FIGURE 3** for the location of the approximate 4.0 mile (21, 120 feet) east-west agricultural ditch to be backfilled. The horizontal east west black line in **FIGURE 3** shows the extent of backfill anticipated under Contract 1 for CEPP South. Approximately 1.56 miles (8,240 feet) are expected to be backfilled under Contract 1. The agricultural ditch appears to have been excavated, with the excavated material being cast on the north and south sides of the ditch. Vegetation has been naturally established on each of these material mounds. To fill the ditch, tracked equipment would push the excavated material and vegetation into the ditch, filling the ditch. The tracked equipment would work in a 50-foot width centered on the existing ditch centerline. The material on the ditch would be compacted so that the material in the ditch is lower than the surrounding grade by 6-inches. Muck material excavated from the S-631, S-632, and S-633 structures would then be placed so that the material in the ditch is equal with the surrounding grade. The tracked equipment would access the east-west ditches from both L-67 A and L-67 C. Following placement of the initial fill material for the L-67D Levee, additional access for the tracked equipment may be provided from L-67D.

- *Active Vegetation* Management – The 2014 CEPP PIR/EIS and AMMP recommended management options to pursue active vegetation management in the Blue Shanty Flowway to enhance flow by reconnecting historic sloughs. Historic sloughs in WCA 3B have been encroached with sawgrass due to changes in hydrology. Active vegetation management of these sloughs is expected to redirect more flow toward the natural orientation (south) of the landscape and to increase the areal extent of sheetflow in the Blue Shanty levee. Active vegetation management would be accomplished through the use of herbicides (glyphosate). The potential location for active vegetation management within the Blue Shanty Flowway is depicted in **FIGURE 4** in white, consisting of 1,003 acres. The white coloration depicts remnant sloughs.

- *L-29 Canal Temporary Pumps* – Due to the phased construction schedule currently anticipated for the CEPP South features, which includes completion of the S-631, S-632, and S-633 gated culverts on the L-67A Levee and corresponding L-67C gaps prior to the degrade of the 4.3 miles of the L-29 Levee between L-67A and the intersection of the Blue Shanty levee (L-67D) with the L-29 levee, temporary pumps will be installed adjacent to the L-29 Canal to facilitate the achievement of adaptive management objectives The proposed temporary pumps would be utilized as an interim measure to improve the southerly flow conveyance to the L-29 Canal, complementing the active vegetation management within the Blue Shanty Flowway. During the 2017 and 2018 water management deviations for WCA 3A high water conditions, the SFWMD similarly deployed temporary pumps at the S-355A structure to allow for releases from WCA 3B flows that were added from WCA 3A by use of the S-152 structure. The temporary pumps would be installed between L-67A and the CEPP South L-67D. Since the location is west of S-355A, an additional

pump collection sump may need to be installed immediately adjacent and north of the L-29 Levee. When the pumps are removed in advance of the L-29 Levee segment removal, the sump location is expected to be returned to the pre-installation condition. Based on the use of temporary pumps during the 2017 and 2018 deviations, it is expected that no more than two sumps (100 cfs each) at approximately 25-50 feet length by 12-25 feet width is expected. The total footprint would be approximately 0.03 acres.

FIGURE 3. CEPP RECOMMENDED PLAN SOUTHERN DISTRIBUTION AND CONVEYANCE FEATURES AND LOCATION (USACE 2014) INCLUDING LOCATION OF COMPLETE BACKFILL OF EAST WEST AGRICULTURL DITCH IDENTIFIED WITH THE RED CIRCLE. THE HORIZONTAL EAST WEST BLACK LINE SHOWS THE EXTENT OF BACKFILL ANTICIPATED UNDER CONTRACT 1 FOR CEPP SOUTH.

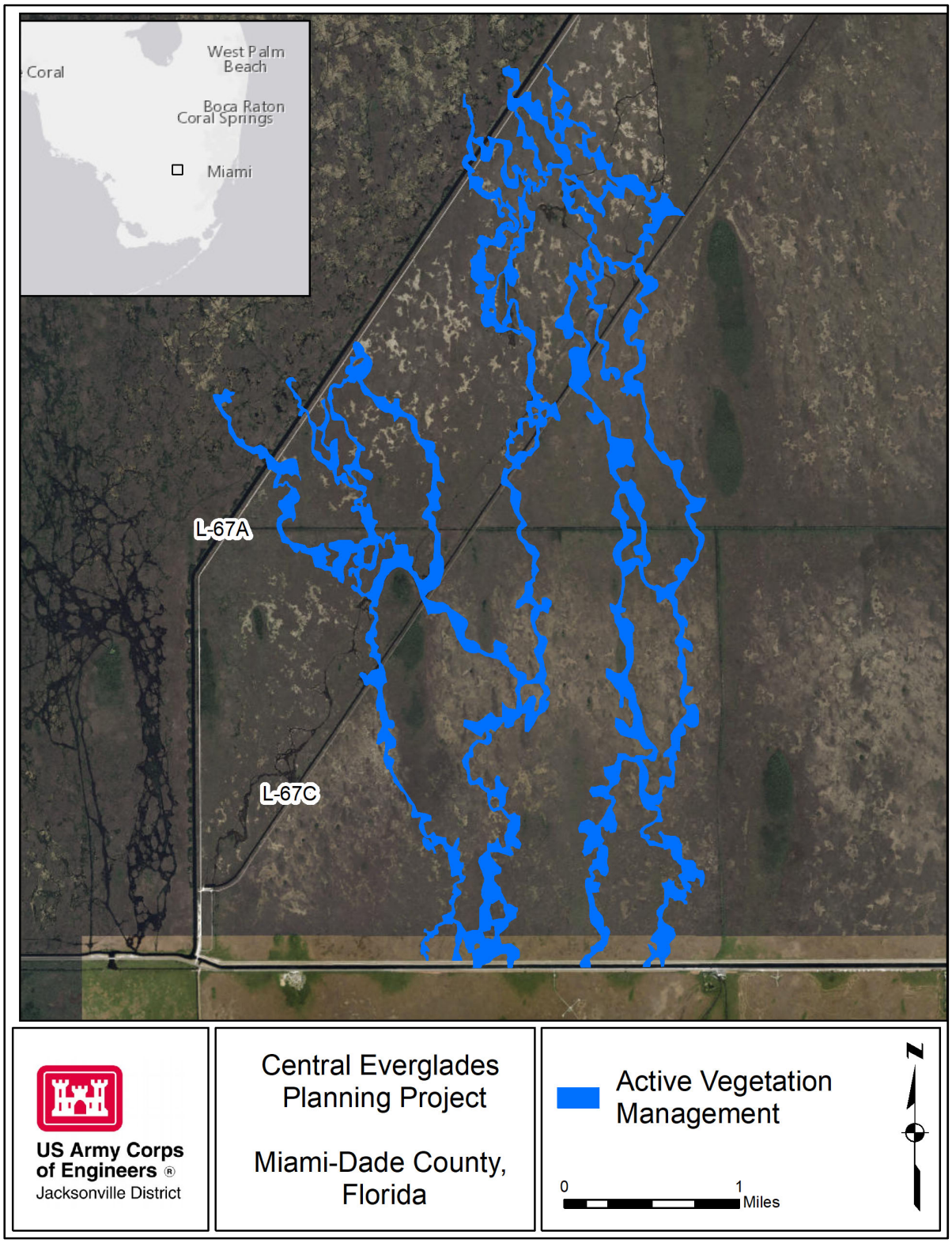


FIGURE 4. LOCATION OF POTENTIAL ACTIVE MARSH IMPROVEMENT IN THE BLUE SHANTY FLOWWAY IN WCA 3B.

The overarching project need for CEPP South is to increase the availability of water deliveries from WCA 3A through WCA 3B and into ENP through NESRS, to the maximum extent practicable, for the benefit of natural resources. Operations of the CEPP South features are expected to be subject to current downstream constraints, as identified by the proposed COP, which include maintaining the maximum operating limit in the L-29 canal at or below a specified stage and maintaining required water levels in the residential and agricultural areas in southeastern Miami-Dade County. Operations of the CEPP South features will also be subject to seasonal closures of the WCA 3A outlet structures identified to provide favorable conditions for CSSS Subpopulation A (CSSS-A) nesting and breeding.

The proposed COP describes, system constraints anticipated to affect the operation of CEPP South features. The formulation of COP was governed by the MWD and C-111 South Dade Project objectives and constraints, and lessons learned from a series of MWD Incremental Field Tests conducted under the authority of the MWD Project (i.e. Increment 1, Increment 1.1 and 1.2, and Increment 2) to raise the L-29 canal maximum operating limit for the purpose of increasing flows to NESRS in ENP. The alternative formulation process was a five step process that can best be described as the Initial Array, Round 1, Round 2, Round 3, and Round 3 Optimization. The formulation process was a collaborative multi-agency and public effort. Regional hydrologic modeling was performed to identify the Preferred Plan (Alternative Q+ (ALTQ+)) based on evaluation of system conditions. COP is the last step to implement operational changes to convey water from WCA 3A to the ENP using the constructed features of the pre-CERP (CERP) Foundation Projects (MWD and C-111 South Dade Project) and would result in a change to the 2012 WCAs, ENP, and ENP-South Dade Conveyance System (SDCS) Water Control Plan.

The COP Preferred Plan is ALTQ+, which is largely based on the Round 3 Alternative Q (ALTQ) with minor tweaks based on sensitivity runs performed. In general, ALTQ+ meets all the project objectives and does not violate project constraints. The main component of ALTQ+ that improves water deliveries to ENP is the Tamiami Trail Flow Formula (TTFF). The TTFF replaces the 1985 WCA 3A Rainfall Plan. The TTFF uses information from water stages (WCA 3A and NESRS), rainfall (historical median WCA 3A and BCNP inflows with forecast adjustments), potential evapotranspiration (historical median), and recent structure flows to predict upcoming weekly flow target volumes across Tamiami Trail. Reference **Appendix A** of the COP BA submitted to the USFWS on December 11, 2019 for a full description of the COP Preferred Plan that would be included in the 2020 Water Control Plan governing initial regional water management operations, including the CEPP South project area.

Current operational constraints for CEPP South as defined by the COP include:

1. To facilitate increased flows out of WCA 3A, the L-29 canal is operated up to 8.5 feet, NGVD which allows for improved water deliveries to ENP via NESRS. However, the operating canal stages between 8.3 and 8.5 feet, NGVD are limited to 90 days per water year (May 1 to April 30), which is the interim FDOT constraint until Tamiami Trail Next Steps construction is completed. In addition, canal stages are limited by continued adherence 8.5 Square Mile Area (SMA) flood mitigation criteria. Outside the 90-day FDOT limit, the L-29 canal level will be maintained below 8.3 feet, NGVD subject to downstream constraints.

   The 2008 MWD Tamiami Trail Limited Re-evaluation Report (LRR) included recommendations to build a one mile long bridge in the project area's eastern segment and raise the headwater stage constraints in the L-29 Borrow Canal by one foot from 7.5 feet, NGVD to 8.5 feet, NGVD, which required road mitigation on parts of Tamiami Trail (U.S. Highway 41) in the action area,

located between S-333 on the west and S 334 on the east. To ensure the safety and stability of the roadway sub base infrastructure along this segment of Tamiami Trail (U.S. Highway 41), operational constraints [referenced within Section 6 (Recommended Plan) of the 2008 Tamiami Trail LRR] were set forth within the "Contract Between the United States of America and FDOT for Relocation, Rearrangement, or Alteration of Facilities Modified Water Deliveries to Everglades National Park Project (Relocation Agreement)") dated September 25, 2008. FDOT allowed USACE to use a new standard for the Tamiami Trail roadway (adopted in the March 2008 FDOT Flexible Pavement Design Manual) thereby reducing the required separation (Design Base High Water Clearance) between the Design High Water (DHW) and the bottom of the road base. Operational constraints as outlined within the Relocation Agreement dated September 25, 2008 are minimum protective standards that are included in ALTQ+. In coordination with FDOT, USACE has expanded hydrologic monitoring of water levels along the section of Tamiami Trail that is of concern. Data collected in accordance with the monitoring plan developed in consultation with FDOT will help to inform L-29 canal operations in COP.

The requirements of the Relocation Agreement, including any subsequent amendments to this agreement between USACE and FDOT, shall remain unchanged until full completion of Tamiami Trail Next Steps roadway construction, currently anticipated for late 2022 or early 2023. ALTQ+ includes the capability to further extend and/or remove the cumulative duration criteria for operating the L-29 Canal above 8.3 feet NGVD (referenced as the FDOT roadway constraint), while continuing to adhere to the maximum operating stage limit of 8.5 feet NGVD. Implementation of this change would not occur without: (1) written approval from FDOT to remove the L-29 Canal constraint identified in Appendix A (Water Control Plan), based on a joint evaluation of monitoring data by the USACE and the FDOT (this data evaluation is ongoing with the MWD Increment 2 field test); (2) demonstration of the capability of the completed MWD Project components to maintain flood mitigation requirements for the 8.5 SMA under the raised L-29 Canal maximum operating limit of up to 8.5 feet, NGVD; and (3) consideration of increased low-water stages within WCA 3A, including along the western L-29 Canal between S-12A and S-333. The requirement for all three pre-conditions to be met may preclude these operations during the initial implementation period of COP, since additional inflows of treated water to WCA 3A from the upstream Lake Okeechobee and EAA basins and/or additional flood mitigation requirements may be necessary.

2. The seasonal closures for the S-12A, S-12B, S-343A and S-343B remain unchanged from the 2016 ERTP BO. However, ALTQ+ includes removal of the seasonal closures at S-344 and includes limited adjustments to the S-332D seasonal pump restrictions. Lifting of S-344 closure dates and extending S-332D full pumping by an additional month, from November 30 to December 31, were based on coordination with the USFWS during development of the COP.

3. The Site 71 gage (USGS ID: 255250080335001) in WCA 3B must be below 8.5 feet NGVD for operation of S-152, in addition to other water quality constraints identified in the proposed COP Water Control Plan. For the interim operation condition following execution of Contract 1 for CEPP South, the CEPP structures (S-631, S-632, and/or S-633) would be operated consistent with the DPM (S-152) to maintain indicated hydroperiod effects. Operations of these structures would be discontinued when the stage at Site 71 exceeds 8.5 feet, NGVD.

No additional modeling of the CEPP South features was conducted to support development of this BA. Hydrologic modeling completed for the proposed COP was determined to provide sufficient information regarding anticipated operations of existing water management infrastructure. This BA was prepared based on qualitative analysis, utilizing prior hydrologic modeling from the 2013 CEPP BA, and the 2019 COP BA.

Reference **Section 2**. Additional modeling to support development of a Draft Project Operating Manual (DPOM) for the CEPP South features and supporting National Environmental Policy Act (NEPA) documentation is anticipated to be complete by July 2020. If any effects to listed species associated with the development of the DPOM are revealed that were not previously considered in this 2020 CEPP South BA (via an update to the Water Control Plan for the WCAs, ENP, and ENP to SDCS), the Corps will reinitiate ESA consultation, as appropriate under 50 CFR § 402.16.

4.2 Project Authority

CEPP was authorized by Section 1401(4)1 of the WRDA of 2016, Public Law 114-322, and amended by Section 1308(a) of the WRDA of 2018, Public Law 115-217.

4.3 Project Goal, Objectives, Constraints

The goals of CEPP remains consistent with prior planning efforts of CERP (USACE 1999). Specific CEPP objectives were identified in the 2014 CEPP PIR/EIS to address the central part of the southern Florida ecosystem to improve the quantity, quality, timing, and distribution of water flows to the central Everglades, including WCA 3 and ENP (USACE 2014). CEPP South will include conveyance features that function to deliver and re-distribute existing water from WCA 3A to WCA 3B, ENP and Florida Bay.

4.3.1 Goal and Objectives

The six CEPP objectives identified in the 2014 CEPP PIR/EIS were built upon the overall CERP goals and objectives (**TABLE 2**) in order to provide the needed linkages between the projects. CERP included goals for enhancing economic values and social wellbeing with specific objectives towards improving other project purposes of the C&SF project, including agricultural, municipal, and industrial water supply (USACE 2014). Section 601(h) of WRDA 2000 states “the overarching objective of the Plan is the restoration, preservation, and protection of the south Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection”. The goals of CEPP South remain consistent with those identified in the 2014 CEPP PIR/EIS (USACE 2014). Reference **TABLE 2**.

TABLE 2. GOALS AND OBJECTIVES OF CEPP. GOALS AND OBJECTIVES FOR CERP ARE ALSO DEPICTED TO ACKNOWLEDGE THE DIRECT LINKAGE BETWEEN THE TWO PROJECTS.

CERP Goal: Enhance Ecological Values	
CERP Objective	**CEPP Objective**
Increase the total spatial extent of natural areas	No corresponding CEPP objective; consider this objective in future increments
Improve habitat and functional quality	Restore seasonal hydroperiods and freshwater distribution to support a natural mosaic of wetland and upland habitat in the Everglades System
	Improve sheetflow patterns and surface water depths and durations in the Everglades system in order to reduce soil subsidence, the frequency of damaging peat fires, the decline of tree islands, and salt water intrusion
	Reduce high volume discharges from Lake Okeechobee to improve the quality of oyster and SAV habitat in the northern estuaries
Improve native plant and animal species abundance and diversity	Reduce water loss out of the natural system to promote appropriate dry season recession rates for wildlife utilization
	Restore more natural water level responses to rainfall to promote plant and animal diversity and habitat function
CERP Goal: Enhance Economic Values and Social Well Being	
Increase availability of fresh water (agricultural/municipal & industrial)	Increase availability of water supply
Reduce flood damages (agricultural/urban)	No corresponding CEPP objective; consider this objective in future increments
Provide recreational and navigation opportunities	Provide recreational opportunities
Protect cultural and archeological resources and values	Protect cultural and archeological resources and values

4.3.2 Constraints

Project constraints were recognized to ensure that the proposed project would not reduce the level of service for flood protection, protect existing legal users, and meet applicable water quality standards for the natural system. In accordance with Section 601(h)(5) of WRDA 2000, the following are constraints identified in the 2014 CEPP PIR/EIS for CEPP implementation:

- Avoid any reduction in the existing level of service for flood protection caused by plan implementation
- Provide replacement sources of water of comparable quantity and quality for existing legal users caused by plan implementation

Constraints identified for CEPP South remain consistent with those identified in the 2014 CEPP PIR/EIS (USACE 2014).

5 PERFORMANCE MEASURES

The purpose of CEPP as identified in the 2014 CEPP Final PIR/EIS is to improve the quantity, quality, timing and distribution of water flows to the Northern Estuaries (St. Lucie and Caloosahatchee), central Everglades (WCA 3 and ENP), and Florida Bay while increasing water supply for municipal and agricultural users (USACE 2014). In order to achieve the action objective, the Corps with input from the Project

Delivery Team (PDT) team, identified a list of performance measures (PMs) for purposes of evaluating the systems response to alternative plans during the development of the 2014 CEPP Final PIR/EIS.

Additional modeling of the CEPP South features referenced in **FIGURE 2** was not conducted at the time this BA was prepared; therefore modeling performed to support selection of a Recommended Plan from the 2014 CEPP Final PIR/EIS and 2013 CEPP BA along with modeling performed to support selection of a Preferred Plan (ALTQ+) from the 2019 COP BA will be referenced within this BA to determine species effects determinations on Federally listed threatened and endangered species as a result of CEPP South implementation.

Several of the project tools utilized within the 2013 CEPP BA (and referenced in the 2018 CEPP BA) were previously utilized during planning efforts for the Everglades Restoration Transition Plan (ERTP) in which PMs and ecologic targets (ET) were developed from the USFWS Multi-Species Transition Strategy for WCA 3A (USACE 2011, USFWS 2010). The USFWS Multi-Species Transition Strategy includes species-specific ranges (windows) which reflect water levels or water depths identified by species experts based on the best available science that are believed to provide optimal conditions for wading bird breeding and foraging as well as tree island considerations. Under ERTP, PMs are defined as a set of operational rules that identify optimal WCA 3A water stages and recession rates to improve conditions in WCA 3A for snail kite, wood stork, wading birds and tree islands. The ETs are designed to support the intention of PMs by providing hydroperiod guidelines to help maintain appropriate nesting and foraging habitat. In addition to the PMs and ETs, ecological planning tools developed by the Joint Ecosystem Modeling group (JEM) were also used within the 2013 CEPP BA for purposes of evaluating habitat suitability for fish and wildlife resources (Reference https://www.jem.gov/). The regional hydrologic model utilized as the primary tool to identify the CEPP Recommended Plan in the 2014 CEPP Final PIR/EIS (USACE 2014) included the South Florida Regional Simulation Model Glades-LECSA Implementation (RSMGL). Reference Section 4.3.3 (Performance Measures) of the 2013 CEPP BA for a complete description of the tools used to evaluate the CEPP Recommended Plan (USACE 2013).

Plan formulation efforts for the COP also utilized the same regional hydrologic models (RSMGL) and ecological planning tools as those used in the 2014 CEPP Final PIR/EIS and 2013 CEPP BA, in addition to metrics identified from the 2016 ERTP BO. Reference Section D.2.4.1 (Evaluation Tools) of the 2019 COP BA for a complete description of the tools used to evaluate the COP Preferred Plan (USACE 2019). Reference Section 4.3.5 of the 2013 CEPP BA and Section D.2.4 of the 2019 COP BA for further information on modeling assumptions related to the baselines used for comparative analysis to determine potential effects of the preferred plans (ALT4R2 [2013 CEPP BA] and ALTQ+ [2019 COP BA]).

6 DESCRIPTION OF EXISTING CONDITIONS, LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

6.1 Affected Environment

CEPP South will include conveyance features that function to deliver and re-distribute existing water from WCA 3A to WCA 3B, ENP and Florida Bay. The 2013 CEPP BA and the 2014 CEPP Final PIR/EIS provides a full description of the affected environment within the action area and is incorporated by reference into this document. The information is available for review at http://141.232.10.32/pm/projects/proj_51_cepp.aspx.

6.1.1 Vegetative Communities

The Everglades landscape is dominated by a complex of freshwater wetland communities that includes open water sloughs and marshes, dense grass- and sedge-dominated marshes, forested islands, and wet marl prairies. The primary factors influencing the distribution of dominant freshwater wetland plant species of the Everglades are soil type, soil depth, and hydrological regime (USFWS 1999). These communities generally occur along a hydrological gradient with the slough/open water marsh communities occupying the wettest areas (flooded more than nine months per year), followed by sawgrass marshes (flooded six to nine months per year), and wet marl prairie communities (flooded less than six months per year) (USFWS 1999). The freshwater wetlands of the Everglades eventually grade into intertidal mangrove wetlands and sub tidal seagrass beds in the estuarine waters of Florida Bay.

Development and drainage over the last century have dramatically reduced the overall spatial extent of freshwater wetlands within the Everglades, with approximately half of the pre-drainage 1.2 million hectares of wetlands being converted for development and agriculture (Davis and Ogden 1997). Alteration of the normal flow of freshwater through the Everglades has also contributed to conversions between community types, invasion by exotic species, and a general loss of community diversity and heterogeneity. Vegetative trends in ENP have included a substantial shift from the longer hydroperiod slough/open water marsh communities to shorter hydroperiod sawgrass marshes (Davis and Ogden 1997; Armentano et al. 2006). In addition, invasion of sawgrass marshes and wet prairies by exotic woody species has led to the conversion of some marsh communities to forested wetlands (Gunderson et. al. 1997).

Vegetative communities of the WCAs have suffered from both over drainage and prolonged periods of inundation associated with the stabilization of water levels (USACE 1999). Many areas of WCA 3A still contain relatively good wetland habitat consisting of a complex of tree islands, sawgrass marshes, wet prairies, and aquatic sloughs. Water lilies (*Nymphaea alba*) were originally widespread in sloughs throughout many areas of WCA 3A (McVoy et al. 2011). Reduced freshwater inflow and drainage by the Miami Canal have overdrained the northern portion of WCA 3A, resulting in increased fire frequency and the associated loss of tree islands, wet prairie and aquatic slough habitat. Northern WCA 3A is currently dominated largely by mono-specific sawgrass stands with large areas of shrubs and monotypic cattail. In addition, northern WCA 3A lacks the diversity of communities that exists in southern WCA 3A. In southern WCA 3A, Wood and Tanner (1990) documented the trend toward deep water lily dominated sloughs due to impoundment. In approximately 1991, the hydrology of southern WCA 3A shifted to the deeper water and extended hydroperiods of the new, wet hydrologic era resulting in a northward shift in slough vegetation communities within the WCA 3A impoundment (Zweig and Kitchens 2008). Typical Everglades vegetation, including tree islands, wet prairies, sawgrass marshes and aquatic sloughs also occur throughout WCA 3B. However, within WCA 3B, the ridge and slough landscape has been severely degraded by the virtual elimination of overland sheetflow due to the L-67 canal and levee system. WCA 3B experiences very little overland flow and has become primarily a rain-fed system predominated by shorter hydroperiod sawgrass marshes with relatively few sloughs or tree islands remaining. Water levels in WCA 3B are also too low and do not vary seasonally, contributing to poor ridge and slough patterning. Loss of sheetflow to WCA 3B has also accelerated soil loss reducing elevations of the remaining tree islands in WCA-3B and making them vulnerable to high water stages.

Vegetative trends in ENP have included a substantial shift from the longer hydroperiod slough/open water marsh communities to shorter hydroperiod sawgrass marshes (Davis and Ogden 1997, Armentano et al. 2006). Flows through Shark River Slough under current system compartmentalization and water

management practices are greatly reduced when compared with pre-drainage conditions. The result has been lower wet season depths and more frequent and severe dry downs in sloughs and reduction in extent of shallow water edges (McVoy et al. 2011). Over-drainage in the peripheral wetlands along the eastern flank of (NESRS) has resulted in shifts in community composition, invasion by exotic woody species and increased susceptibility to fire. Areas within the eastern marl prairies along the boundary of ENP suffer from over-drainage, reduced water flow, exotic tree invasion and frequent human-induced fires (Lockwood et al. 2003; Ross et al. 2006). In addition, invasion of sawgrass marshes and wet prairies by exotic woody species has led to the conversion of some marsh communities to forested wetlands (Gunderson et. al. 1997).

In contrast to the vast extent of wetland communities, upland communities comprise a relatively small component of the Everglades landscape and are largely restricted to Long Pine Key, the northern shores of Florida Bay, and the many tree islands scattered throughout the region. Vegetative communities of Long Pine Key include rockland pine forest and tropical hardwood forest. In addition, substantial areas of tropical hardwood hammock occur along the northern shores of Florida Bay and on elevated portions of some forested islands.

The estuarine communities of Florida Bay have also been affected by upstream changes in freshwater flows through the Everglades. A reduction in freshwater inflows into Florida Bay and alterations of the normal salinity balance have affected mangrove community composition and may have contributed to a large-scale die-off of seagrass beds (USFWS 1999).

6.1.1.1 Slough/Open Water Marsh

The slough/open water marsh community occurs in the lowest, wettest areas of the Everglades. This community is a complex of open water marshes containing emergent, floating aquatic, and submerged aquatic vegetation components. The emergent marsh vegetation is typically dominated by spikerushes (*Eleocharis cellulosa* and *E. elongata*), beakrushes (*Rhynchospora tracyi* and *R. inundata*), and maidencane (*Panicum hemitomon*). Common floating aquatic dominants include fragrant water lily (*Nymphaea odorata*), floating hearts (*Nymphoides aquatica*), and spatterdock (*Nuphar lutea*); and the submerged aquatic community is typically dominated by bladderwort (*Utricularia foliosa*) and periphyton. As shown by Davis et al. (1997), vegetative trends in the ENP have included the conversion of slough/open water marsh communities to shorter hydroperiod sawgrass marshes.

6.1.1.2 Sawgrass Marsh

Sawgrass marshes are dominated by dense to sparse stands of *Cladium jamaicense*. Sawgrass marshes occurring on deep organic soils (more than one meter) form tall, dense, nearly monospecific stands. Sawgrass marshes occurring on shallow organic soils (less than one meter) form sparse, short stands that contain additional herbaceous species such as spikerush, water hyssop (*Bacopa caroliniana*), and marsh mermaid weed (*Proserpinaca palustris*) (Gunderson et al. 1997). The adaptations of sawgrass to flooding, burning, and oligotrophic conditions contribute to its dominance of the Everglades vegetation. Sawgrass-dominated marshes once covered an estimated 300,000 acres of the Everglades. Approximately 70,000 acres of tall, monospecific sawgrass marshes have been converted to agriculture in the EAA. Urban encroachment from the east and development within other portions of the Everglades has consumed an additional 79,000 acres of sawgrass-dominated communities (Davis and Ogden 1997).

6.1.1.3 Wet Marl Prairie

Wet marl prairies occur on marl soils and exposed limestone and experience the shortest hydroperiods of the slough/marsh/prairie wetland complex. Marl prairie is a sparsely vegetated community that is typically dominated by muhly grass (*Muhlenbergia capillaris*) and short-stature sawgrass. Additional important constituents include black sedge (*Schoenus nigricans*), arrowfeather (*Aristida purpurascens*), Florida little bluestem (Schizachyri*um rhizomatum*), and Elliot's lovegrass (*Eragrostis elliottii*). Marl prairie is found on marl substrates. Marls are fine, white, calcareous muds formed from calcite precipitated by a mixture of green algae, bole green algae, and diatoms, known as periphyton. Periphyton mats that grow loosely attached to the vegetation and exposed limestone are an important component of this community. Marl prairies occur in the southern Everglades along the eastern and western periphery of SRS. Approximately 146,000 acres of the eastern marl prairie have been lost to urban and agricultural encroachment (Davis and Ogden 1997). Tree Islands

Tree islands occur within the freshwater marshes in areas of slightly higher elevation relative to the surrounding marsh. The lower portions of tree islands are dominated by hydrophytic, evergreen, broad-leaved hardwoods such as red bay (*Persea palustris*), sweetbay, dahoon holly (*Ilex cassine*), and pond apple (*Annona glabra)*. Tree islands typically have a dense shrub layer that is dominated by coco-plum (*Chrysobalanus icaco*). Additional constituents of the shrub layer commonly include buttonbush and large leather fern (*Acrostichum danaeifolium*). Elevated areas on the upstream side of some tree islands may contain an upland tropical hardwood hammock community dominated by species of West Indian origin (Gunderson et al. 1997), with species composition shifting toward the north toward more temperate hardwood hammock species. Extended periods of flooding may result in tree mortality and conversion to a non-forested community. In the over-drained areas of WCA 3A, historic wildfires have consumed tree island vegetation and soils. Overall, the spatial extent of tree islands in WCA 3 declined by 61% between 1940 and 1995 (Patterson and Finck 1999). Portions of the WCAs have been flooded to the extent that many forested islands have lost all tropical hardwood hammock trees. Tree islands are considered an extremely important contributor to habitat heterogeneity and overall species diversity within the Everglades ecosystem because they provide nesting habitat and refugia for birds and upland species and serve as hotspots of plant species diversity within the Greater Everglades (Sklar and van der Valk 2002, USFWS 1999). Tree islands also contain extraordinarily high levels of total phosphorus in their soil suggesting that they may play a major role in the biogeochemical cycles of nutrients in the Everglades (Troxler and Childers 2010; Wetzel et al. 2009, 2011). Wetzel et al. (2011) found that soil total phosphorus levels within WCA 3A and WCA 3B tree islands were approximately 4 times higher than the surrounding marsh total phosphorus levels. Tree islands within WCA 3B may help to capture and focus nutrients, assisting to minimize potential effects on sawgrass and wet prairie communities within this region (Wetzel et al. 2011).

6.1.1.4 Mangroves

Mangrove communities are forested wetlands occurring in intertidal, low-wave-energy, estuarine and marine environments. Within the action area, extensive mangrove communities occur in the intertidal zone of Florida Bay. Mangrove forests have a dense canopy dominated by four species: red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), white mangrove (*Laguncularia racemosa*), and buttonwood (*Conocarpus erectus*). Mangrove communities occur within a range of salinities from 0 to 40 parts per thousand (ppt). Florida Bay experiences salinities in excess of 40 ppt on a seasonal basis. Declines in freshwater flow through the Everglades have altered the salinity balance and species composition of mangrove communities within Florida Bay. Changes in freshwater flow can lead to an

invasion by exotic species such as Australian pine (*Casuarina equisetifolia*) and Brazilian pepper (*Schinus terebinthifolius*).

6.1.1.5 Seagrass Beds

Seagrasses are submerged vascular plants that form dense rooted beds in shallow estuarine and marine environments. This community occurs in sub tidal areas that experience moderate wave energy. Within the action area, extensive seagrass beds occur in Florida Bay. The most abundant seagrasses in south *Florida are turtle grass (Thalassia testudinum), manatee grass (Syringodium filiforme), and shoal grass (Halodule wrightii*). Additional species include star grass (*Halophila engelmannii*), paddle grass (*Halophila decipiens*), and Johnson's seagrass (*Halophila johnsonii*). Widgeon grass may also occur in seagrass beds in areas of low salinity. Seagrasses have an optimum salinity range of 24 to 35 ppt, but can tolerate considerable short term salinity fluctuations. Large-scale seagrass die-off has occurred in Florida Bay since 1987, with over 18% of the total bay area affected. Suspected causes of seagrass mortality include high salinities and temperatures during the 1980s and long-term reductions of freshwater inflow to Florida Bay (RECOVER 2009).

6.1.1.6 Rockland Pine Forest

In Florida, pine rocklands are located on the Miami Rock Ridge in present day Miami and in ENP, in the Florida Keys, and in the Big Cypress Swamp. Pine rocklands differ to some degree between and within these areas with regard to substrate (*e.g.* amount of exposed limestone, type of soil), elevation, hydrology, and species composition (both plant and animal). Pine rocklands occur in a mosaic with primarily two other natural community types; rockland hammock and marl prairie. Pine rocklands grade into rockland hammock; pine rocklands have an open pine canopy and rockland hammock has a closed, hardwood canopy. Marl prairies differ from pine rocklands in having no pines, an understory dominated by grasses and sedges, and a minimal cover of shrubs.

Pine rocklands within the action area occur on the Miami Rock Ridge and extend into the Everglades as Long Pine Key. Pine rocklands occur on relatively flat terrain with moderately to well-drained soils. Limestone bedrock is close to the surface and the soils are typically shallow accumulations of sand, marl, and organic material in depressions and crevices in the rock surface. Pine rockland is an open, savanna-like community with a canopy of scattered south Florida slash pine (P*inus elliottii var. densa*) and an open, low-stature understory. Most sites are wet for only short periods following heavy rains (Florida Natural Areas Inventory 1990). During the rainy season, however, some sites may be shallowly inundated by slow flowing surface water for up to 60 days per year. This is a fire-maintained community that requires regular burns to maintain the open shrub/herbaceous stratum and to control hardwood encroachment (Gunderson et. al1997). The over story is comprised of scattered south Florida slash pines. The shrub layer is comprised of a diverse assemblage of tropical and temperate species. Common shrubs include cabbage palm (*Sabal palmetto*), coco-plum (*Chrysobalanus icaco*), myrsine (*Rapanea punctata*), saw palmetto (*Serenoa repens*), southern sumac (*Rhus copallinum*), strangler fig (*Ficus aurea*), swamp bay (*Persea palustris*), wax myrtle (*Myrica cerifera*), white indigo berry (*Randia aculeata*), and willow-bustic (*Sideroxylon salicifolium*). The herbaceous stratum is comprised of a very diverse assemblage of grasses, sedges, and forbs. Common herbaceous species include crimson bluestem (*Schizachyrium sanguineum*), wire bluestem (*Schizachyrium gracile*), hairy bluestem (*Andropogon longiberbis*), bushy bluestem (*Andropogon glomeratus var. pumilis*), candyweed (Polygala grandiflora), creeping morning-glory (*Evolvulus sericeus*), pineland heliotrope (*Heliotropium polyphyllum*), rabbit bells (*Crotolaria rotundifolia*), and thistle (*Cirsium horridulum*) (USFWS 1999). This community occurs on areas of relatively high

elevation and consequently, has been subject to intense development pressure. In addition, fragmentation, fire suppression, invasion by exotic species, and a lowered water table have negatively affected the remaining tracts of pine rockland (USFWS 1999).

Pine rocklands were historically found in Miami-Dade County along the Miami Rock ridge from approximately North Miami Beach south and west to Long Pine Key in ENP. Pine rocklands in the Florida Keys are now restricted to the Lower Keys. Significant tracts of pine rocklands occur on Big Pine Key, No Name Key, Little Pine Key, Cudjoe Key, and Upper Sugarloaf Key in Monroe County. They also occur in southern BCNP (USFWS 1999). The largest remaining contiguous areas of pine rockland are found in Long Pine Key in ENP, on Big Pine Key and in southern BCNP. Small pine rockland fragments also persist along the Miami Rock Ridge from Florida City north to approximately Southwest 32nd Street in Miami-Dade County (USFWS 1999). There are noticeable differences in species composition between the pine rocklands found in the Florida Keys and the mainland. The shrub layer in pine rocklands occurring in the northern end of the Miami Rock ridge more closely resembles pine flatwoods as a result of the amount of sandy soils in the area. Pine rocklands in the lower Florida Keys have a sub canopy composed of several palms and hardwoods. Pine rocklands on the mainland have a more diverse herbaceous layer due to the presence of temperate species and some tropical species that do not occur in the Florida Keys.

Pine rocklands are maintained by regular fire and are susceptible to other natural disturbances such as hurricanes, frost events, and sea level rise. Fires historically burned on an interval of approximately every 3 to 7 years, and were typically started by lightning strikes. Above ground portions of hardwood shrubs are typically killed by fires; palms typically produce new growth post-fire. The amount of wood understory growth is directly related to the length of time since the last fire. Herbaceous diversity declines with time since last fire. Presently, prescribed fire must be periodically introduced into pine rocklands to sustain community structure, prevent invasion by woody species, maintain high herbaceous diversity and prevent succession to hardwood hammock.

6.1.1.7 Tropical Hardwood Hammock

Tropical hardwood hammocks occur on upland sites where limestone is near the surface. Tropical hardwood hammocks within the action area occur on the Miami Rock Ridge, along the northern shores of Florida Bay and on elevated outcrops on the upstream side of tree islands. This community consists of a closed canopy forest dominated by a diverse assemblage of hardwood tree species, a relatively open shrub layer, and a sparse herbaceous stratum. This community is dominated by West Indian species and contains numerous species whose entire United States distribution is limited to tropical hammocks of south Florida. Common canopy species include gumbo-limbo (*Bursera simaruba*), paradise tree (*Simarouba glauca*), pigeon-plum (*Coccoloba diversifolia*), strangler fig, wild mastic *(Sideroxylon foetidissimum*), willow-bustic, live oak (*Quercus virginiana*), short-leaf fig (*Ficus citrifolia*), and wild tamarind (*Lysiloma bahamense*). Common understory species include black ironwood (*Krugiodendron ferreum)*, inkwood (*Exothea paniculata*), lancewood (*Ocotea coriacea*), marlberry (*Ardisia escallonoides*), poisonwood (*Metopium toxiferum*), satinleaf (*Chrysophyllum oliviforme*), and white stopper (*Eugenia axillaris*). Common species of the sparse shrub/herbaceous layer include shiny-leaf wild-coffee (*Psychotria nervosa*), rouge plant (*Rivinia humilis*), false mint (*Dicliptera sexangularis*), bamboo grass (*Lasciacis divaricata*), and woods grass (*Oplismenus hirtellus*). This community occurs on areas of relatively high elevation and consequently, has been subject to intense development pressure. Fragmentation of remaining tracts, invasion by exotic species, and alterations of water table elevations have also had negative impacts on this community. Tropical hardwood hammocks on the Miami Rock Ridge have been affected by a lowered water table associated with the reduction of freshwater flow

through the Everglades. In contrast, tree islands in the WCAs have been flooded to the extent that many have lost all tropical hardwood hammock trees.

6.1.2 Fish and Wildlife Species

Aquatic macro invertebrates form a vital link between the algal and detrital food web base of freshwater wetlands and the fishes, amphibians, reptiles, and wading birds that feed upon them. Important macro invertebrates of the freshwater aquatic community include crayfish (*Procambarus alleni*), riverine grass shrimp (*Palaemonetes paludosus*), amphipods (*Hyallela aztecus*), Florida apple snail (*Pomacea paludosa*), Seminole ramshorn (*Planorbella duryi*), and numerous species of aquatic insects (USACE 1999).

Small freshwater marsh fishes are also important processors of algae, plankton, macrophytes, and macro invertebrates. Marsh fishes provide an important food source for wading birds, amphibians, and reptiles. Common small freshwater marsh species include the native and introduced golden topminnow (*Fundulus chrysotus*), least killifish (*Heterandria formosa*), Florida flagfish (*Jordenella floridae*), golden shiner (*Notemigonus crysoleucas*), sailfin molly (*Poecilia latipinna*), bluefin killifish (*Lucania goodei*), oscar (*Astronotus ocellatus*), eastern mosquitofish (*Gambusia holbrookii*), and small sunfishes (*Lepomis spp.)* (USACE 1999). The density and distribution of marsh fish populations fluctuates with seasonal changes in water levels. Populations of marsh fishes increase during extended periods of continuous flooding during the wet season. As marsh surface waters recede during the dry season, marsh fishes become concentrated in areas that hold water through the dry season. Concentrated dry season assemblages of marsh fishes are more susceptible to predation and provide an important food source for wading birds (USACE 1999).

Within the Greater Everglades, numerous sport and larger predatory fishes occur in deeper canals and sloughs. Common species include largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus)*, redear sunfish (*Lepomis microlophus*), black crappie (*Pomoxis nigromaculatus*), Florida gar (*Lepisosteus platyrhincus*), threadfin shad (*Dorosoma petenense*), gizzard shad (*Dorosoma cepedianum*), yellow bullhead (*Ameiurus natilis*), white catfish (*Ameiurus catus*), bowfin (*Amia calva*), and tilapia (*Tilapia spp*.) (USACE 1999). Larger fishes are an important food source for wading birds, alligators, otters, raccoons, and mink.

The freshwater wetland complex supports a diverse assemblage of reptiles and amphibians. Common amphibians include the greater siren (*Siren lacertina*), Everglades dwarf siren (*Pseudobranchus striatus*), two-toed amphiuma (*Amphiuma means*), pig frog (*Rana grylio*), southern leopard frog (*Rana sphenocephala)*, Florida cricket frog (*Acris gryllus*), southern chorus frog (*Pseudacris nigrita*), squirrel tree frog (*Hyla squirela*), and green tree frog (*Hyla cinerea*) (USACE 1999). Amphibians represent an important forage base for wading birds, alligators, and larger predatory fishes (USACE 1999).

Common reptiles of freshwater wetlands include the American alligator (*Alligator mississippiensis*), snapping turtle (*Chelydra serpentina*), striped mud turtle (*Kinosternon bauri*), mud turtle (*Kinosternon subrubrum*), cooter (*Chrysemys floridana*), Florida chicken turtle (*Deirochelys reticularia*), Florida softshell turtle (*Trionys ferox*), water snake (*Natrix sipidon*), green water snake (*Natrix cyclopion*), mud snake (*Francia abacura*), and Florida cottonmouth (*Agkistrodon piscivorus*) (USACE 1999).

The alligator was historically most abundant in the peripheral Everglades marshes and freshwater mangrove habitats, but is now most abundant in canals and the deeper slough habitats of the central Everglades. Drainage of peripheral wetlands and increasing salinity in mangrove wetlands as a result of

decreased freshwater flows has limited the occurrence of alligators in these habitats (Mazzotti and Brandt 1994).

The freshwater wetlands of the Everglades are noted for their abundance and diversity of colonial wading birds. Common wading birds include the white ibis (*Eudocimus albus*), glossy ibis (*Plegadus falcenellus*), great egret (*Casmerodius albus*), great blue heron (*Ardea herodius*), little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), snowy egret (*Egretta thula*), green-backed heron (*Butorides striatus*), cattle egret (*Bubulcus ibis*), black-crowned night heron (*Nycticorax nycticorax*), yellow-crowned night heron (*Nycticorax violacea*), roseate spoonbill (*Ajaia ajaja*), and wood stork (*Mycteria americana*) (USACE 1999). The number of wading birds nesting in the Everglades has decreased by approximately 90 percent, and the distribution of breeding birds has shifted away from ENP into the WCAs (Bancroft et al. 1994). The WCAs support fewer numbers of breeding pairs with relatively lower reproductive success (USACE 1999). Water management practices and wetland losses are believed to be the primary cause of the declines (Bancroft et al. 1994).

Mammals that are well-adapted to the aquatic and wetland conditions of the freshwater marsh complex include the rice rat (*Oryzomys palustris natator*), round-tailed muskrat, and river otter (*Lutra canadensis*). Additional mammals that may utilize freshwater wetlands on a temporary basis include the white-tailed deer (*Odocoileus virginianus*), Florida panther (*Puma concolor coryi*), bobcat (*Lynx rufus*), and raccoon (*Procyon lotor*).

6.1.3 Federally Listed Species

The Corps has coordinated the existence of federally listed species with the USFWS and with NMFS, as appropriate. Specifically, coordination with NMFS includes listed fish and sea turtles at sea. Coordination with USFWS includes other listed plants and animals. The Corps requested written confirmation of federally listed threatened and endangered species that are either known to occur or are likely to occur within the project area from the USFWS by correspondence dated November 20, 2017. A revised species list was provided by the USFWS through correspondence dated December 27, 2017. Thirty six federally listed threatened and endangered species under the purview of the USFWS are either known to exist or potentially exist within the action area. This includes one candidate species. Effects determinations are listed in **TABLE 3**. Many of these species have been previously affected by habitat impacts resulting from wetland drainage, alteration of hydroperiod, wildfire and water quality degradation.

TABLE 3. STATUS OF FEDERALLY THREATENED AND ENDANGERED SPECIES UNDER USFFWS' JURISDICTION WITH THE POTENTIAL TO OCCUR WITHIN THE CEPP SOUTH ACTION AREA AND THE CORPS' EFFECTS DETERMINATION (E: ENDANGERED; T: THREATENED; SA: SIMILARITY OF APPEARANCE; CH: CRITICAL HABITAT, C: CANDIDATE SPECIES)

Common Name	Scientific Name	Status	May Affect Not Likely to Adversely Affect	May Affect	No Effect
Mammals					
Florida panther	*Puma concolor coryi*	E	X		
Florida manatee	*Trichechus manatus latirostris*	E, CH	X		

Common Name	Scientific Name	Status	May Affect Not Likely to Adversely Affect	May Affect	No Effect
Florida bonneted bat	*Eumops floridanus*	E	X		
Birds					
Cape Sable seaside sparrow	*Ammodramus maritimus mirabilis*	E, CH		X	
Everglade snail kite	*Rostrhamus sociabilis plumbeus*	E, CH		X	
Piping plover	*Charadrius melodus*	T			X
Red-cockaded woodpecker	*Picoides borealis*	E			X
Roseate tern	*Sterna dougallii*	T			X
Wood stork	*Mycteria americana*	T		X	
Reptiles					
American Alligator	*Alligator mississippiensis*	T, SA	X		
American crocodile	*Crocodylus acutus*	T, CH	X		
Eastern indigo snake	*Drymarchon corais couperi*	T	X		
Gopher tortoise	*Gopherus polyphemus*	C			X
Invertebrates					
Bartram's hairstreak butterfly	*Strymon acis bartrami*	E, CH	X		
Florida leafwing butterfly	*Anaea troglodyta floridalis*	E, CH	X		
Miami blue butterfly	*Cyclargus thomasi bethunebakeri*	E			X
Schaus swallowtail butterfly	*Heraclides aristodemus ponceanus*	E			X
Stock Island tree snail	*Orthalicus reses (not incl. nesodryas)*	T			X
Plants					
Crenulate lead plant	*Amorpha crenulata*	E			X
Deltoid spurge	*Chamaesyce deltoidea spp. deltoidea*	E			X
Garber's spurge	*Chamaesyce garberi*	T	X		

Common Name	Scientific Name	Status	May Affect Not Likely to Adversely Affect	May Affect	No Effect
Okeechobee gourd	*Cucurbita okeechobeensis ssp. okeechobeenis*	E			X
Small's milkpea	*Galactia smallii*	E			X
Tiny polygala	*Polygala smallii*	E			X
Big pine partridge pea	*Chamaecrista lineata var. keyensis*	E			X
Blodgett's silverbush	*Argythamnia blodgettii*	T	X		
Cape Sable thoroughwort	*Chromolaena frustrata*	E, CH			X
Carter's small-flowered flax	*Linum carteri var. carteri*	E, CH			X
Everglades bully	*Sideroxylon reclinatum spp. austroflioridense*	T	X		
Florida brickell-bush	*Brickellia mosieri*	E, CH			X
Florida bristle fern	*Trichomanes punctatum spp. floridanum*	E			X
Florida pineland crabgrass	*Digitaria pauciflora*	T	X		
Florida prairie clover	*Dalea carthagenesis floridana*	E	X		
Florida semaphore cactus	*Consolea corallicola*	E, CH			X
Pineland sandmat	*Chaemaesyce deltoidea pinetorium*	T	X		
Sand flax	*Linum arenicola*	E			X

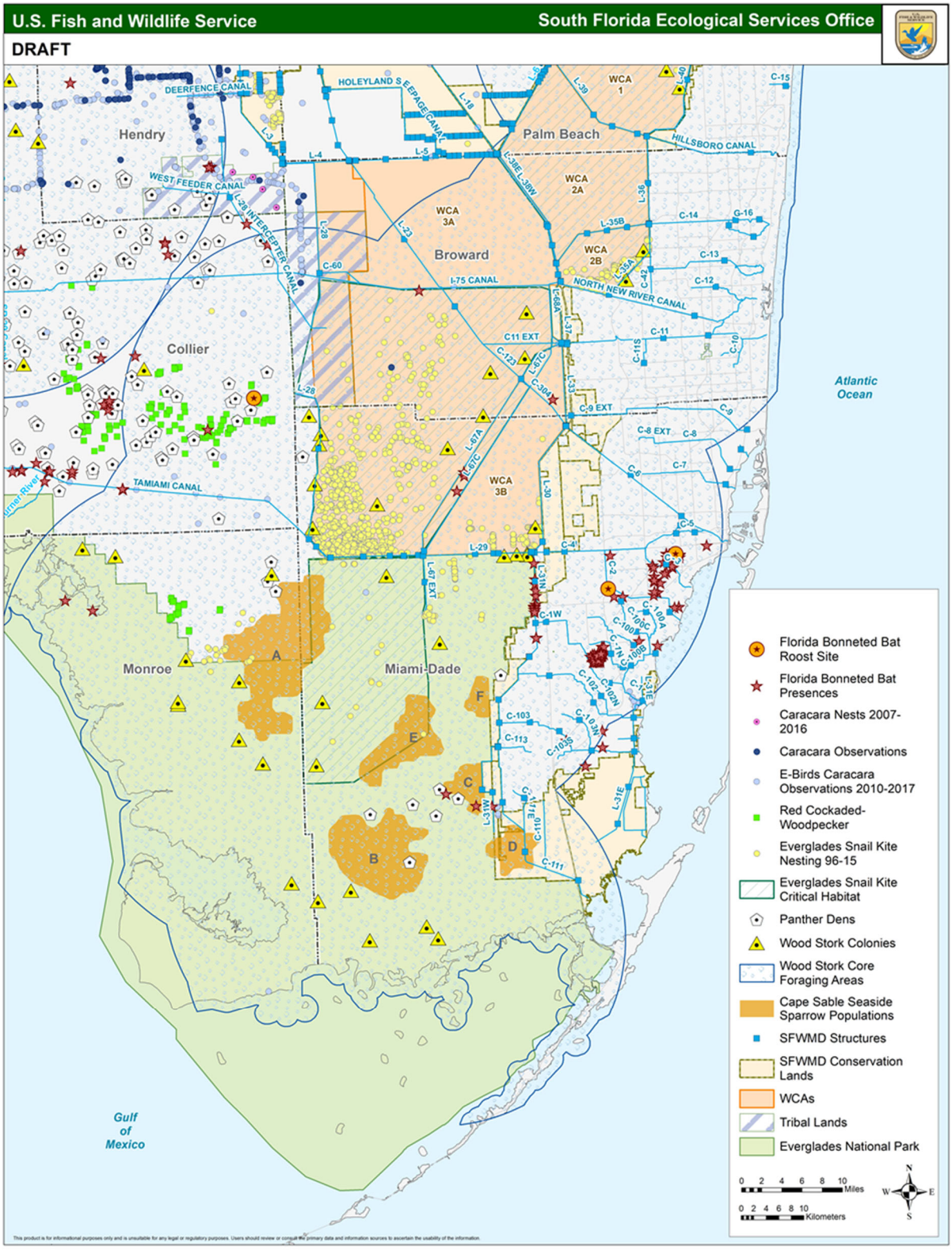


FIGURE 5. LOCATION OF FEDERALLY THREATENED AND ENDANGERED SPECIES WITH THE POTENTIAL TO OCCUR WITHIN THE CEPP SOUTH ACTION AREA

6.2 Designated Critical Habitat

In addition to threatened and endangered species, the action area also includes or is adjacent to designated critical habitat for several species in which a may affect not likely to adversely affect or a may affect determination was previously made within the 2013 CEPP BA (USACE 2013) or for which critical habitat was not previously consulted upon. This includes critical habitat for the Florida manatee, CSSS, snail kite, American crocodile, Bartram's hairstreak butterfly, Florida leafwing butterfly, Carter's small-flowered flax, Florida brickell-bush, and Florida semaphore cactus. Maps of critical habitat locations for these species are depicted in **FIGURE 6** through **FIGURE 11**.

In addition, the action area contains designated critical habitat for the green sea turtle, hawksbill sea turtle, leatherback sea turtle, and Johnson's seagrass. Features identified in CEPP South have not been subsequently modified in a manner that causes an effect to listed species or critical habitat that is not considered within the 2013 Programmatic BO for CERP previously provided by NMFS. There has been no change in the operational intent of CEPP South that would require the need to re-initiate consultation with NMFS since completion of the prior resource agency consultation.

6.2.1 Florida Manatee Critical Habitat

Critical habitat was designated for the Florida manatee (listed in that regulation as *Trichechus manatus*) on September 24, 1976 (41 FR 41914) with a final correction on September 27, 1977 (42 FR 47840-47845). Critical habitat in Florida that is in the CEPP South action area includes all U.S. territorial waters adjoining the coast and islands and all connected bays, estuaries, and rivers from Gordon's Pass, near Naples, Collier County, southward to and including Whitewater Bay, Monroe County; all waters of Card, Barnes, Blackwater, Little Blackwater, Manatee, and Buttonwood Sounds between Key Largo, Monroe County, and the mainland of Dade County; Biscayne Bay, and all adjoining and connected lakes, rivers, canals, and waterways from the southern tip of Key Biscayne northward to and including Maule Lake, Dade County. **FIGURE 6** illustrates a map created from the physical description of the published designated critical habitat. Primary constituent elements for manatee critical habitat have not been defined.

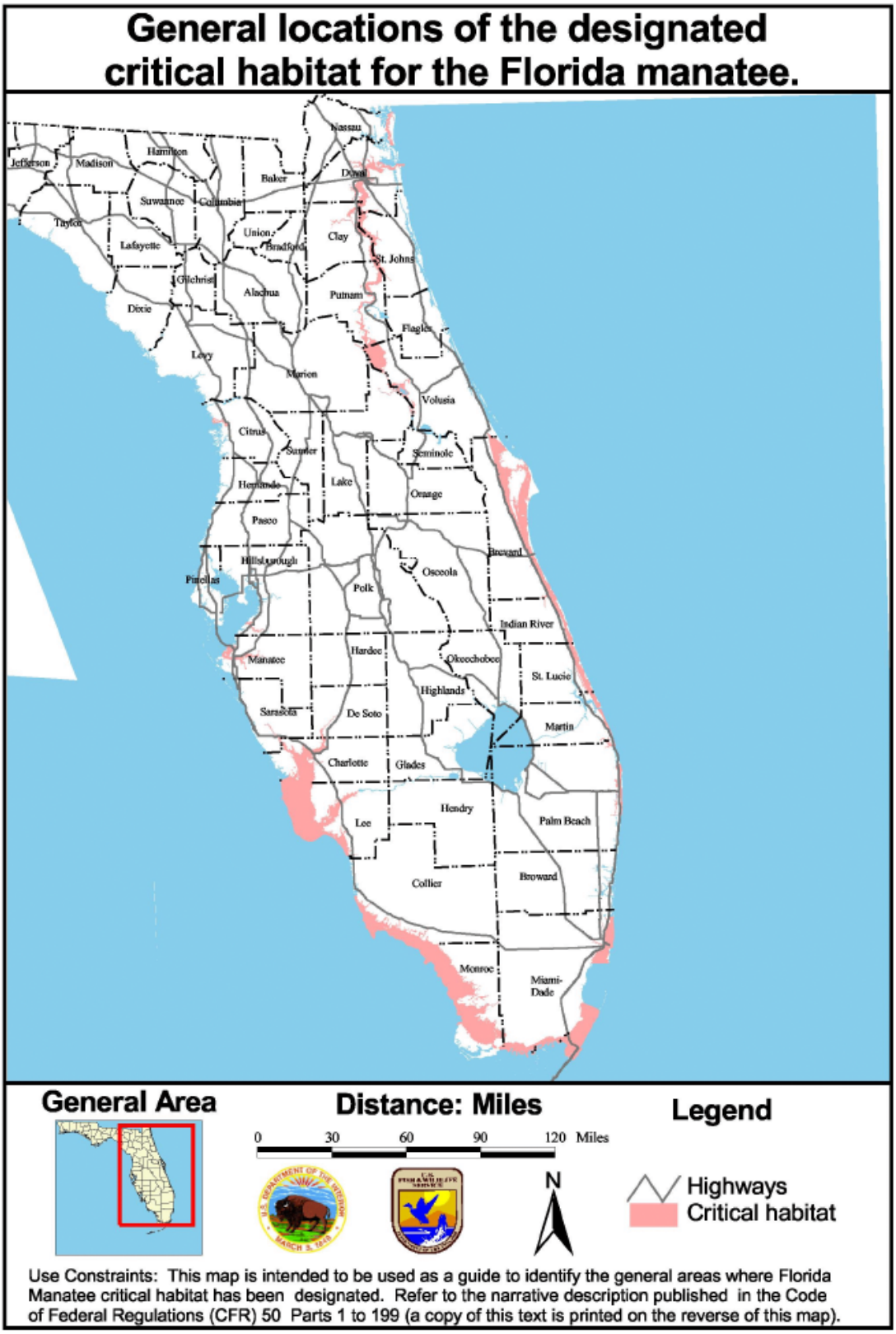


FIGURE 6. CRITICAL HABITAT FOR THE FLORIDA MANATEE

6.2.2 Cape Sable Seaside Sparrow Critical Habitat

Designated critical habitat for the CSSS include areas of land, water, and airspace in the Taylor Slough vicinity of Collier, Dade, and Monroe counties, with the following components: those portions of ENP within T57S R36E, T57S R36E, T57S R37E, T58S R35E, T58S R36E, T58S R37E, T58S R35E, T58S R36E, T59S R35E, T59S R36E, T59S R37E. Areas outside of ENP within T55S R37E Sec. 36; T55S R38E Sec. 31, 32; T56S R37E Sec. 1, 2, 11-14, 23-26; T56S R38E Sec. 5-7, 18, 19; T57S R37E Sec. 5-8; T58S R38E Sec. 27, 29-32; T59S R38E Sec. 4 (CFR Vol. 72, No. 214 / 11-6-07). Reference **FIGURE 7**. Designated CSSS critical habitat within the CEPP South action area includes ENP.

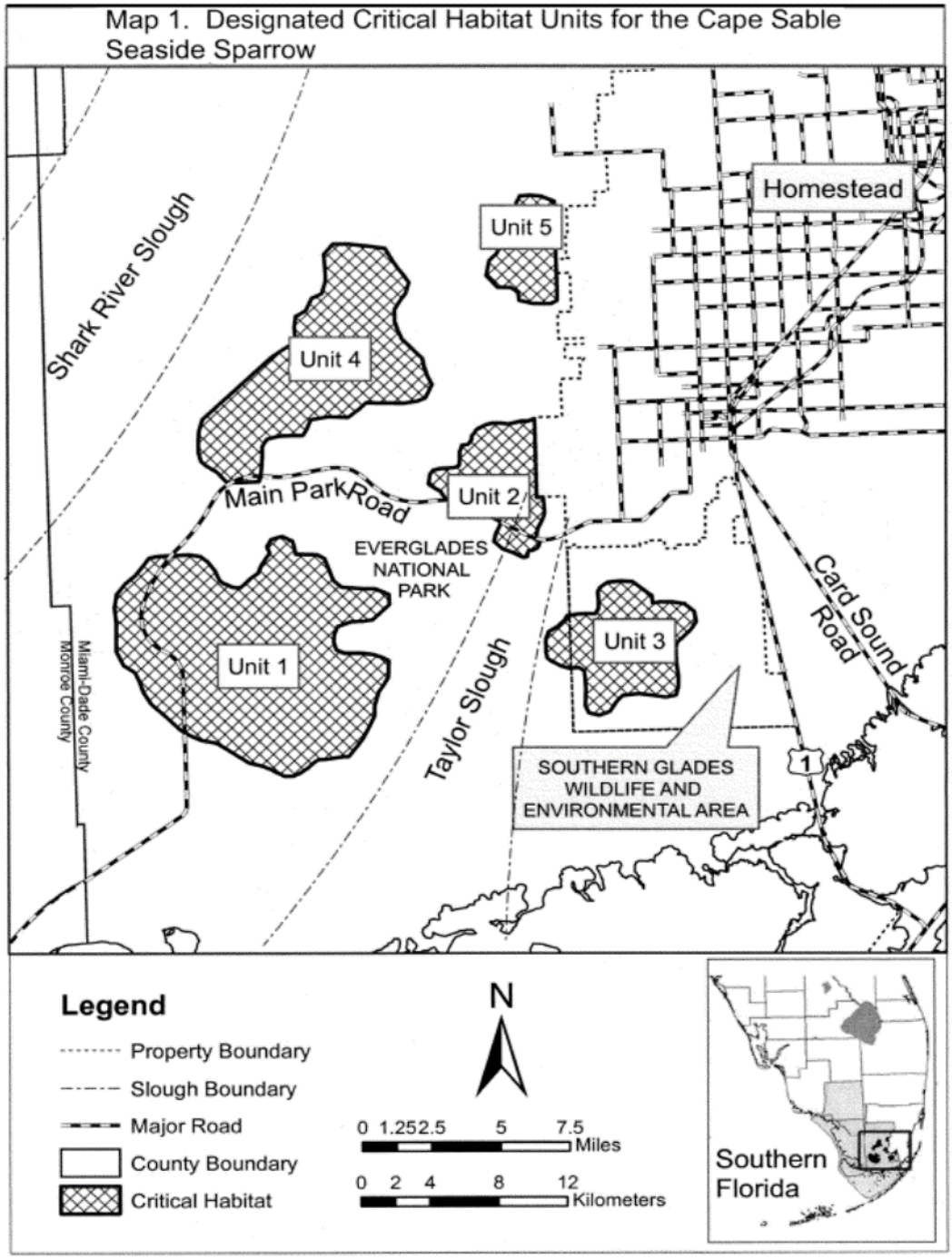


FIGURE 7. CRITICAL HABITAT FOR THE CAPE SABLE SEASIDE SPARROW

6.2.3 Everglade Snail Kite Critical Habitat

Critical habitat was designated for the Everglade Snail Kite on August 11, 1977 (41 FR 40685-40690) with a final correction on September 22, 1977 (42 FR 47840-47845). Critical habitat for the Everglade snail kite in Florida includes areas of land (predominantly marsh), water, and airspace, with the following components (Tallahassee Meridian): (1) St. Johns Reservoir, Indian River County: T33S R37E SW1/4 Sec.

6, W1/2 Sec. 7, Sec. 18, Sec 19.; (2) Cloud Lake Reservoir, St. Lucie County; T34S R38E S1/2 Sec. 16, N1/2 Sec. 21; (3) Strazulla Reservoir, St. Lucie County; T34S R38E SW1/4 Sec. 21; (4) western parts of Lake Okeechobee, Glades and Hendry Counties, extending along the western shore to the east of the levee system and the undiked high ground at Fisheating Creek, and from the Hurricane Gate at Clewiston northward to the mouth of the Kissimmee River, including all the *Elocharis* flats of Moonshine Bay, Monkey Box, and Observation Shoal, but excluding the open water north and west of the northern tip of Observation Shoal, north of Monkey Box, and east of Fisheating Bay; (5) Loxahatchee National Wildlife Refuge (WCA 1), Palm Beach County, including Refuge Management compartments A, B, C, and D, and all of the main portion of the Refuge as bounded by levees L-7, L-39, and L-40; (6) WCA 2A, Palm Beach and Broward Counties, as bounded by levees L-6, L-35B, L-36, L-38, and L-39; (7) WCA 2B, Broward County, as bounded by levee L-35, L-35B, L-36, and L-38; (8) WCA 3A, Broward and Miami-Dade Counties, as bounded by Florida Highway 84. Levees L-68A, L-67A (north of Miami Canal), and L-67C (south of Miami Canal). L-29 and L-28 and a line along the undiked northwestern portion of the area; (9) that portion of ENP, Miami-Dade County, within the following boundary; beginning at the point where ENP meets Florida Highway 94 in T54S R35 Sec. 20, thence eastward and southwest along the ENP boundary to the southwest corner of Sec. 2 in T58S R35E, thence westward along the south sides of Sec. 3, 4, 5, and 6 in T58S R35E to the Miami-Dade-Monroe County line, thence northward along the Miami-Dade-Monroe County line to the ENP boundary, thence eastward and northward along the ENP boundary to the point of beginning. Reference **FIGURE 8**. Primary constituent elements for snail kite critical habitat have not been defined.

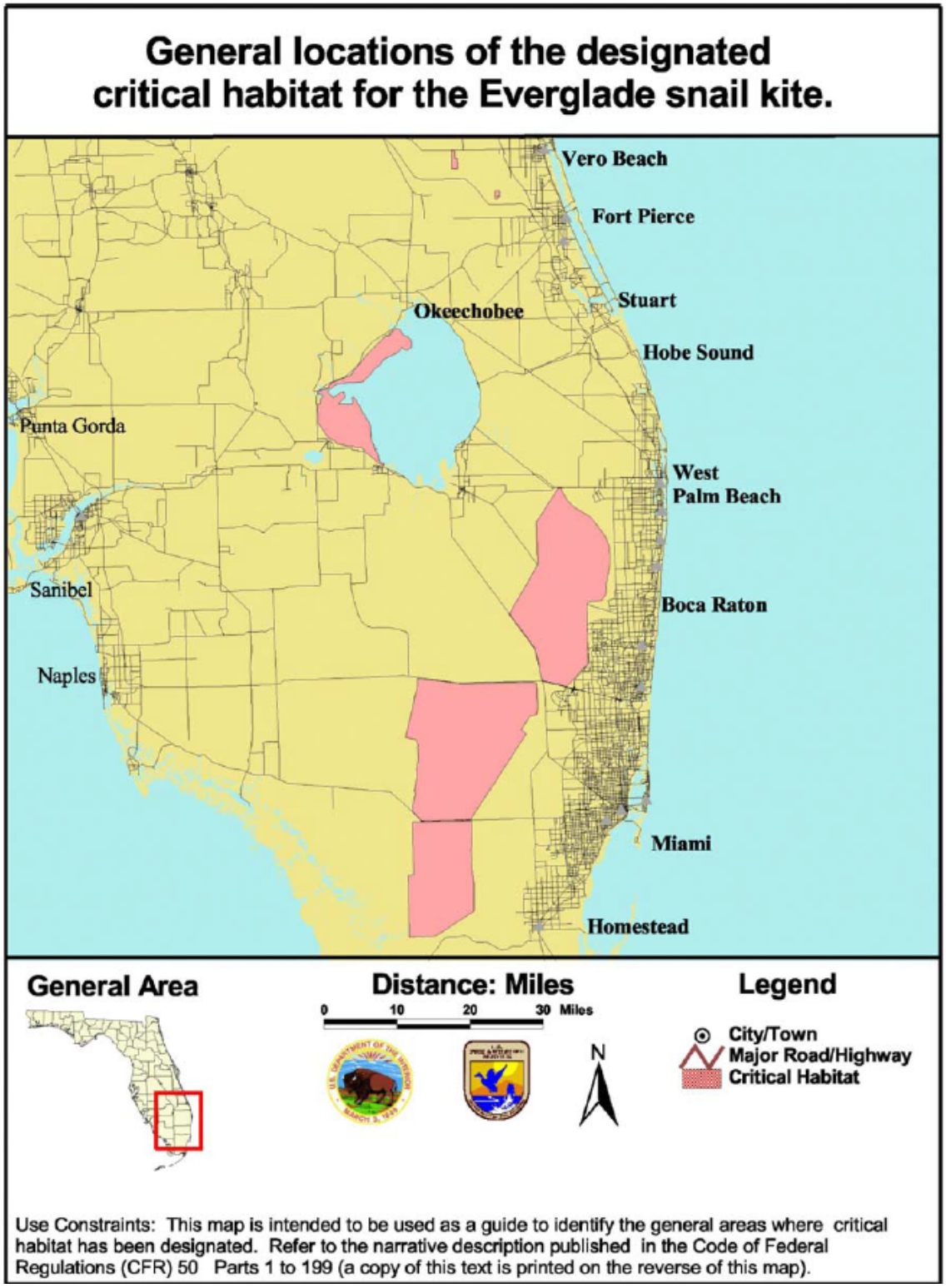


FIGURE 8. CRITICAL HABITAT FOR THE EVERGLADE SNAIL KITE

6.2.4 American Crocodile Critical Habitat

Critical habitat was designated for the American crocodile on September 24, 1976 (41 FR 41914) with a final correction on September 27, 1977 (42 FR 47840-47845). Critical habitat for the American crocodile within Florida includes all land and water within the following boundary: Beginning at the easternmost tip of Turkey Point, Dade County, on the coast of Biscayne Bay; then southeastward along a straight line to Christmas Point at the southernmost tip of Elliott Key; then southwestward along a line following the shores of the Atlantic Ocean side of Old Rhodes Key, Palo Alto Key, Angelfish Key, Key Largo, Plantation Key, Windley Key, Upper Matecumbe Key, Lower Matecumbe Key, and Long Key; then to the westernmost tip of Middle Cape; then northward along the shore of the Gulf of Mexico to the north side of the mouth of Little Sable Creek; then eastward along a straight line to the northernmost point of Nine-Mile Pond; then northeastward along a straight line to the point of beginning. Reference **FIGURE 9**.

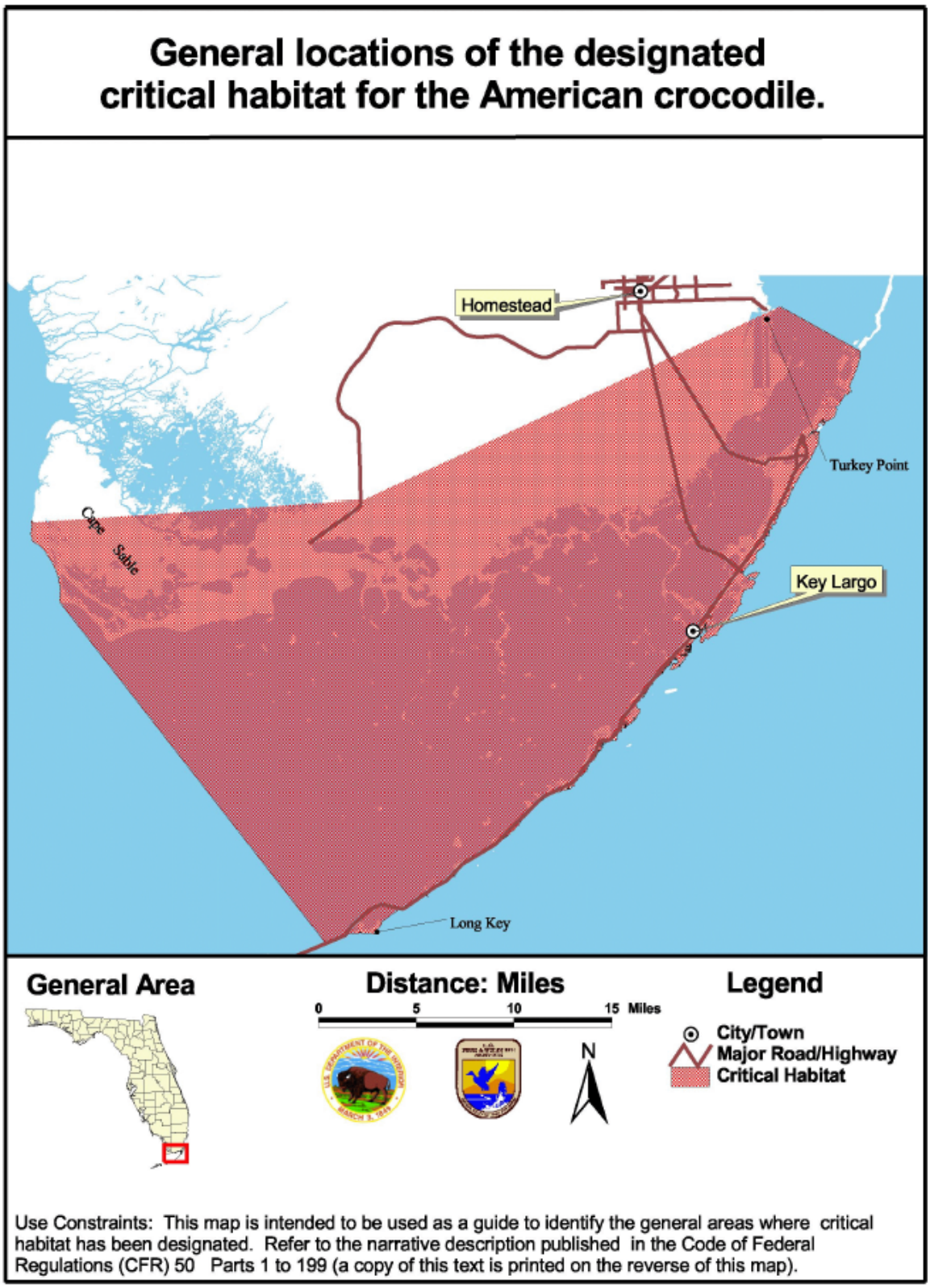


FIGURE 9. CRITICAL HABITAT FOR THE AMERICAN CROCODILE

6.2.5 Bartram's Hairstreak Butterfly and Florida Leaf Wing Butterfly Critical Habitat

Critical habitat was designated for Bartram's hairstreak butterfly and the Florida leaf wing butterfly on August 12, 2014 (79 FR 47183). Critical habitat for the Bartram's hairstreak butterfly consists of seven units consisting of 4,670 hectares (11,539 acres) in Miami-Dade and Monroe Counties. The seven units are: (1) BSHB1 ENP Miami-Dade County: (2) BSHB2 Navy Wells Pineland Preserve, Miami-Dade County; (3) BSHB3 Camp Owaissa Bauer, Miami-Dade County; (4) BSHB4 Richmond Pine Rocklands, Miami-Dade County; (5) BSHB5 Big Pine Key, Monroe County; (6) BSHB6 No Name Key, Monroe County; (7) BSHB7 Little Pine Key, Monroe County. Reference **FIGURE 10**. Critical habitat for the Florida leafwing butterfly consists of four units consisting 4,273 hectares (10,561 acres) in Miami-Dade and Monroe Counties. The four units are: (1) FLB1 ENP Miami-Dade County; (2) FLB2 Navy Wells Pineland Preserve, Miami-Dade County; (3) FLB3 Richmond Pine Rocklands, Miami-Dade County; and (4) FLB4 Big Pine Key, Monroe County. Reference **FIGURE 11**. Designated critical habitat for the Florida leafwing butterfly occurs entirely within Bartram's hairstreak units BSHB1, BSHB2, BSHB4, and BSHB5. Five of the seven critical habitat units (BSHB1-BSHB5) were identified as being occupied by the Bartram's hairstreak butterfly when critical habitat was designated. One of the four critical habitat units (FLB1) was identified as being occupied by the Florida leaf wing butterfly when critical habitat was designated. Primary constituent elements for Bartram's hairstreak butterfly and the Florida leaf wing butterfly have been defined and are further described in 79 FR 47813.

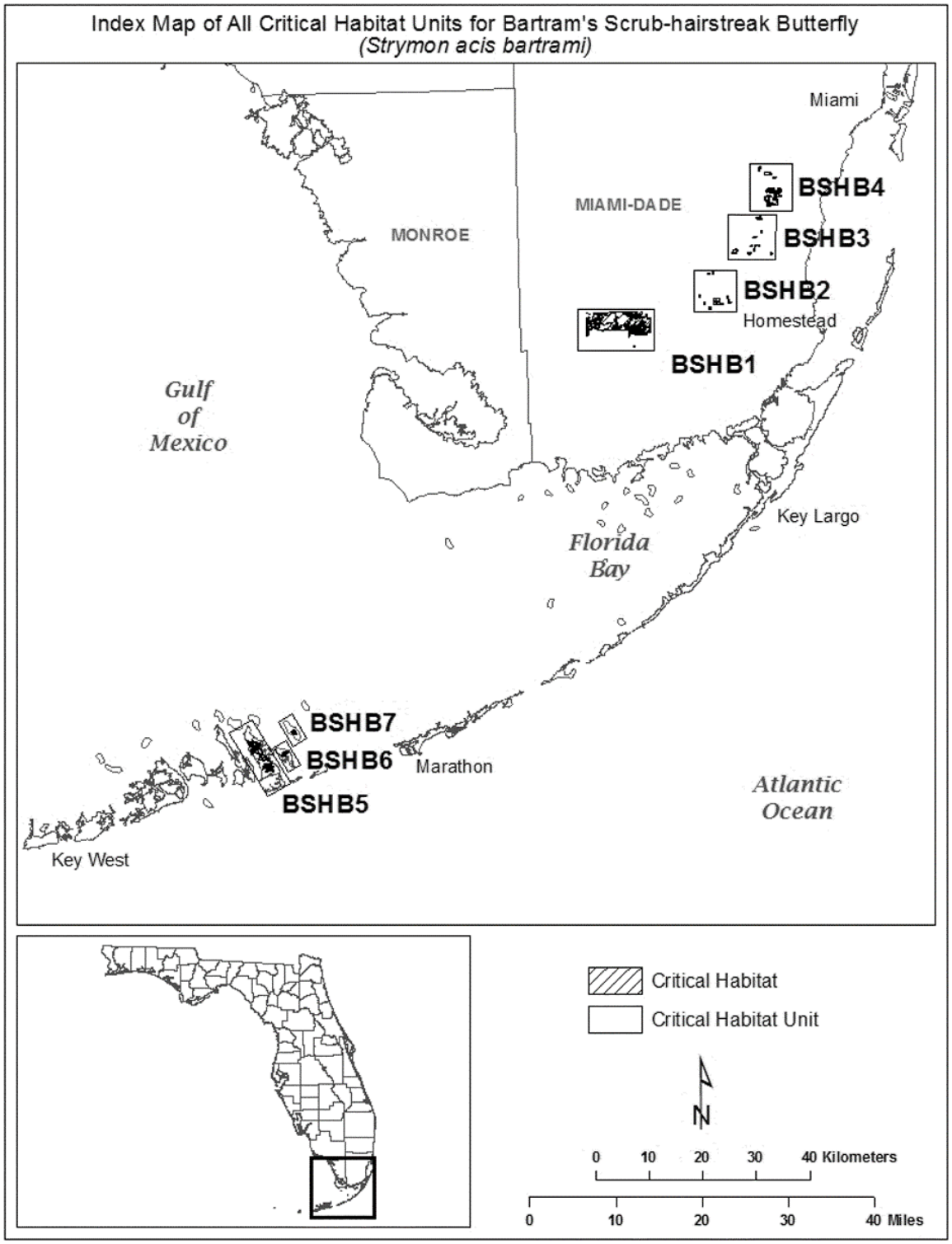


FIGURE 10. CRITICAL HABITAT FOR BARTRAM'S HAIRSTREAK BUTTERFLY

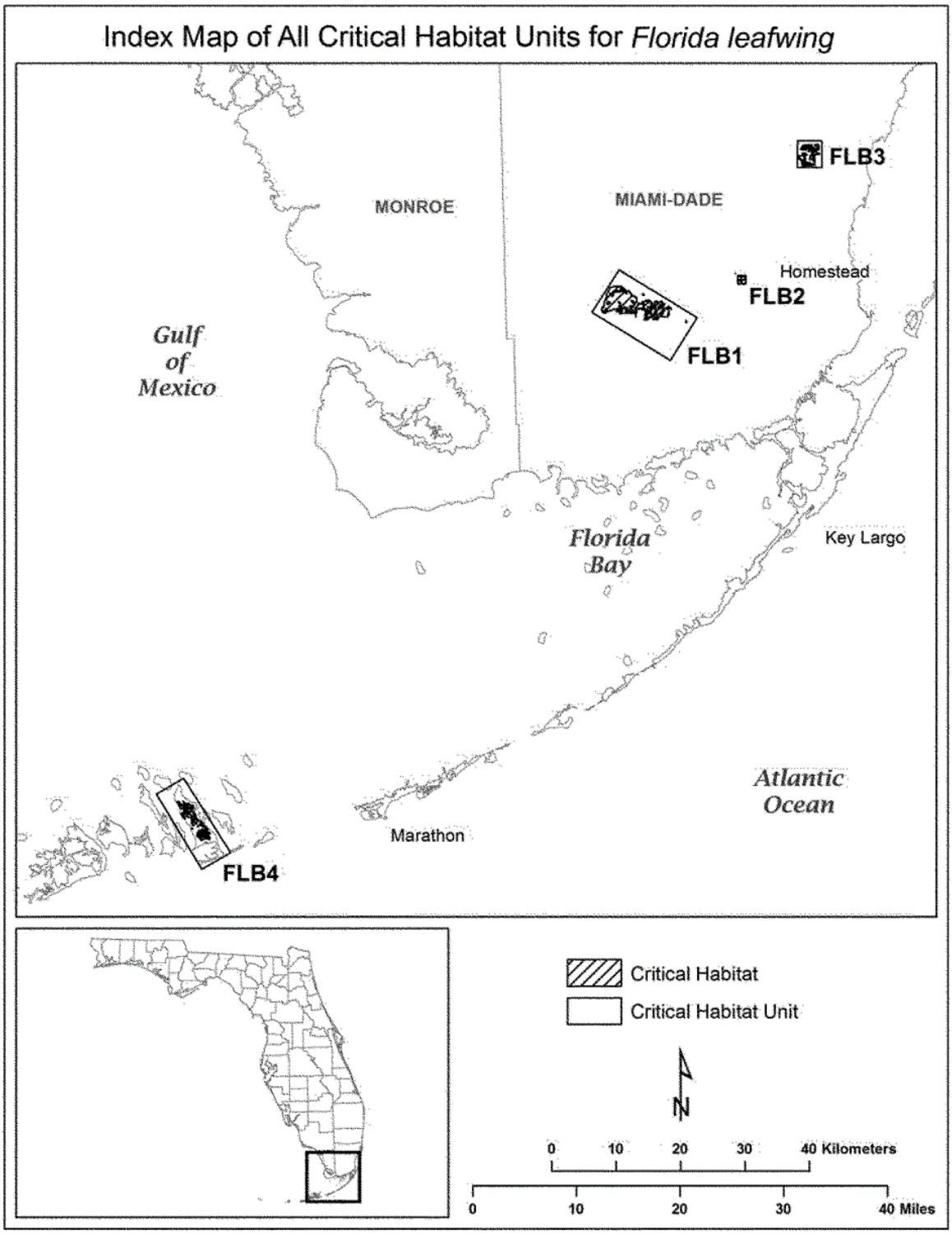


FIGURE 11. CRITICAL HABITAT FOR THE FLORIDA LEAFWING BUTTERFLY

6.3 Effects Determinations

6.3.1 "No Effect" Determination

The Corps reaffirms its "No Effect" determinations from the 2018 CEPP South BA for Federally threatened or endangered species as shown in **TABLE 3**; however changes have occurred that that require a revision to the determination for the deltoid spurge, Small's milkpea, and tiny polygala as discussed below.

The Florida bristle fern has the potential to occur within the pine rocklands of ENP on Long Pine Key, however it has not been observed in many years; therefore the Corps reaffirms its "No Effect" determination for this species as well. However proposed critical habitat for the Florida bristle fern in ENP is in review and expected to be published in early 2020 (USFWS South Florida Ecological Services Field Office Personnel Communication). The Corps will re-initiate consultation with the USFWS, if appropriate, at the time of final listing.

6.3.1.1 Deltoid Spurge, Small's Milkpea, and Tiny Polygala and "No Effect" Determination

Pine rocklands are the primary habitat for deltoid spurge, Small's milkpea, and tiny polygala. This community occurs on areas of relatively high elevation and consequently, has been subject to intense development pressure. In addition, pine rocklands are a fire-maintained community and require regular burns to maintain the open shrub/herbaceous stratum and to control hardwood encroachment (Gunderson 1997). Fire suppression, fragmentation, invasion by exotic species, and a lowered water table have negatively affected the remaining tracts of pine rocklands, prompting the listing of these species under the ESA (USFWS 1999).

The Deltoid spurge is a small perennial herb with many wiry stems radiating from a taproot. The herb forms mats or tufts up to 6 inches long over exposed limestone. Leaves are 0.25 inches long and are thick and rounded-triangular (deltoid) in shape. Leaves are opposite, smooth or sometimes hairy below, bright green, and have slightly rolled-under margins. Flowers are solitary and are in cup-like structures with tiny, petal-like glands (USFWS 1999). The Deltoid spurge is endemic to the pine rocklands of the Miami rock ridge and occurs only in Miami Dade County, Florida. The plant is historically known to occur in pine rocklands from the Goulds area north to the center of the city of Miami. The northern portion of its range has been completely modified by urban expansion (USFWS 1999). Results of a project to map the extant pine rockland habitat indicate that currently, the species is known to remain on 14 public lands (12 county, 1 State, 1 Federal) an undetermined number of private lands from southern Miami to Homestead (USFWS 2010b). The deltoid spurge tends to occur in areas with an open shrub canopy, exposed limestone, and minimal litter (pine needles, leaves, and other organic materials). It is most often found growing at the edges of sand pockets with plants growing both in sand (sometimes in association with tiny polygala) and on limestone. The survival and recovery of the Deltoid spurge is threatened by habitat loss from urban development, fire suppression, and exotic plant infestation (USFWS 1999).

The tiny polygala was listed as threatened by the USFWS on July 8, 1985 (50 FR 29345-29349). The tiny polygala is an erect short-lived herbaceous species. The tiny polygala forms a roseatte and grows no more than 8 cm tall. Flowers are small and numerous in a crowded head at the top of the stem. The plant contains 1-4 usually unbranched stems. Leaves are 0.5 inches wide and 2 inches long often taller than the flower heads, lance shaped and slightly wider toward the tip. Most plants germinate and die within one year. Seedlings can be observed from late October through April, but are most typically seen from December to February. Flowers appear throughout the year with a peak during the summer (USFWS

1999). The plant occurs in four distinct habitats with similar characteristics; pine rockland, scrub, high pine and open coastal spoil. All of these habitats are dry and prone to periodic natural fire. Within these habitats the plant requires high light levels and open sand with little to no organic litter accumulation. Prior to 1995, the tiny polygala was thought to be a local endemic of pine rocklands and scrub in Miami-Dade and Broward counties (the Miami and Fort Lauderdale metro areas, respectively); however extensive surveys conducted expanded the known range into northern Palm Beach and south central Martin Counties (USFWS 2010c). The plant is currently known to occur at eight sights within Miami-Dade, Palm Beach, Martin and St. Lucie Counties with the highest density of sites located in southern Miami-Dade County (USFWS 2010c). The survival and recovery of tiny polygala is threatened by habitat loss from urban development, fire suppression, and exotic plant infestation.

The small's milkpea is a small, trifoliate, perennial legume with small, purple flowers. The stems are grayish and grow up to 2 m long. The 1 to 2.2 cm long leaflets are broadly ovate to elliptic. Small's milkpea is a perennial legume that usually flowers during the summer months. The plant occurs in the pine rocklands of southern Miami-Dade County. At the time of its listing, Small's milkpea was only known at two sites near Homestead in Miami-Dade County. A 1994 survey found small's milkpea at seven additional sites on public land: Seminole Wayside, Navy Wells, Sunny Palms, Pine Island, Ned Glenn, Goulds, and the HRS site in Florida City/Miami-Dade County Park and Recreation Department is actively managing five of the six publicly owned sites. Small's milkpea was also found in small numbers on privately owned pine rockland fragments (USFWS 1999).

The Corps has determined that the Proposed Action would have no effect on the deltoid spurge, Small's milkpea, and tiny polygala. In the 2013 CEPP BA and 2018 CEPP BA, the Corps previously determined that CEPP may affect, but is not likely to adversely affect these species. Concurrence on this determination was received with receipt of the 2014 Programmatic BO and in correspondence dated December 21, 2018 from the USFWS; however, based on the current distribution of these species the Corps has determined a no effect determination as these species lie outside of the action area. These species no longer occur in ENP.

6.3.2 "May Affect" Determination

The Corps reaffirms its "May Affect Not Likely to Adversely Affect" determinations from the 2018 CEPP South BA for Federally threatened or endangered species as shown in **TABLE 3**; however changes have occurred that require a revision to the determination for the Bartram's hairstreak butterfly, Florida leafwing butterfly, Everglades bully, Florida pineland crabgrass, Florida prairie clover, pineland sandmat, and Blodgett's silverbush, as discussed below. Effects determinations for the Florida panther, the Florida manatee, Florida bonneted bat, American alligator, American crocodile, Eastern indigo snake, and Garber's spurge remain consistent with the 2018 CEPP South BA; however additional information has been included, as detailed below with respect to planned implementation of components of the 2014 CEPP AMMP as part of the construction contracts for CEPP South. The Corps is requesting formal consultation in this 2020 CEPP South BA for the Everglade snail kite and its designated critical habitat, the endangered CSSS and its designated critical habitat, and the threatened wood stork.

6.3.2.1 Florida Panther and "May Affect Not Likely to Adversely Affect" Determination

The Florida panther was once the most widely distributed mammal (other than humans) in North and South America. One of 30 cougar subspecies, Florida panther is tawny brown on the back and pale gray underneath, with white flecks on the head, neck and shoulder. Male panthers weigh up to 130 pounds

and females reach 70 pounds. Preferred habitat consists of cypress swamps, pine and hardwood hammock forests. The main diet of the Florida panther consists of white-tailed deer, sometimes wild hog, rabbit, raccoon, armadillo and birds. Florida panthers are solitary, territorial, and often travel at night. Males have a home range of up to 400 square miles and females about 50 to 100 square miles. Female panthers reach sexual maturity at about three years of age. Mating season is December through February. Gestation lasts about 90 days and females bear two to six kittens. Juvenile panthers stay with their mother for about two years. Females do not mate again until their young have dispersed. The main survival threats to the Florida panther include habitat loss due to human development and population growth, collision with vehicles, parasites, feline distemper, feline alicivirus (an upper respiratory infection), and other diseases.

Lands have been designated for panther conservation (**FIGURE 12**). These lands include the Panther focus Area located in central and southern Florida. Florida panthers have used, and are likely to continue to use, the action area as portions of home ranges, or for dispersal. Florida panthers presently inhabit lands in ENP adjacent to the Southern Glades, and radio tracking studies have shown that they venture into the Southern Glades on occasion during post-breeding dispersion (**FIGURE 13**). Florida panthers do not use the open water areas of the WCA and ENP on a regular basis. **FIGURE 14** displays Florida panther telemetry data from February of 1981 through June of 2017 obtained from the Florida Fish and Wildlife Conservation Commission (FWC 2018). They may, during periods of low water, hunt on tree islands where prey may be present. They have been documented crossing SRS as well, but primarily use the higher elevations within ENP. Since potentially suitable habitat occurs within the action area, increased water deliveries to WCA 3B and ENP could affect Florida panther habitat. The 2013 CEPP BA (referenced in the 2018 CEPP BA) noted that CEPP has the potential to affect both the Primary and Secondary Zones (**FIGURE 12**) through degradation of levees, backfilling of canals, and degradation of spoil mounds and creation of the Blue Shanty Levee. Reference Section 6.2.5 of the 2013 CEPP BA for additional information. **TABLE 4** shows the CEPP South project features that will affect primary and secondary panther habitat either through degradation of spoil mounds, levees, backfilling of canals, and creation of the Blue Shanty levee. Also included are number of acres lost, acres created and the panther habitat unit value. The 2014 CEPP PIR/EIS and AMMP recommended management options to fill agricultural ditches in the Blue Shanty Flowway to improve southerly flow conveyance to the L-29 Canal and to move water through the Tamiami Trail western bridge. Reference the red circle in **FIGURE 3** for the location of the approximate 4.0 mile east-west agricultural ditch to be backfilled under CEPP South. Approximately 1.56 miles are expected to be backfilled under Contract 1. **TABLE 4** has been updated to include complete backfill of the east-west agricultural ditch and removal of spoil mounds along the northwestern side of the L-67A canal in the proximity of the S-631, S-632, and 6-333 structures referenced in the 2014 PIR/EIS, but not previously included in this table in the 2018 CEPP BA. Spoil mounds (assumed 3 spoil mounds per structure) will be removed to facilitate sheetflow connectivity with the WCA 3A marsh. The removal of 3 spoil mounds at each structure, equates to an approximate footprint of 10 acres. Total acres lost are equivalent to the total acres created for those features that fall under CEPP South; however the total panther habitat value increased from 1,134.1 to 1,796. Reference **TABLE 4.**

TABLE 4. PANTHER HABITAT IMPACTS FOR CEPP SOUTH FEATURES BASED ON PANTHER HABITAT UNIT VALUES* INCLUDING IMPLEMENTATION OF AMMP COMPONENTS

Project Feature	Zone of Impacted Lands	Acres Lost	Panther Habitat Unit Value	Total HUs	Acres Created	Panther Habitat Unit Value	Total HUs
L-67A Spoil Mound Degrade (assumed 3 spoil mounds per S-631, S-632, and S-633) (barren/disturbed to marsh)	Primary	10	3	30	10	4.7	47
L-67C Gap Degrade (barren/disturbed to marsh)	Primary	9	3	27	9	4.7	42.3
L-67C Flowway Degrade (barren/disturbed to marsh)	Primary	64	3	192	64	4.7	300.8
L-29 Degrade (barren/disturbed to marsh)	Primary	46	3	138	46	4.7	216.2
Blue Shanty Levee Creation (marsh/wet) prairie to barren/disturbed)	Primary	113	4.7	531.1	113	3	339
L-67 Extension Levee Degrade (barren/disturbed to marsh)	Primary	41	3	123	41	4.7	192.7
L-67 Extension Backfill (water to marsh)	Primary	104	0	0	104	4.7	488.8
Old Tamiami Trail Road Degrade (barren/disturbed to marsh)	Primary	31	3	93	31	4.7	145.7
East-West Agricultural Ditch Backfill (water to marsh)	Primary	5	0	0	5	4.7	23.5
Total		**423**	**22.7**	**1,134.1**	**423**	**40.6**	**1,796**

*** Reference Table 6-2 of the 2013 CEPP BA for a complete listing of CEPP features proposed within the 2014 CEPP Final PIR/EIS and the associated acres lost (USACE 2013). The above table reflects only those features included in CEPP PPA South and is therefore reflective of the Proposed Action.**

The Proposed Action is expected to benefit WCA 3B and ENP by increasing flows to the area. This increase in hydroperiod is unlikely to significantly affect the higher elevations used by panthers as operations of

the CEPP South features are expected to be subject to current downstream constraints, consistent with ALTQ+ (COP Preferred Plan) which include maintaining required water levels in the residential and agricultural areas in southeastern Miami-Dade County. The L-29 canal stage is anticipated to be limited to below that identified within the 2014 Final CEPP PIR/EIS which assumed a maximum operating limit of 9.7 feet, NGVD. The hydrologic effects of the Proposed Action are expected to benefit existing wetlands within the action area. As lands within the CEPP South action area become restored to their more historic natural values, the improved forage base would result in greater use by the Florida panther utilizing these areas. Panther prey density is an important factor in evaluating panther habitat. The type of prey available to the panther affects the health and distribution of the panther, as well as its ability to breed and support young. Small mammals including raccoons and river otters would benefit from increased crayfish and small prey fish biomass in rehydrated areas within WCA 3B and ENP as a result of CEPP South. Implementation of CEPP South would result in similar effects as discussed within the 2013 CEPP BA and 2018 CEPP BA; however CEPP South would likely show a reduced beneficial effect in WCA 3B and ENP as additional water (*i.e.* 210,000 acre-feet) is not anticipated to be delivered until CEPP New Water and CEPP South features are completed in the future.

Potential changes in hydrology within the action area for CEPP South will be similar to those modeled to support development of ALTQ+ (COP Preferred Plan) as plan formulation efforts for the COP were confined to the existing water budget for inflows to WCA 3A from upstream basins (Lake Okeechobee, Everglades Agricultural Area (EAA), WCA 1, and WCA 2). ALTQ+ increased overland flow, water depths and resulting hydroperiods in portions of ENP, including NESRS and Taylor Slough (USACE 2019). Under COP, the L-29 Canal stage is anticipated to be limited to 8.5 feet, NGVD consistent with the operational guidance defined in Appendix A of the 2020 COP EIS (refer to **Section 4**). Reference Section D.2.4.2 of the 2019 COP BA for a description of expected differences in water depths and hydroperiods under ALTQ+ in WCA 3 and ENP. Further detail is provided in Section D.2.6.2.1 of the 2019 COP BA and is incorporated by reference.

Based on this information, and the fact that Florida panther is a wide-ranging species with the majority of sightings west of the action area, the Corps has determined that CEPP South may affect, but is not likely to adversely affect the Florida panther, consistent with the determination provided in the 2018 CEPP South BA. Concurrence on this determination was received in correspondence dated December 21, 2018 from the USFWS.

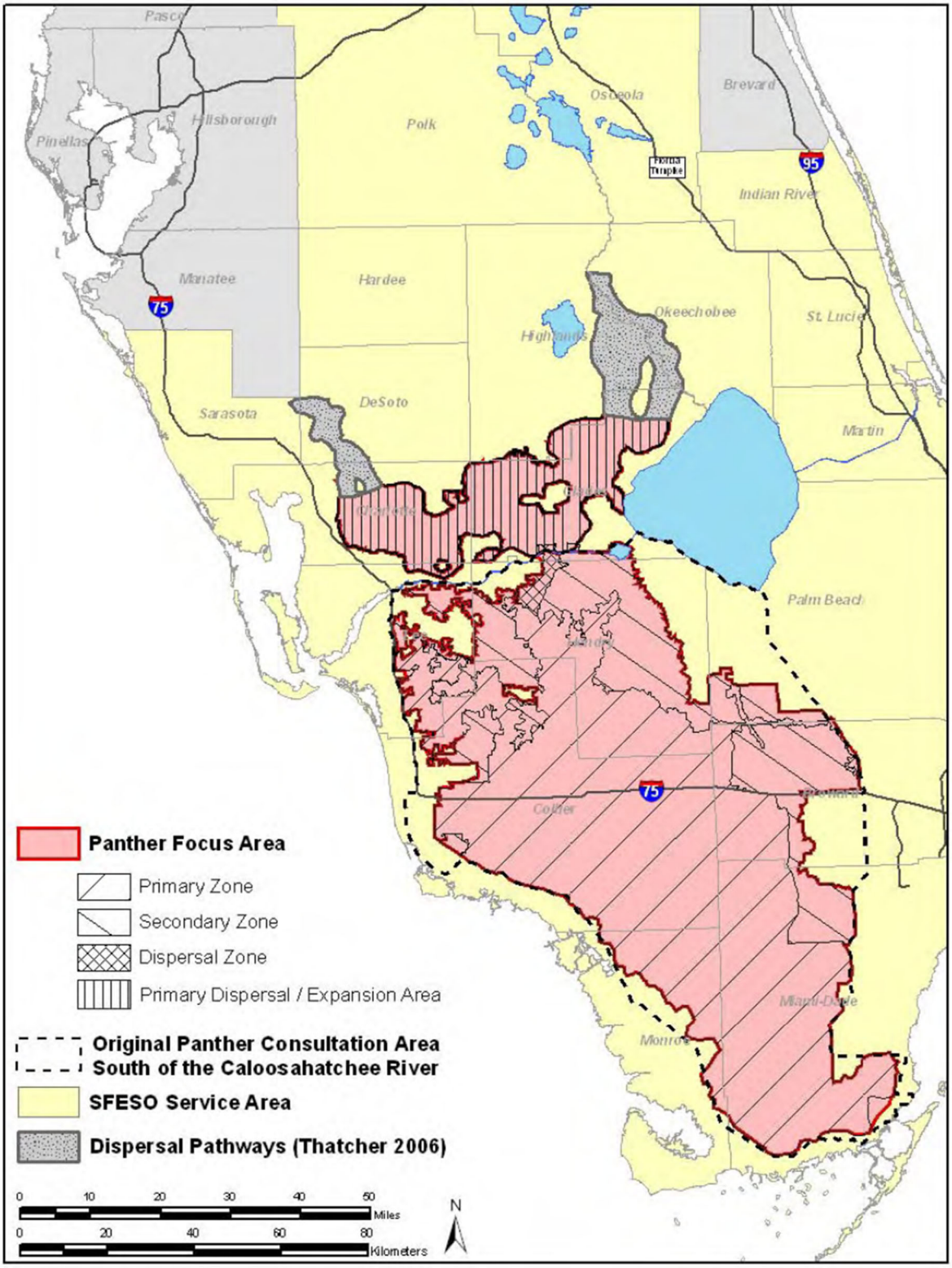


FIGURE 12. FLORIDA PANTHER ZONES IN SOUTH FLORIDA

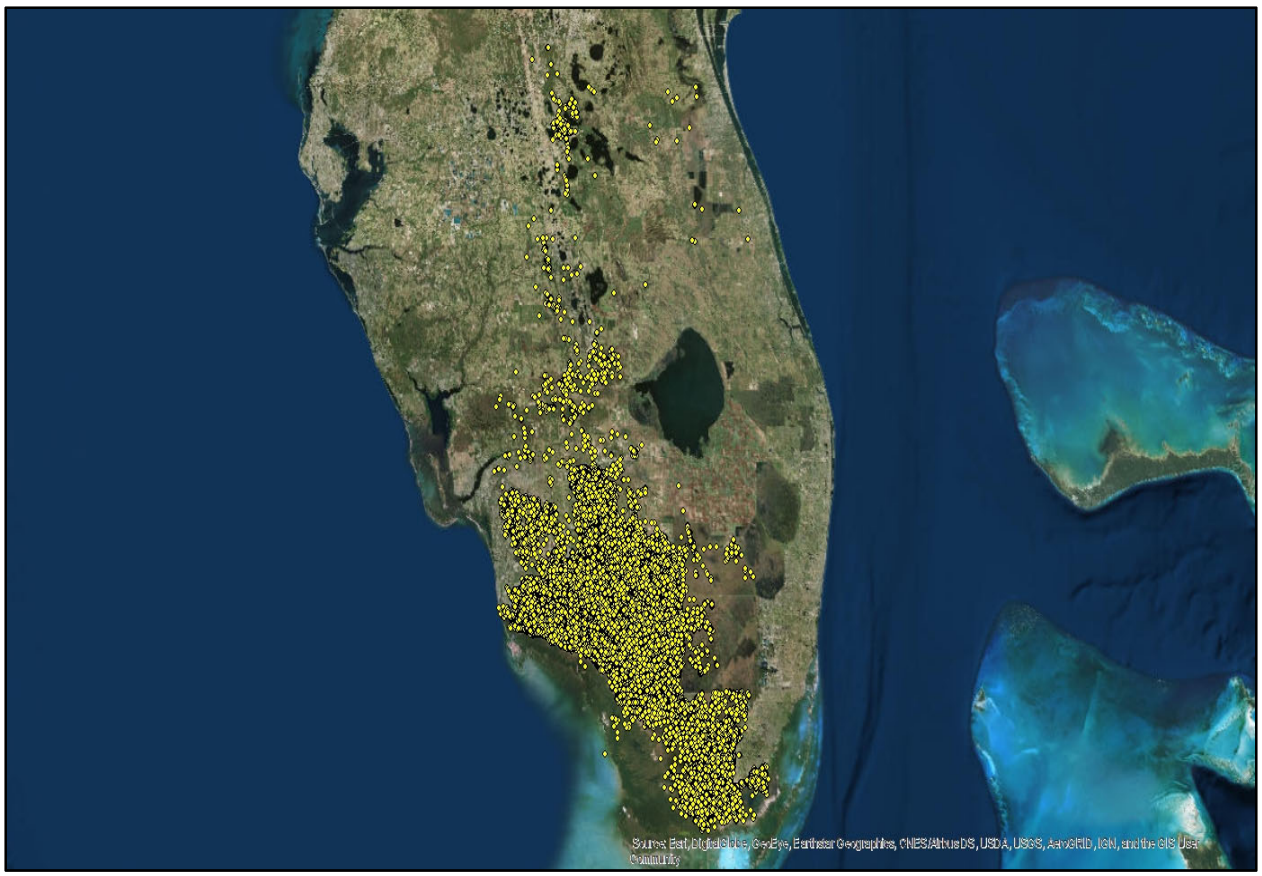


FIGURE 13. FLORIDA PANTHER TELEMETRY INFORMATION (1981-2017)

6.3.2.2 Florida Manatee and Critical Habitat "May Affect Not Likely to Adversely Affect" Determination

The Florida manatee is a large, plant-eating aquatic mammal with a fusiform body that is compressed dorsoventrally and is grey to grey brown in color. Florida manatees live in that can be found in the shallow coastal waters, rivers, and springs of Florida. Florida manatees live in freshwater, brackish, and marine habitats, can move freely between salinity extremes. It can be found in both clear and muddy water. Because they are a subtropical species with little tolerance for cold, they remain near warm water sites in peninsular Florida during the winter. During periods of intense cold, Florida manatees will remain at these sites and will tend to congregate in warm springs and outfall canals associated with electric generation facilities. During warm interludes, Florida manatees move throughout the coastal waters, estuaries, bays, and rivers of both coasts of Florida and are usually found in small groups. During warmer months, Florida manatees may disperse great distances. Florida manatees have been sighted as far north as Massachusetts and as far west as Texas and in all states in between (Rathbun et al. 1982, Fertl et al. 2005). Water depths of at least three to seven feet (one to two meters) are preferred and flats and shallows are avoided unless adjacent to deeper water.

Over the past centuries, the principal sources of Florida manatee mortality have been opportunistic hunting by man and deaths associated with unusually cold winters. As of 2016, the Florida Fish and Wildlife Conservation Commission (FWC) reported 520 Florida manatee deaths that year, which is more than the total number of deaths reported in 2009 (429 deaths), related to the prolonged cold water

conditions in the winter of 2009-2010. Today, poaching is rare, but high mortality rates from human-related sources threaten the future of the species. In general, the largest single mortality factor is collision with boats and barges. Florida manatees also are killed in flood gates and canal locks, by entanglement or ingestion of fishing gear, and through loss of habitat and pollution.

Florida manatees have been observed in conveyance canals throughout the action area, and in adjacent nearshore seagrass beds throughout Florida Bay including all waters of Card, Barnes, Blackwater, Little Blackwater, Manatee and Buttonwood sounds. The extensive acreages of seagrass beds in Florida Bay provides important feeding areas for Florida manatees. Florida manatees also depend upon canals as a source of freshwater and resting sites. It is highly likely that Florida manatees also depend on the deep canals as a cold-weather refuge. The relatively deep waters of the canals respond more slowly to temperature fluctuations at the air/water interface than the shallow bay waters. Thus, the canal waters remain warmer than open bay waters during the passage of winter cold fronts.

The Florida manatee's critical habitat includes all waters of Card, Barnes, Blackwater, Little Blackwater, Manatee and Buttonwood sounds between Key Largo, Monroe County and mainland Miami-Dade County (**FIGURE 6**) Another component of designated critical habitat is defined as Biscayne Bay, and all adjoining and connected lakes, rivers, canals, and waterways from the southern tip of Key Biscayne northward to and including Maule Lake, Dade County. No specific primary or secondary constituent elements were included in the critical habitat designation. However, researchers agree that essential habitat features for Florida manatee include seagrasses for foraging, shallow areas for resting and calving, channels for travel and migration, warm water refuges during cold weather and freshwater for drinking.

The 2013 CEPP BA (and cross references in the 2018 CEPP BA) noted that improvements in seasonal inflow deliveries to Florida Bay and Biscayne Bay has the potential to improve conditions suitable for seagrass survival. Seagrasses within Florida Bay have long suffered from high salinities due to long-term reductions of freshwater flow. Increased freshwater flows to the coastal estuaries would improve salinity, therefore reducing stress on sea grasses that are important to foraging manatees. Reference Section 6.2.4 and of the 2013 CEPP BA for additional information (USACE 2013). Implementation of CEPP South would result in similar effects as discussed within the 2013 CEPP BA and 2018 CEPP BA; however CEPP South would likely show a reduced beneficial effect in the southern estuaries as additional water (*i.e.* 210,000 acre-feet) is not anticipated to be delivered until CEPP New Water and CEPP South features are completed in the future. Furthermore, operations of the CEPP South features are expected to be subject to current downstream constraints, consistent with ALTQ+ (COP Preferred Plan), which include maintaining the required water levels in the residential and agricultural areas in southeastern Miami-Dade County. The L-29 Canal stage is anticipated to be limited to below that identified within the 2014 Final CEPP PIR/EIS which assumed a maximum operating limit of 9.7 feet, NGVD. The Proposed Action is not expected to result in significant adverse impacts to seagrasses within the coastal estuaries.

Potential changes in hydrology within the action area under CEPP South, will be similar to those modeled to support development of ALTQ+ (COP Preferred Plan) as plan formulation efforts for the proposed COP were confined to the existing water budget for inflows to WCA 3A from upstream basins. ALTQ+ increased overland flow, water depths and resulting hydroperiods in portions of ENP, including NESRS and Taylor Slough (USACE 2019). Under COP, the L-29 Canal stage is anticipated to be limited to 8.5 feet, NGVD consistent with the operational guidance defined in Appendix A of the 2020 COP EIS (refer to **Section** 4). Reference Section D.2.6.2.2 of the 2019 COP BA for a description of expected differences in overland flow to Florida Bay and Biscayne Bay and resulting changes in salinity expected under ALTQ+ using the RECOVER salinity performance measure. ALTQ increased flows toward Florida Bay across Transect T23

relative to ECB19RR. This east west transect crosses southern Taylor Slough and the Northern ENP Panhandle, east of the slough. ALTQ increased average annual flows by 36,000 acre feet at this location. Table D.2-5 and Table D.2-6 in Section D.6.2.2 of the 2019 COP BA depicts the mean annual dry season and mean annual wet season salinities for ECB19RR in North Bay, East Bay, East Central Bay, Central Bay, South Bay, and West Bay. Decreases in mean wet salinity were small in all Florida Bay zones. For each zone, decreases in dry season salinity exceeded decreases in wet season salinity. The expected differences may be ecologically significant because they reflect long-term seasonal means and not short-term or even annual extremes (e.g., periods with hypersalinity). Also, the timing of lowered salinity, being more in the dry season, may be ecologically significant because salinity peaks with associated ecological damage are most common in the late dry season and early wet season if precipitation delays occur. Overall the differences in salinity were less than 5%.

The RECOVER salinity performance measure for the southern coastal systems does not currently extend past Florida Bay into Biscayne Bay and was therefore unavailable for an evaluation of this area in the 2019 COP BA. While ALTQ reduced overall flows to Biscayne Bay compared to ECB19RR, the reduction was accounted for entirely by changes to flow in the northern portion of Biscayne Bay which is receiving too much flow during storm events. Concurrently, ALTQ increased freshwater flow to southern Bay, the location of most of Biscayne National Park and CERP's Biscayne Bay Coastal Wetlands Project. This is an area with unnaturally high salinity and increased freshwater flow can yield ecological benefits for this region. Reference Table D.2-8 of the 2019 COP BA for total average annual flow (thousand acre feet) from canals to portions of Biscayne Bay over the modeled period of record (1965-2005) with percentage changes relative to the base condition.

Florida manatees have been observed in conveyance canals within the project area (**FIGURE 14**). Under CEPP South, the entire remaining length of the L-67 Extension Levee (5.5 miles) would be removed and the adjacent borrow canal would be backfilled (5.5 miles). Under CEPP South, three gated culverts (S-631, S-632, and S-633) would be located in the L-67A levee adjacent to the L-67A Canal and a gated spillway (S-355) would be constructed in the L-29 Canal at the southern extent of the proposed L-67D levee to convey water from the L-29 Canal within the Blue Shanty Flowway, eastward towards the existing S-344 spillway. Manatees currently have access to the L-67A Canal and the L-29 Canal. Under CEPP South, approximately 4.0 miles of the east-west agricultural ditch would be backfilled in the Blue Shanty Flowway to improve southerly flow conveyance to the L-29 Canal (**FIGURE 3**). Approximately 1.56 miles are expected to be backfilled under Contract 1 of CEPP South. This shallow agricultural ditch is not hydrologically connected to the L-67A Canal and is inaccessible to manatees. The Corps commits to avoiding and minimizing for adverse effects during construction activities by implementing construction conservation measures as outlined in Standard Manatee Conditions for In-Water Work consistent with the commitment provided in the 2018 CEPP South BA.

Improvements in seasonal inflow deliveries to Florida Bay and southern Biscayne Bay has the potential to improve conditions suitable for seagrass survival. Seagrasses within Florida Bay and southern Biscayne Bay have long suffered from high salinities due to long-term reductions of freshwater flow. Increased freshwater flows to the coastal estuaries would improve salinity, therefore having the potential to reduce stress on sea grasses that are important to foraging manatees. Based on the above information, the Corps has determined that CEPP South may affect, but is not likely to adversely affect the Florida manatee and its designated critical habitat. In the 2013 CEPP BA and 2018 CEPP BA, the Corps previously determined that CEPP may affect, but is not likely to adversely affect the Florida manatee and its designated critical habitat. Concurrence on this determination was previously received with receipt of the 2014 Programmatic BO and in correspondence dated December 21, 2018 from the USFWS.

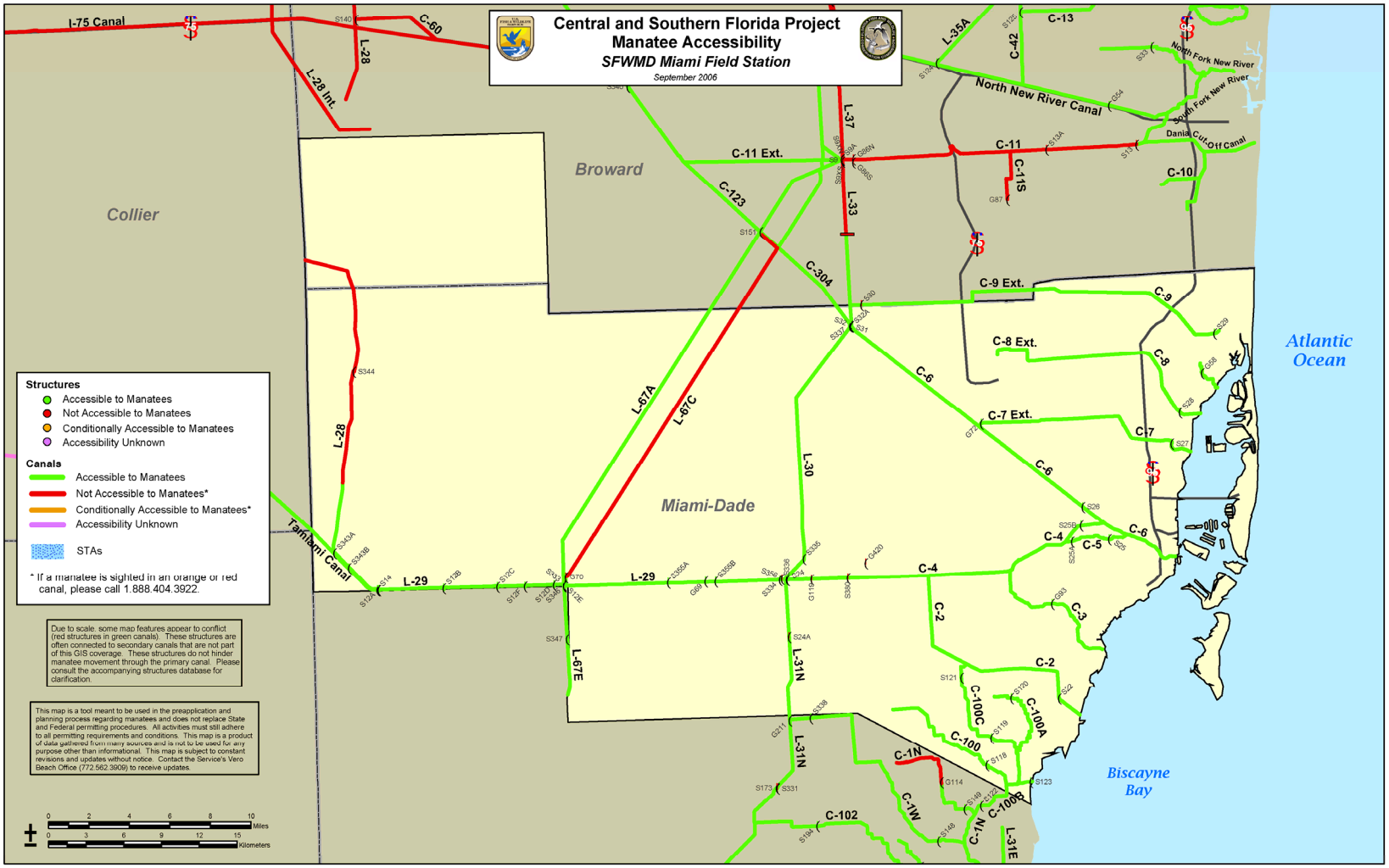


FIGURE 14. WEST INDIAN MANATEE CENTRAL AND SOUTH FLORIDA ACCESSIBILITY

6.3.2.3 Florida Bonneted Bat and "May Affect Not Likely to Adversely Affect" Determination

The Florida bonneted bat is Florida's only endemic bat and is also Florida's largest bat, weighing approximately 1.1 to 1.6 ounces, with a 19 to 21 inch wingspan, and a body length of 5.1 to 6.5 inches Owre 1978, Belwood 1981, Belwood 1992, Timm and Genoways 2004). Males and females are not significantly different in size (Timm and Genoways 2004). The species has dark brown fur and large broad ears that join together and slant forward over the eyes (FBC 2005). Relatively little is known regarding the ecology and habitat requirements of this species. In general, bats will forage over ponds, streams and wetlands and require roosting habitat for daytime roosting, protection from predators and rearing of young (Marks and Marks 2008a). Bats in south Florida roost primarily in trees and manmade structures (Marks and Marks 2008a). Florida bonneted bats roost in tree cavities, rocky outcrops and dead palm fronds while in residential communities, the bats roost in Spanish tile roofs, but have also been found in attics, rock or brick chimneys and fireplaces of old buildings (Marks and Marks 2008a). The species roosts singly or in colonies consisting of a male and several females (Belwood 1992). Colonies are small, with the largest reported as just a few dozen individuals. The Florida bonneted bat is non-migratory. The species is active year round and does not have periods of hibernation or torpor (Timm and Genoways 2004). The bat is a nocturnal insectivore and relies upon echolocation to navigate and detect prey. Females give birth to a single pup. The maternity season for most bat species in Florida occurs from mid-April through mid-August (Marks and Marks 2008a). During the early portion of the season, females give birth and leave young in the roost while foraging to support lactation. During the latter part of this season, young and females forage together until the young are able to forage and survive on their own (Marks and Marks 2008a). Limited data suggests that a female may undergo a second birthing season within a given year (Timm and Genoways 2004, FBC 2005).

Florida bonneted bats are capable of dispersing long distances from roost sites to foraging areas. In general, open, fresh water and wetlands provide prime foraging areas for bats (Marks and Marks 2008b). Bats will forage over ponds, streams and wetlands, and will drink when flying over open water. During dry seasons, bats become more dependent on remaining ponds, streams, and wetland areas for foraging purposes (Marks and Marks 2008b). Florida bonneted bats are closely associated with forested areas because of their tree-roosting habits (Robson 1989; Belwood 1992; Eger 1999), but specific information is limited. Eger (1999) noted that in forested areas, old, mature trees are essential roosting sites for this species. Protective tree cover around bat roosts may be important for predator avoidance and allowing earlier emergence from the roost, thereby allowing bats to take advantage of the peak in insect activity at dusk and extend foraging time (Duverge et al. 2000). The presence of roosting habitat is also critical for the rearing of young (Marks and Marks 2008b). For most bats, the availability of suitable roosts is an important, limiting factor (Humphrey 1975).

At present, only three active, natural roost sites are known, and only limited information on historical sites is available. Echolocation calls have been recorded in a wide array of habitat types: pine flatwoods, pine rocklands, cypress, hardwood hammocks, scrubby flatwoods, mixed shrubs, mangroves, wetlands, swamps, rivers, lakes, ponds, canals, developed park lands, groves, tropical gardens, disturbed nonnative areas, rural lands, residential areas, and urban landscapes (Marks and Marks 2008a–c; 2012; Smith 2010). The range of this species is limited to southern Florida. Records indicate that it was once common in the 1950s and early 1960s near Coral Gables and Miami (Belwood 1992). Active roost sites occur at Avon Park Air Force Range discovered in 2013, the Florida Panther National Wildlife Refuge (FPNWR) discovered in 2015 and in BCNP discovered in 2015 (USFWS 2016b).

Habitat loss and alteration in forested and urban areas are major threats to the Florida bonneted bat (Belwood 1992, Timm and Arroyo-Cabrales 2008). In natural areas, this species may be impacted when forests are converted to other uses or when old trees with cavities are removed (Belwood 1992, Timm and Arroyo-Cabrales 2008). In urban settings, this species may be impacted when buildings with suitable roosts are demolished (Robson 1989, Timm and Arroyo-Cabrales 2008) or when structures are modified to exclude bats. Although the species' habitat preferences and extent of range are not well understood, significant land use changes have occurred in south Florida and additional habitat losses are expected in the future, placing the species at risk. Uncertainty regarding the species' specific habitat needs and requirements arguably contributes to the degree of this threat. Loss of suitable habitat is believed to be the primary cause of population decline. Other perceived threats include pesticide and herbicide use, which decrease populations of insects, the bats primary prey. Since the Florida bonneted bat is suspected to have high roost site fidelity, the loss of a roost site may cause greater hardship to the species than the loss of a roost site for other, more labile species (Ober 2012).

The USFWS has defined consultation areas for the Florida bonneted bat in south Florida (**FIGURE 15**). The Florida bonneted bat is restricted to south, southwest, and south-central Florida. The main action area falls within the defined consultation area.

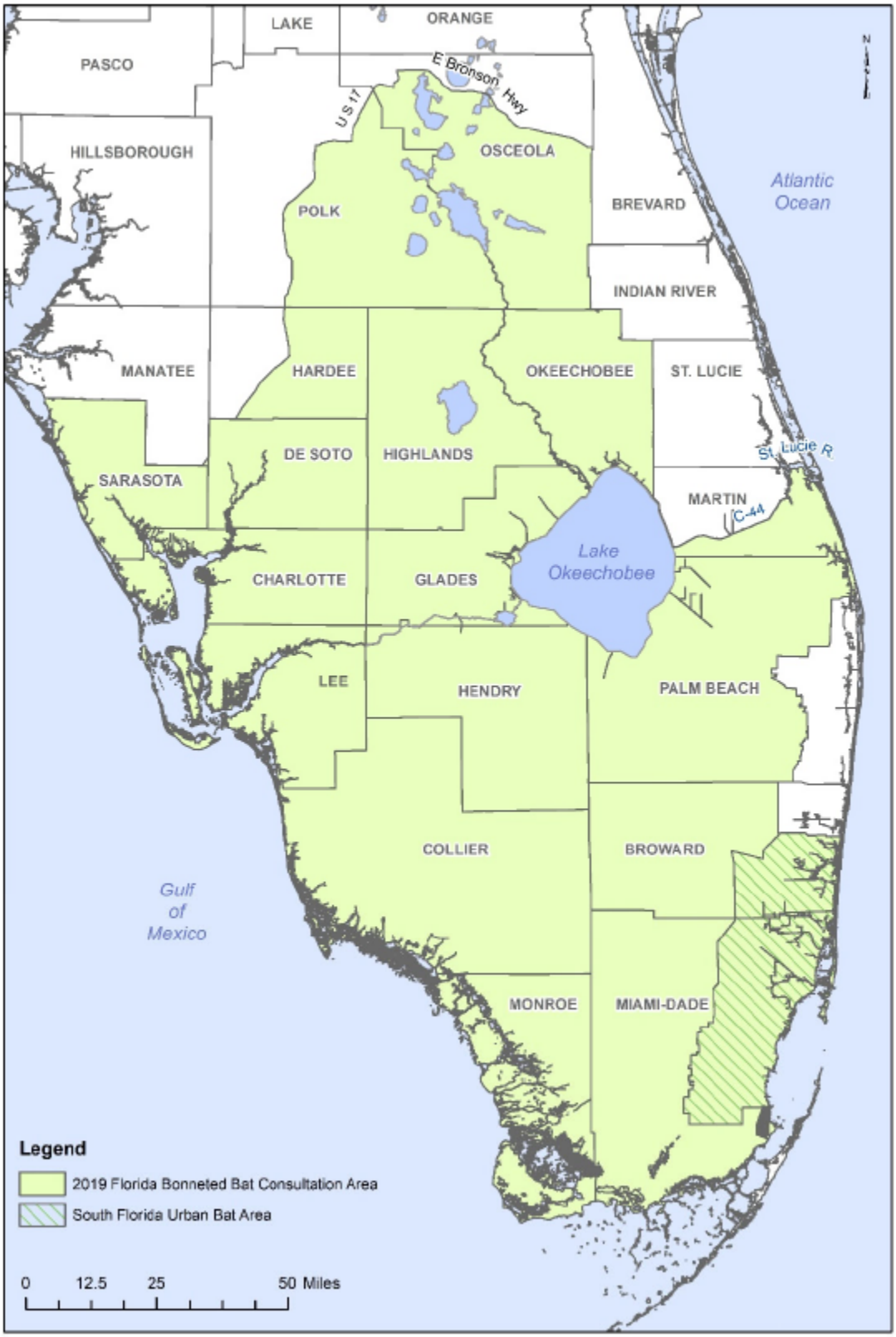


FIGURE 15. FLORIDA BONNETED BAT CONSULTATION AREA

Any actions that occur in areas known to be occupied by the Florida bonneted bat and result in the removal of potential roost sites (i.e., snags, trees) or impact foraging habitat (i.e., filling in of canals and ditches) are likely to have direct and indirect adverse effects to the Florida bonneted bat and its habitat. Known locations of Florida bonneted bats have been documented through the presence of acoustical surveys and/or sightings within south Florida. The potential presence of Florida bonneted bats have been documented within the action area as illustrated in **FIGURE 3**. **FIGURE 3** was provided by the USFWS and notes the potential presence of Florida bonneted bats along portions of the L-67A and L-67C canals and levees, as well as adjacent to NESRS along the L-31N canal and levee. At present, no active, natural roost sites are known to occur within the action area. Impacts to potential roost sites are not anticipated under the Proposed Action.

Florida bonneted bat is known to forage along wetlands and open water (Marks and Marks 2008a) and roost within pine flatwoods and other forested habitats (Belwood 1981, Robson 1989, Belwood 1992, Eger 1999). This species forages for insects at night while flying over water. Under CEPP South, the entire remaining length of the L-67 Extension Levee (5.5 miles) would be removed and the adjacent borrow canal would be backfilled (5.5 miles), resulting in a potential loss of foraging habitat through filling in of the canal. In addition, approximately 4.0 miles of the east-west agricultural ditch would also be backfilled in the Blue Shanty Flowway to improve southerly flow conveyance to the L-29 Canal (**FIGURE 3**). Approximately 1.56 miles are expected to be backfilled under Contract 1 of CEPP South. However, this potential impact may be offset by an improvement in forage conditions by increasing the quality of existing wetlands. Potential changes in hydrology within the action area under CEPP South, will be similar to those modeled to support development of ALTQ+ (COP Preferred Plan) as plan formulation efforts for the COP were confined to the existing water budget for inflows to WCA 3A from upstream basins. Under COP, the L-29 Canal stage is anticipated to be limited to 8.5 feet, NGVD consistent with the operational guidance defined in Appendix A of the 2020 COP EIS (refer to **Section** 4). ALTQ+ increased overland flow, water depths and resulting hydroperiods in portions of ENP, including NESRS and Taylor Slough (USACE 2019). Reference Section D.2.4.2 of the 2019 COP BA for a description of expected differences in water depths and hydroperiods under ALTQ+ in WCA 3 and ENP.

Under CEPP South, approximately 1,003 acres would be managed to enhance flow by reconnecting historic sloughs. This would be accomplished with active vegetation management through use of herbicides (glyphosate) to remove sawgrass that has encroached historic sloughs. As mentioned above, perceived threats to the Florida bonneted bat include pesticide and herbicide use, which decrease populations of insects, the bats primary prey. Only a one time application of glyphosate is expected to occur, therefore potential effects to insect populations may be minimal. Application of the herbicide is expected to reduce the sawgrass, creating a more open canopy to allow for periphyton growth. The treated area is expected to become more of a functioning slough in terms of movement of water across the landscape.

Based on the above information, the Corps has determined that the action may affect, but is not likely to adversely affect, this species. The Florida bonneted bat may occur in the action area. The Corps proposes specific minimization measures as part of the project such as pre-construction surveys to be conducted prior to clearing and construction in order to identify any potential roost sites consistent with the commitment provided in the 2018 CEPP South BA. If an active roost site is located by site surveys, habitat protection in the form of avoidance and buffering of the active roost site will occur in that area. If the recommended Florida bonneted bat surveys are conducted and locate an active roost, then the Corps will: (1) protect and buffer the active roost site; (2) develop a monitoring plan for the roost site following completion of construction to determine the status of the roost site; and/or (3) mitigate for the loss of

roost habitat if deemed necessary by constructing artificial roosting structures in the roost site area after construction.

In the 2013 CEPP BA, the Corps made a no effect determination. USFWS concurrence on this determination was received previously with receipt of the 2014 Programmatic BO. The Corps has identified a may affect, not likely to adversely affect determination given the potential presence of Florida bonneted bats within the action area that have been identified since completion of ESA consultation in 2014, consistent with the determination provided in the 2018 CEPP South BA. Concurrence on this determination was received in correspondence dated December 21, 2018 from the USFWS.

6.3.2.4 Cape Sable Seaside Sparrow and "May Affect" Determination

Measuring 13-14 centimeters in length, CSSS is one of nine subspecies of seaside sparrows (Werner 1975). CSSS are non-migratory residents of freshwater to brackish marshes and their range is restricted to the lower Florida peninsula. They were originally listed as endangered in 1969 due to their restricted range (USFWS 1999). Subsequent changes in their habitat have further reduced their range and continue to threaten this subspecies with extinction.

CSSS appear to prefer mixed marl prairie communities that include muhly grass (*Muhlenbergia filipes*) for nesting (Stevenson and Anderson 1994). These short-hydroperiod (the period of time during which a wetland is covered by water) prairies contain a mosaic of moderately dense, clumped grasses, interspersed with open space that permit ground movements by the sparrows (USFWS 1999). According to previous literature, (Werner 1975; Bass and Kushlan 1982), CSSS are generally not found in communities dominated by dense sawgrass, cattail (*Typha spp*.) monocultures, long hydroperiod wetlands with tall, dense vegetative cover, spikerush marshes, and sites supporting woody vegetation. However, recent research has revealed that CSSS within the Dogleg North plot sub-population B (CSSS-B) were successfully nesting in "very thick, tall sawgrass" (Virzi and Davis 2013; Slater et al. 2014). Curnett and Pimm (1993) indicated that CSSS also avoid sites with permanent water cover; however, more recent evidence has shown that CSSS successfully nested in areas in which "water levels were extremely high approaching knee-deep at times with 100% coverage the entire summer" (Virzi and Davis 2013). The combination of hydroperiod and periodic fire events are critical in the maintenance of suitable mixed marl prairie communities for the CSSS (Kushlan and Bass 1983).

CSSS nest in the spring when the marl prairies are dry. While the majority of nesting activities have been observed between March 1 and July 15 when Everglades marl prairies are dry, (Lockwood et al. 1997, 2001), nesting has been reported as early as late February (Werner 1975), and as late as early August (Dean and Morrison 2001). Males will establish breeding territories in early February (Balent et al. 1998) and defend these territories throughout the breeding season (USFWS 1999). Male sparrows vocalize to attract females and this particular breeding activity has been shown to decrease with increased surface water conditions (Nott et al. 1998; Curnutt and Pimm 1993).

CSSS construct their nests relatively close to the ground in clumps of grasses composed primarily of muhly, beakrushes (*Rhynchospora spp.),* and Florida little bluestem (*Schizachyrium rhizomatum*) (Pimm et al. 2002). The average early season nest height is 17 centimeters (6.7 inches) above ground, while the average late season nest height is 21 centimeters (8.3 inches) above ground (Lockwood et al. 2001). The shift in average nest height after the onset of the wet season rainfall pattern, which typically begins in early June (Lockwood et al. 2001), appears to be an adaptive response to rising surface water conditions. In general, the CSSS will raise one or two broods within a season; however, if weather conditions permit,

a third brood is possible (Kushlan et al. 1982; USFWS 1983). A new nest is constructed for each successive brood. The end of the breeding season is triggered by the onset of the rainy season when ground water levels rise above the height of the nest off the ground (Lockwood et al. 1997).

CSSS will lay three to four eggs per clutch (Werner 1975; Pimm et al. 2002) with a hatching rate ranging between 0.66 and 1.00 (Boulton et al. 2009b). The nest cycle lasts between 34 and 44 days in length and includes a 12-13 day incubation period, 9-11 day nestling period and 10-20 days of post-fledgling care by both parents (Sprunt 1968; Trost 1968; Woolfenden 1956, 1968; Lockwood et al. 1997; Pimm et al. 2002). Nest success rate varies between 21 and 60 percent, depending upon timing of nest initiation within the breeding season (Baiser et al. 2008; Boulton et al. 2009a). Substantially higher nest success rates occur within the early portion of the breeding season (approximately 60% prior to June 1) followed by a decline in success as the breeding season progresses to a low of approximately 21% after June 1 (Baiser et al. 2008; Boulton et al. 2009a; Virzi et al. 2009). In most years, June 1 is a good division between the early high success period and the later, lower success period (Dr. Julie Lockwood email correspondence to USFWS, October 15, 2009). Nearly all nests that fail appear to fail due to predation, and predation rates appear to increase as water level increases (Lockwood et al. 1997, 2001; Baiser et al. 2008). A complete array of nest predators has not been determined. However, raccoons (*Procyon lotor*), rice rats (*Oryzomys palustris*), and snakes, including exotic pythons, may be the chief predators (Lockwood et al. 1997; Dean and Morrison 1998; Post 2007).

A dietary generalist, CSSS feed by gleaning food items from low-lying vegetation (Ehrlich et al. 1992; Pimm et al. 2002). Common components of their diet include soft-bodied insects such as grasshoppers, spiders, moths, caterpillars, beetles, dragonflies, wasps, marine worms, shrimp, grass, and sedge seeds (Stevenson and Anderson 1994). The importance of individual food items appears to shift in response to their availability (Pimm et al. 2002).

CSSS are non-migratory with males displaying high site fidelity, defending the same territory for two to three years (Werner 1975). CSSS are capable of both short-distance and longer-range movements, but appear to be restricted to short hydroperiod prairie habitat (Dean and Morrison 1998). Large expanses of deep water or wooded habitat act as barriers to long-range movements (Dean and Morrison 1998). Recent research by Julie Lockwood, Ph.D. of Rutgers University and her students have revealed substantial movements between subpopulations east of Shark River Slough (Lockwood et al. 2008; Virzi et al. 2009), suggesting that CSSS has considerable capacity to colonize unoccupied suitable habitat (Sustainable Ecosystems Institute 2007).

Presently, the known distribution of CSSS is restricted to two areas of marl prairies east and west of Shark River Slough in the Everglades region (within ENP and BCNP) and the edge of Taylor Slough in the Southern Glades Wildlife and Environmental Area in Miami-Dade County. CSSS presently inhabit six separate subpopulations, labeled as A through F (**FIGURE 16**), with subpopulation A (CSSS-A) as the only subpopulation west of Shark River Slough. The CSSS-A expansion area (i.e. CSSS-Ax) is illustrated adjacent to CSSS-A and is highlighted in green. Monitoring conducted in recent years have identified this area, as a location where birds current reside and/or are thought to be able to expand to. CSSS-A is now referred to as CSSS-Ax. CSSS-B, CSSS-C, CSSS-D, CSSS-E, and CSSS-F are designated as critical habitat units U1-U5, respectively

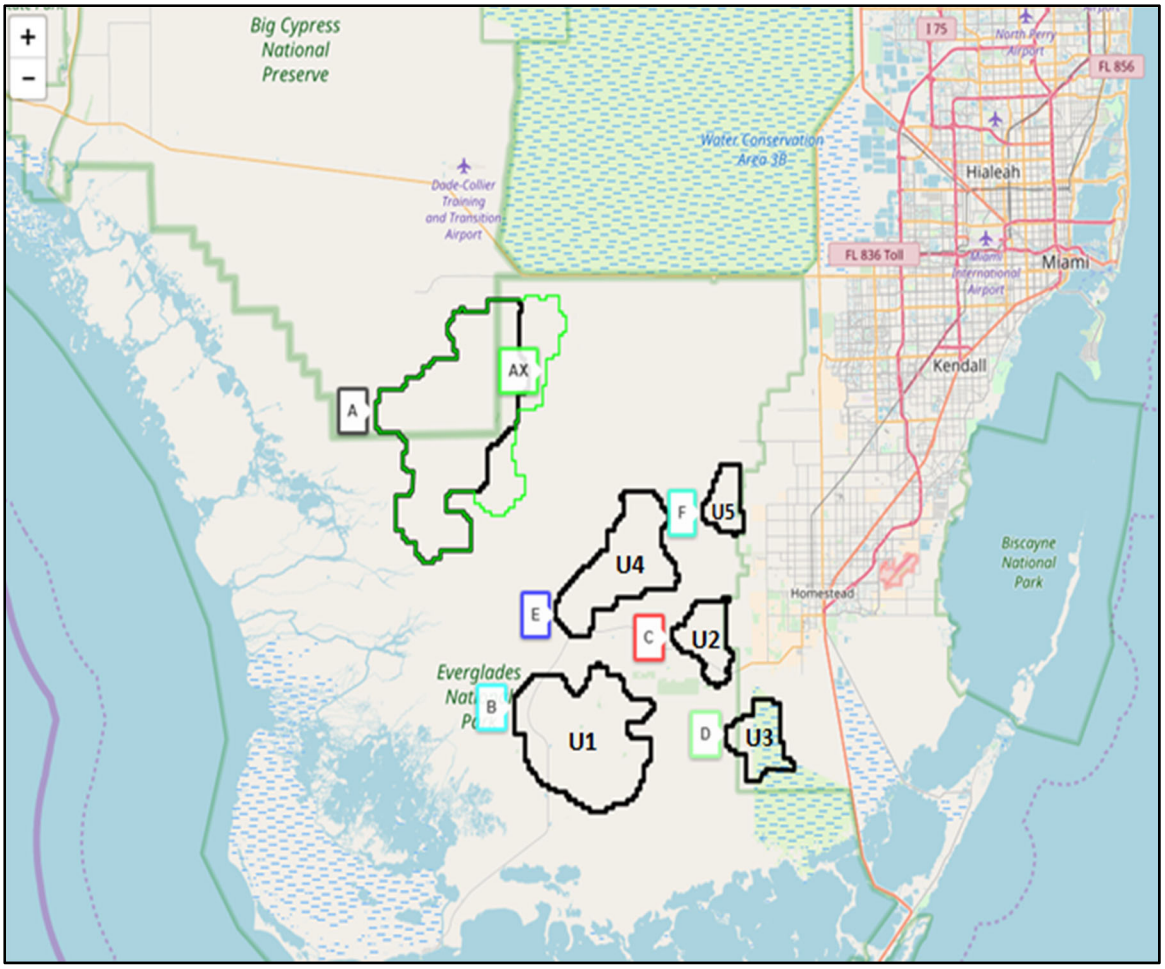


FIGURE 16. CAPE SABLE SEASIDE SPARROW SUBPOPULATIONS (A-F) AND DESIGNATED CRITICAL HABITAT UNITS (U1-U5). CSSS-AX IS ILLUSTRATED ADJACENT TO CSSS-A HIGHLIGHTED IN GREEN.

TABLE 5. CAPE SABLE SEASIDE SPARROW BIRD COUNT AND POPULATION ESTIMATES BY YEAR AS RECORDED BY THE EVERGLADES NATIONAL PARK RANGE-WIDE SURVEY (Data Source USFWS September 18, 2019 Leadership Group Meeting)

Population/ Year	CSSS-A		CSSS-B		CSSS-C		CSSS-D		CSSS-E		CSSS-F		Total	
	BC	EST	BC	EST	BC	EST	BC	EST	BC	EST	BC	EST	BC	EST
2001	8	128	133	2,128	6	96	2	32	53	848	2	32	204	3,264
2002	6	96	119	1,904	7	112	0	0	36	576	1	16	169	2,704
2003	8	128	148	2,368	6	96	0	0	37	592	2	32	201	3,216
2004	1	16	174	2,784	8	128	0	0	40	640	1	16	224	3,584
2005	5	80	142	2,272	5	80	3	48	36	576	2	32	193	3,088
2006	7	112	130	2,080	10	160	0	0	44	704	2	32	193	3,088
2007	4	64	157	2,512	3	48	0	0	35	560	0	0	199	3,184
2008	7	112	NS	NS	3	48	1	16	23	368	0	0	34	544*
2009	6	96	NS	NS	3	48	2	32	27	432	0	0	38	608*
2010	8	128	119	1904	2	32	4	64	57	912	1	16	191	3,056
2011	11	176	NS	NS	11	176	1	16	37	592	2	32	62	992^
2012	21	336	NS	NS	6	96	14	224	46	736	4	64	91	1,456^
2013	18	288	112	1792	8	128	1	16	45	720	1	16	185	2,960
2014	4	64	114	1864	7	112	2	32	42	672	1	16	170	2720

Population/ Year	CSSS-A		CSSS-B		CSSS-C		CSSS-D		CSSS-E		CSSS-F		Total	
2015	13	208	120	1920	7	112	4	64	55	880	2	32	201	3216
2016	3	48	112	1792	7	112	5	80	24	384	0	0	151	2416
2017+	1	16	121	1936	3	48	4	84	75	1200	1	16	205	3280
2018	2	32	120	1920	9	144	16	256	50	800	2	32	199	3184
2019	0	0	96	1536	5	80	11	176	55	880	1	16	168	2688

BC: Bird Count EST: Estimate NS: Not Surveyed

* These numbers do not reflect a significant decline in CSSS population. CSSS-B, the largest and most stable subpopulation, was not surveyed in 2008 or 2009. Adding the 2007 CSSS-B population estimate of 2,512 birds to those of the other subpopulations, the estimated total CSSS population size is 3,056 and 3,120 birds for 2008 and 2009, respectively.

^ These numbers do not reflect a significant decline in CSSS population. CSSS-B, the largest and most stable subpopulation, was not surveyed in 2011 or 2012. Adding the 2010 CSSS-B population estimate of 1,904 birds to those of the other subpopulations, the estimated total CSSS population size is 2,896 and 3,360 birds for 2011 and 2012, respectively.

+ Note: CSSS-A includes limited survey sites in CSSS-Ax.

6.3.2.4.1 Potential Affects to the CSSS

Evaluation of potential effects to the CSSS within the 2013 CEPP BA (and referenced in the 2018 COP BA) included adaptations of ERTP PMs, and a habitat suitability index (HSI) for marl prairie habitat to predict potential effects of implementation of the CEPP Recommended Plan as compared to the ECB and FWO. CSSS are largely sedentary, occupy the prairie habitats year-round and are completely dependent on the condition of the prairies. Favorable nesting habitat requires short hydroperiod vegetation characteristic of mixed marl prairie communities. The CSSS marl prairie ecological planning tool predicts hydrologic suitability of marl prairies based on CSSS survey presence data and threshold ranges (Pearlstine et al. 2011). The HSI measures marl prairie habitat suitability annually for four metrics: (1) average wet season water depths from June – October, (2) average dry season water depths from November–May, (3) discontinuous annual hydroperiods from May-April of the next year, and (4) maximum continuous dry days during the nesting season from March 1-July 15. Reference Figure 6-53 and Figure 6-54. Suitability for marl prairie habitat under the CEPP Recommended Plan was predicted to decrease in the vicinity of CSSS-B, CSSS-D, CSSS-E, and CSSS-F relative to the ECB and FWO. Marl prairie habitat suitability decreased in CSSS-E compared with the ECB and FWO by 10% and 11%, respectively. Notable changes were predicted to occur within the eastern marl prairies in the vicinity of CSSS-E, along the eastern edge of SRS. Increased hydroperiods within the eastern marl prairies predicted under the CEPP Recommended Plan may potentially result in a shift in vegetation when the entirety of CEPP is implemented. Ross and Sah (2004) noted differences in species composition within wet prairies based upon hydroperiod. Shorter hydroperiod prairies were dominated by *Muhlenbergia*, *Schizachyrium* and *Paspalum*, while longer hydroperiod prairies consisted of *Cladium*, *Schoenus*, and Rhynchospora. Compared to the ECB and FWO, differences in marl prairie habitat suitability within CSSS-B, CSSS-D, and CSSS-F were decreased to a lesser extent as compared to CSSS-E under the CEPP Recommended Plan. Marl prairie habitat suitability decreased in CSSS-B, CSSS-D, and CSSS-F compared with the ECB by 1%, 6%, and 4% respectively. Decreases of 2%, 5%, and 1% were observed for CSSS-B, CSSS-D, and CSSS-F compared with the FWO. Potential shifts in vegetation were predicted to occur to a lesser degree in these subpopulations with implementation of the CEPP Recommended Plan. Analyses of marl prairie habitat suitability with the northwestern marl prairies in the vicinity of CSSS-A revealed negligible benefits as compared with the ECB and FWO. Habitat suitability within central and southern CSSS-A (and flanking regions to the east) declined while habitat suitability in northern CSSS-A and regions northeast of CSSS-A slightly improved. Implementation of the CEPP Recommended Plan was predicted to provide benefits within CSSS-C compared to the ECB and FWO. Marl prairie habitat suitability was improved in CSSS-C compared with the ECB and FWO by 11% and 1%, respectively. Benefits were predicted to be distributed spatially throughout CSSS-C. Reference Section 6.2.8 of the 2013 CEPP BA for additional information related to the marl prairie HSI as well as other ERTP PMs (USACE 2013).

Implementation of CEPP South would result in similar effects as discussed within the 2013 CEPP BA; however CEPP South would likely show a reduced effect to marl prairie vegetation as discussed in the 2013 CEPP BA (and referenced in the 2018 BA) in the eastern CSSS subpopulations as additional water (i.e. 210,000 acre-feet) is not anticipated to be delivered until CEPP New Water and CEPP South features are completed in the future. Furthermore, operations of the CEPP South features will be subject to current downstream constraints consistent with ALTQ+ (COP Preferred Plan), which include maintaining the maximum operating limit in the L-29 Canal at or below a specified stage and maintaining required water levels in the residential and agricultural areas in southeastern Miami-Dade County. The L-29 Canal stage is anticipated to be limited to below that identified within the 2014 Final CEPP PIR/EIS which assumed a maximum operating limit of 9.7 feet, NGVD. Average annual overland flow to NESRS across RSM-GL

Transect 18 (southward flows in northern ENP south of Tamiami Trail and east of the L-67 Extension) within the 2014 CEPP PIR/EIS were predicted to significantly increase to 754,000 acre feet under the CEPP Recommended Plan compared to the FWO (75,000 acre feet average annual). Under the proposed COP, average annual overland flow was observed to increase across RSM-GL Transect 18 by 229,000 acre feet. Reference Table D.2-22 of the 2019 COP BA.

Potential changes in hydrology (and effects on the CSSS) within the action area under CEPP South, will be similar to those modeled to support development of ALTQ+ (COP Preferred Plan) as plan formulation efforts for the COP were confined to the existing water budget for inflows to WCA 3A from upstream basins. Under COP, the L-29 Canal stage is anticipated to be limited to 8.5 feet, NGVD consistent with the operational guidance defined in Appendix A of the 2020 COP EIS (refer to **Section 4** (**CEPP South Project Description**)). Reference Section D.2.3.2 of the 2019 COP BA for a description of expected differences in water depths and hydroperiods under ALTQ+ in WCA 3 and ENP. Further detail is provided in Section D.2.6.2.4 of the 2019 COP BA for potential effects to the CSSS and is incorporated by reference.

For the proposed COP, the CSSS Marl Prairie ecological planning tool was also utilized to evaluate the potential effects of ALTQ on marl prairie habitat in relation to the CSSS. Figure D.2-57 in the 2019 COP BA shows the results of the ecological planning tool overlaid with CSSS critical habitat for ALTQ relative to ECB19RR over the period of record (1965-2005). ALTQ was observed to increase flow to NESRS and the eastern marl prairies relative to ECB19RR (Table D.2-22); however, changes to the eastern marl prairies generally fell within a range of +/- 10% in those subpopulations currently inhabited by CSSS-B through CSSS-F. Marl prairie habitat suitability increased in the northern portion of CSSS-Ax under ALTQ. Areas of decreased suitability were observed in portions of CSSS-E and CSSS-D; however, these observed decreases were coupled with observed increases in suitability in areas directly east of CSSS-E and north and south of CSSS-F and CSSS-C.

The two most critical performance metrics for maintaining and enhancing the chances for CSSS survival are the number of consecutive days during the CSSS nesting season (March 1 – July 15) when there is no surface water (i.e. dry nesting days) and the total number of days when there is water above ground surface during the year (i.e. annual discontinuous hydroperiod) (USFWS 2016). Since it takes the CSSS, a ground nesting bird (nests on average are 17 cm above ground), approximately 45 days to nest and fledge young, the 2016 ERTP BO RPA has set a target of providing at least 90 consecutive dry nesting days between March 1 and July 15, over at least 24,000 acres (equates to 40%) within and adjacent to CSSS-Ax, and across at least 40% of each of the eastern subpopulations (B-F) every year, to allow for multiple broods during each nesting season in order to stabilize and potentially increase the population. Since, an average annual discontinuous hydroperiod of between 90 and 210 days, which normally occurs outside of the nesting season, is required to maintain suitable marl prairie habitat for the CSSS (USFWS 2016), the 2016 ERTP BO has set a target of providing a four year running average discontinuous hydroperiod of 90-210 days over at least 24,000 acres (equates to 40%) within and adjacent to CSSS-Ax (with no 2 consecutive years failing to meet this target), and across at least 40% of each of the eastern subpopulations (B-F). If the number of days with surface water is consistently more than 210 days, the habitat will convert to sawgrass. If it is consistently too dry (less than 90 days) woody vegetation encroaches on the habitat and there is an increased risk of fire and predation on CSSS from aerial predators (raptors).

Table D.2-9 through Table D.2-14 in the 2019 COP BA depicts the percentage of habitat within each of the six CSSS subpopulations (CSSS-Ax, CSSS-B, CSSS-C, CSSS-D, CSSS-E, and CSSS-F) that experienced > 90 consecutive dry days during the nesting season (defined as March 1 through July 15) for each year in the period of record (1965-2005). An average percentage of greater than 40% was achieved over the period

of record in CSSS-Ax and in the eastern subpopulations (CSSS-B, CSSS-C, CSSS-D, CSSS-E, and CSSS-F) under ECB19RR and ALTQ. Across the sub-populations, the difference in average percentage over the period of record for ALTQ relative to ECB19RR, ranged from a minimum difference of -7.7% (CSSS-E) to a maximum difference of 3.4% (CSSS-C). Generally, ALTQ was observed to score equal to or slightly less than ECB19RR.

Figure D.2-15 through Figure D.2-20 in the 2019 COP BA depicts the percentage of habitat within each of the six CSSS subpopulations (CSSS-Ax, CSSS-B, CSSS-C, CSSS-D, CSSS-E, and CSSS-F) that experienced a four year running average discontinuous hydroperiod between 90 and 210 days for each year in the period of record (1965-2005). An average percentage of greater than 40% was not met in CSSS-Ax, however it was achieved in CSSS-B, CSSS-C, and CSSS-F for ECB19RR and ALTQ. Across the sub-populations, the difference in average percentage over the period of record for ALTQ relative to ECB19RR, ranged from a minimum of -20.0% less (CSSS-D) to a maximum of 4.0% more (CSSS-C). ALTQ+ is expected to be very similar to ALTQ with no significant change.

The goal of CEPP South and CERP is to rehydrate the greater Everglades and provide higher volumes of freshwater into ENP. Areas within the eastern marl prairies along the boundary of ENP suffer from over-drainage, reduced water flow, exotic tree invasion and frequent human-induced fires (Lockwood et al. 2003, Ross et al. 2006). To alleviate the perpetual drier conditions and its associated problems, increased water flows within this area are required. Implementation of CEPP South is expected to provide more water to SRS and the eastern marl prairies. Increased hydroperiods within the eastern marl prairies may act to alleviate some of the problems associated with drier conditions and promote a shift in species community composition; however over inundation on the flanks of SRS may shift marl prairie communities to wetter habitats. The western marl prairies, where CSSS-Ax resides may experience a backwater effect due to increased flows in NESRS; however this potential effect may be ameliorated by removal of the L-67 Extension Levee under CEPP South. Additional water being delivered to NESRS may reduce the volume of flow through the S-12 structures. Flows through S-343A/B, S-344, and S-12A, S-12B, S-12C, and S-12D were significantly reduced by 131,200 acre feet per year on average under ALTQ relative to ECB19RR. Decreased flow (67,000 acre feet) was also observed across Transect T17 for ALTQ which is located west of the L-67 Extension in ENP. Reference Table D.2-22 of the 2019 COP BA. The seasonal closures for the S-12A, S-12B, S-343A and S-343B would remain unchanged from the 2016 ERTP BO. However, ALTQ+ includes removal of the seasonal closures at S-344 and includes limited adjustments to the S-332D seasonal pump restrictions. Lifting of S-344 closure dates and extending S-332D full pumping by an additional month, from November 30 to December 31, were based on coordination with the USFWS during development of the proposed COP.

Potential effects to CSSS critical habitat units expected under CEPP South are as follows as described in the 2019 COP BA. It is important to note that implementation of CEPP South features is an identified conservation recommendation within the 2016 ERTP RPA for the CSSS to maintain nesting conditions and suitable habit.

Subpopulation B (CSSS-B/Unit 1) -

> **Dry Nesting Days:** Unit 1 was predicted to meet the target habitat percentage (40%) that experienced > 90 consecutive dry days during the nesting season under ALTQ for 35 years out of the 41 year period of record as compared to 37 years under ECB19RR. ALTQ was observed to score higher than or equal to ECB19RR for 14 years out of the period of record. ALTQ was observed to score less than ECB19RR for 27 years out of the period of record; however when the difference in average percentage over the period of record was calculated it was less than 10% (-

1.1%). An average percentage of greater than 40% was still achieved over the period of record in CSSS-B.

Annual Discontinuous Hydroperiod: In Unit 1, ALTQ failed to meet the target habitat percentage (40%) that experienced a four year running average discontinuous hydroperiod between 90 and 210 days in two consecutive years only one time, which was equivalent to ECB19RR. ALTQ was observed to score higher than or equal to ECB19RR in meeting the target habitat percentage (40%) in a given year 16 times over the period of record. ALTQ was observed to score less than ECB19RR 22 times over the period of record. An average habitat target percentage (40%) was achieved for both ECB19RR and ALTQ with no difference between the two. For Unit 1, the average of the mean four year hydroperiod over the period of record fell within the range of 90 to 210 days under ECB19RR (146 ± 52 days) and ALTQ (148 ± 52 days).

Hydrological conditions within this Unit 1 would support hospitable conditions for nesting sparrows under implementation of the Proposed Action.

Subpopulation C (CSSS-C/Unit 2) –

Dry Nesting Days: Unit 2 was predicted to meet the target habitat percentage (40%) that experienced > 90 consecutive dry days during the nesting season under ALTQ for 36 years out of the 41 year period of record, equivalent to ECB19RR. ALTQ was observed to score higher than or equal to ECB19RR for 33 years out of the period of record. ALTQ was observed to score less than ECB19RR for 8 years out of the period of record; however when the difference in average percentage over the period of record was calculated it was less than 10% (3.4%). An average percentage of greater than 40% was still achieved over the period of record in CSSS-C.

Annual Discontinuous Hydroperiod: In Unit 2, ALTQ failed to meet the target habitat percentage (40%) that experienced a four year running average discontinuous hydroperiod between 90 and 210 days in two consecutive years 12 times, three times less than ECB19RR. ALTQ was observed to score higher than or equal to ECB19RR in meeting the target habitat percentage (40%) in a given year 28 times over the period of record. ALTQ was observed to score less than ECB19RR 10 times over the period of record. An average habitat target percentage (40%) was achieved for both ECB19RR and ALTQ with ALTQ scoring slightly higher (+4%). For Unit 2, the average of the mean four year hydroperiod over the period of record fell within the range of 90 to 210 days under ECB19RR (102 ± 57 days) and ALTQ (109 ± 55 days).

Hydrological conditions within this Unit 2 would support hospitable conditions for nesting sparrows under implementation of the Proposed Action.

Subpopulation D (CSSS-D/Unit 3) –

Dry Nesting Days: Unit 3 was predicted to meet the target habitat percentage (40%) that experienced > 90 consecutive dry days during the nesting season under ALTQ for 21 years out of the 41 year period of record as compared to 24 years under ECB19RR. ALTQ was observed to score higher than or equal to ECB19RR for 23 years out of the period of record. ALTQ was observed to score less than ECB19RR for 28 years out of the period of record; however when the difference in average percentage over the period of record was calculated it was less than 10% (-

7.2%). An average percentage of greater than 40% was still achieved over the period of record in CSSS-D.

Annual Discontinuous Hydroperiod: In Unit 3, ALTQ failed to meet the target habitat percentage (40%) that experienced a four year running average discontinuous hydroperiod between 90 and 210 days in two consecutive years 23 times compared to ECB19RR with 7 times. ALTQ was observed to score higher than or equal to ECB19RR in meeting the target habitat percentage (40%) in a given year 6 times over the period of record. ALTQ was observed to score less than ECB19RR 32 times over the period of record. An average habitat target percentage (40%) was achieved for ECB19RR (50%); however ALTQ achieved an average of only 37%, a difference of -20%. For Unit 3 , the average of the mean four year hydroperiod over the period of record fell within the range of 90 to 210 days under ECB19RR (188 ± 46 days) and slightly above the range for ALTQ (214 ± 50 days).

Hydrological conditions within this Unit 3 would support hospitable conditions for nesting sparrows under implementation of the Proposed Action.

Subpopulation E (CSSS-E/Unit 4) -

Dry Nesting Days: Unit 4 was predicted to meet the target habitat percentage (40%) that experienced > 90 consecutive dry days during the nesting season under ALTQ for 23 years out of the 41 year period of record as compared to 27 years under ECB19RR. ALTQ was observed to score higher than or equal to ECB19RR for 11 years out of the period of record. ALTQ was observed to score less than ECB19RR for 30 years out of the period of record; however when the difference in average percentage over the period of record was calculated it was less than 10% (-7.7%). An average percentage of greater than 40% was still achieved over the period of record in CSSS-E.

Annual Discontinuous Hydroperiod: In Unit 4, ALTQ failed to meet the target habitat percentage (40%) that experienced a four year running average discontinuous hydroperiod between 90 and 210 days in two consecutive years 17 times compared to ECB19RR with 13 times. ALTQ was observed to score higher than or equal to ECB19RR in meeting the target habitat percentage (40%) in a given year 6 times over the period of record. ALTQ was observed to score less than ECB19RR 32 times over the period of record. An average habitat target percentage (40%) was achieved for ECB19RR (44%); however ALTQ achieved an average of only 39%, a difference of -5%. For Unit 4 , the average of the mean four year hydroperiod over the period of record fell within the range of 90 to 210 days under ECB19RR (204 ± 64 days) and slightly above the range for ALTQ (217 ± 65 days).

Hydrological conditions within this Unit 4 would support hospitable conditions for nesting sparrows under implementation of the Proposed Action.

Subpopulation F (CSSS-F/Unit 5) -

Dry Nesting Days: Unit 5 was predicted to meet the target habitat percentage (40%) that experienced > 90 consecutive dry days during the nesting season under ALTQ for 30 years out of the 41 year period of record which was equivalent to ECB19RR. ALTQ was observed to score

higher than or equal to ECB19RR for 31 years out of the period of record. ALTQ was observed to score less than ECB19RR for only 10 years out of the period of record. When the difference in average percentage over the period of record was calculated it was minimal (-1.7%). An average percentage of greater than 40% was achieved over the period of record in CSSS-E.

Annual Discontinuous Hydroperiod: In Unit 5, ALTQ failed to meet the target habitat percentage (40%) that experienced a four year running average discontinuous hydroperiod between 90 and 210 days in two consecutive years 10 times compared to ECB19RR with 11 times. ALTQ was observed to score higher than or equal to ECB19RR in meeting the target habitat percentage (40%) in a given year 24 times over the period of record. ALTQ was observed to score less than ECB19RR 14 times over the period of record. An average habitat target percentage (40%) was achieved for both the ECB19RR (52%) and ALTQ (50%), a difference of -2%. For Unit 5, the average of the mean four year hydroperiod over the period of record fell within the range of 90 to 210 days under ECB19RR (136 ± 72 days) and ALTQ (152 ± 75 days).

Hydrological conditions within Unit 5 would support hospitable conditions for nesting sparrows under implementation of the Proposed Action.

CEPP South may potentially raise groundwater levels in sensitive areas for the sparrow, therefore, hydrological changes associated with implementation of the action are expected to alter some of the physical and biological features essential to the nesting success and overall conservation of the subspecies. The implementation of the Proposed Action is expected to influence wetland hydroperiods causing changes in nesting and marl prairie suitability for the CSSS. The Corps proposes specific minimization measures as part of the proposed COP including species and habitat monitoring to identify population trends for the CSSS currently being conducted in compliance with the 2016 ERTP BO (USFWS 2016) and consistent with that proposed in the 2019 COP BA. Upon construction completion and operation of CEPP South features, the Corps will continue to implement Periodic Scientist Calls (PSC) to provide real-time assessment of conditions within the action area to ensure wildlife recommendations are considered during the water management decision process. Based upon the current information, the Corps' determination is that the Proposed Action may affect the CSSS and its designated critical habitat and is thus requesting formal consultation under ESA for this species.

6.3.2.5 American Alligator and "May Affect Not Likely to Adversely Affect" Determination

The American alligator is listed as threatened by the USFWS due to similarity of appearance to American crocodile, an endangered species. A keystone species within the Everglades ecosystem, the American alligator is dependent on spatial and temporal patterns of water fluctuations that affect courtship and mating, nesting, and habitat use (Brandt and Mazzotti 2000). Historically, American alligators were most abundant in the peripheral Everglades marshes and freshwater mangrove habitats, but are now most abundant in canals and the deeper slough habitats of the central Everglades. Water management practices including drainage of peripheral wetlands and increasing salinity in mangrove wetlands as a result of decreased freshwater flows has limited occurrence of American alligators in these habitats (Craighead 1968, Mazzotti and Brandt 2000).

The Proposed Action is expected to benefit WCA 3B and ENP by increasing flows to the area. The hydrologic effects of the Proposed Action are expected to benefit existing wetlands within the action area. A Habitat Suitability Index (HSI) for alligators was used to predict potential effects of implementation of CEPP (SFNRC 2013a). Reference Figure 6.2 and 6.3 of the 2013 CEPP BA. Results from the prior analysis

indicated that implementation of CEPP would improve alligator habitat suitability throughout WCA 3A and ENP. The greatest increase in benefits was anticipated to occur within northern WCA 3A due to additional water deliveries within this region. Gains were anticipated to be smaller in central WCA 3A, WCA 3B, and ENP. Changes within southern WCA 3A demonstrated potential negative effects to alligator production, however, the effects appeared relatively negligible (South Florida Natural Resources Center 2013). Reference Section 6.2.1 of the 2013 CEPP BA for additional information (USACE 2013). Implementation of CEPP South would result in similar effects as discussed within the 2013 CEPP BA and 2018 CEPP BA; however CEPP South would likely show a reduced beneficial effect in WCA 3B and ENP as additional water (*i.e.* 210,000 acre-feet) is not anticipated to be delivered until CEPP New Water and CEPP South features are completed in the future. Furthermore, operations of the CEPP South features are expected to be subject to current downstream constraints, consistent with ALTQ+ (COP Preferred Plan), which include maintaining the maximum operating limit in the L-29 Canal at or below a specified stage and maintaining required water levels in the residential and agricultural areas in southeastern Miami-Dade County.

For the proposed COP, the same HSI was available to evaluate potential effects on the American alligator a keystone species within the Greater Everglades marsh systems, acting as predator and prey and structuring plant communities (Brandt and Mazzotti, 2000). Figure D.2-58 through Figure D.2-60 in the 2019 COP BA illustrates the difference in alligator breeding potential for ALTQ relative to ECB19RR for a representative average year (1978), dry year (1989), and wet year (1995) within the period of record (1965-2005). During a dry year, observed differences relative to ECB19RR were most often not more than a ± 10% change across the majority of WCA 3 and ENP. During a wet year, increases in alligator habitat suitability greater than 10% were observed for ALTQ in southern WCA 3A and in portions of southern ENP on the flanks of eastern SRS. Areas of decreased suitability by more than 10% were observed in areas of ENP directly east and west of the L-67 Extension. During an average year areas of decreased suitability were also observed in these areas in addition to southern WCA 3A. Figure D.2-61 in the 2019 COP BA shows percent change in mean annual alligator habitat suitability against ECB19RR. Further detail is provided in Section D.2.6.2.5 of the 2019 COP BA and is incorporated by reference.

Alligators are likely to utilize conveyance canals within the project area. Under CEPP South, the entire remaining length of the L-67 Extension Levee (5.5 miles) would be removed and the adjacent borrow canal would be backfilled (5.5 miles). Under CEPP South, approximately 4.0 miles of the east-west agricultural ditch would be backfilled in the Blue Shanty Flowway to improve southerly flow conveyance to the L-29 Canal (**FIGURE 3**). Approximately 1.56 miles are expected to be backfilled under Contract 1 This shallow agricultural ditch is not hydrologically connected to the L-67A Canal and is inaccessible to alligators. Potential adverse effects to alligators that utilize the L-67 Extension Levee, and potentially the east-west agricultural ditch, will occur due to backfilling of the canal under CEPP South; however, these effects are expected to be short term as alligators will expand into other areas of suitable habitat created as a result of CEPP South implementation. Based on the above information, the Corps has determined that CEPP South may affect, but is not likely to adversely affect the American alligator. In the 2013 CEPP BA, the Corps made this same determination. USFWS concurrence on this determination was received with receipt of the 2014 Programmatic BO.

6.3.2.6 American Crocodile and "May Affect Not Likely to Adversely Affect" Determination

American crocodiles are known to exist throughout Florida Bay and Biscayne Bay, specifically around the coastal fringes from Miami to the bottom of the peninsula and up around Naples (Cherkiss 1999, Cherkiss et. al 2011). There are three primary nesting populations in south Florida: Florida Bay, Turkey Point on

Biscayne Bay and Key Largo. The cooling canals of Florida Power and Light's Turkey Point Power Plant support the most successful crocodile nesting population in south Florida (Mazzotti et al. 2007). These cooling canals offer premium nesting habitat because they satisfy the crocodile's two primary nesting requirements – suitable substrate above the normal high water level and adjacent deep-water refugia. While crocodiles prefer sandy substrates, they will often utilize canal spoil banks (Kushlan and Mazzotti 1989). Growth and survival of hatchling and juvenile crocodiles is influenced by salinity. Optimal salinity for these life stages is 0 to 20 psu in the wetlands and coastal creeks during the wet season and partway through the dry season (approximately June through January) (Moler 1992, Mazzotti 1999, Mazzotti et al. 2007). Changes in hydrology that would increase existing salinity conditions in the crocodile reproduction areas would degrade juvenile habitat for the American crocodile. Critical habitat for the American crocodile is illustrated in **FIGURE 9.**

In the 2013 CEPP BA (and referenced in the 2018 CEPP BA) a Habitat Suitability Index (HSI) for juvenile American crocodiles was used to predict potential effects of implementation of CEPP in Florida Bay (Moler 1992, Mazzotti 1999, Mazzotti et al. 2007, Brandt 2013). Reference Figure 6.4 and Figure 6.5 of the 2013 CEPP BA. Results from the prior analysis indicated that implementation of CEPP would improve juvenile crocodile growth and survival at sites along the northern Florida Bay shoreline including Little Blackwater Sound, Long Sound, Joe Bay, Trout Cove, Little Madeira Bay, Terrapin Bay, and Garfield Reference Section 6.2.2 of the 2013 CEPP BA for additional information (USACE 2013). The 2013 CEPP BA noted that improvements in seasonal inflow deliveries to Florida Bay has the potential to improve salinity conditions that are more favorable for juvenile crocodile growth and survival. Nearshore salinity conditions within the coastal estuaries are elevated much of the year as a result of the less than adequate freshwater flow deliveries.

The hydrologic effects presented within the 2014 CEPP Final PIR/EIS represent the combined effects from implementation of the A-2 FEB, the L-6 Diversion, the northern WCA 3A hydropattern restoration components along the L-4 Levee and Canal, the Miami Canal Backfill (north of Interstate 75), and the new or expanded WCA 3A outlet structures along L-67A, along with the associated operations. Average annual overland flow within Central Shark River Slough across RSM-GL Transect 27 in the 2014 CEPP Final PIR/EIS was predicted to significantly increase from an average annual volume of 594,000 acre feet with the FWO to 760,000 acre feet under the CEPP Recommended Plan (28% increase). For the CEPP Recommended Plan, average annual surface water transect flows from southeastern ENP towards Florida Bay were predicted to increase by 2,000 acre feet (7%) for Craighead Basin (RSM-GL Transect 23-A), increase by 8,000 acre feet (11%) from Taylor Slough (Transect 23B), and increase by 13,000 acre feet (9%) for the Eastern Panhandle of ENP (Transect 23-C), resulting in a net increase of approximately 23,000 acre feet compared to the FWO. Reference Appendix C.2.2.7 of the 2014 CEPP Final PIR/EIS. Implementation of CEPP South would result in similar effects as discussed within the 2013 CEPP BA and 2018 CEPP BA; however CEPP South would likely show a reduced beneficial effect in the southern estuaries as additional water (*i.e.* 210,000 acre-feet) is not anticipated to be delivered until CEPP New Water and CEPP South features are completed in the future. Furthermore, operations of the CEPP South features are expected to be subject to current downstream constraints , consistent with ALTQ+ (COP Preferred Plan), which include maintaining the maximum operating limit in the L-29 Canal at or below a specified stage and maintaining required water levels in the residential and agricultural areas in southeastern Miami-Dade County. Potential changes in hydrology within the action area under CEPP South, will be similar to those modeled to support development of ALTQ+ (COP Preferred Plan) as plan formulation efforts for the COP were confined to the existing water budget for inflows to WCA 3A from upstream basins. The Proposed Action is not expected to result in significant adverse impacts to the coastal estuaries. Reference **Section 6.3.2.2** of this BA for a description of expected differences in overland flow to Florida Bay and Biscayne

Bay and resulting changes in salinity expected under ALTQ+ using the RECOVER salinity performance measure. Further detail is provided in Section D.2.6.2.6 of the 2019 COP BA and is incorporated by reference. Based on the above information, the Corps has determined that CEPP South may affect, but is not likely to adversely affect the American crocodile and its designated critical habitat. In the 2013 CEPP BA and 2018 BA, the Corps made this same determination. Concurrence on this determination was previously received with receipt of the 2014 Programmatic BO and in correspondence dated December 21, 2018 from the USFWS.

6.3.2.7 Eastern Indigo Snake and "May Affect Not likely to Adversely Affect" Determination

The Eastern indigo snake is the largest native non-venomous snake in North America, reaching lengths of up to 8.5 feet (Moler 1992). It is an isolated subspecies occurring in southeastern Georgia and throughout peninsular Florida. The Eastern indigo snake prefers drier habitats, but may be found in a variety of habitats including pine flatwoods, scrubby flatwoods, floodplain edges, sand ridges, dry glades, tropical hammocks, edges of freshwater marshes, muckland fields, coastal dunes, cabbage palm hammocks, and xeric sandhill communities (Schaefer and Junkin 1990, USFWS 1999). Eastern indigo snakes need relatively large areas of undeveloped land to maintain their population. In general, adult males have larger home ranges than females or juveniles. In Florida, Smith (2003) indicated that female and male home ranges extend from 5 to 371 acres and 4 to 805 acres, respectively. In south Florida, the Eastern indigo snake is thought to be widely distributed. Given their preference for upland habitats (Steiner et al. 1983), Eastern indigo snakes are not commonly found in great numbers in the wetland complexes of the Everglades region, even though they may be found in pinelands, tropical hardwood hammocks, and mangrove forests in extreme south Florida (Duellman and Schwartz 1958, Steiner et al. 1983). They prefer dry, well drained sandy soils, and commonly use burrows and other natural holes as dens. Steiner et al. (1983) also reported that Eastern indigo snakes inhabit abandoned agricultural land and human-altered habitats in south Florida which would include levees within the WCAs. Eastern indigo snakes were listed as threatened in 1978 due primarily to habitat loss due to development. Further, as habitats become fragmented by roads, Eastern indigo snakes become increasingly vulnerable to highway mortality as they travel through their large territories (Schaefer and Junkin 1990). Declines in Eastern indigo snake populations were also due to over-collection by the pet trade (USFWS 2013).

The Proposed Action is not expected to have significant effects on the upland habitats preferred by this species. Since Eastern indigo snakes occur primarily in upland areas, their presence within the Greater Everglades is somewhat limited, except within existing levees throughout the project area. Under CEPP South, the entire remaining length of the L-67 Extension Levee (5.5 miles) would be removed and the adjacent borrow canal would be backfilled (5.5 miles). Three gated culverts (S-631, S-632, and S-633) would be located in the L-67A levee adjacent to the L-67A Canal and a gated spillway (S-355) would be constructed in the L-29 Canal at the southern extent of the proposed L-67D levee. The L-67D Levee would connect L-67A to L-29 and serve as the eastern perimeter levee for the WCA 3B flowway. Approximately 8 miles of the L-67C Levee, west of the proposed L-67D Levee, would be removed from the area north of Tamiami Trail within the WCA 3B flowway. North of the new L-67D Levee, an approximate 6,000 feet gap would be created to distribute discharges from S-631 to eastern WCA 3B. Approximately 4.3 miles of the L-29 Levee, west of the new L-67D Levee, would be removed. The acreage of levee degrade associated with construction of CEPP South features is listed in **TABLE 6**. Under CEPP South, approximately 4.0 4 miles of the east-west agricultural ditch would be backfilled in the Blue Shanty Flowway to improve southerly flow conveyance to the L-29 Canal (**FIGURE 3**). Approximately 1.56 miles are expected to be backfilled under Contract 1. This shallow agricultural ditch is bound by levees on either side; however side cast from the agricultural ditch is expected to be disturbed during construction. **TABLE 6** has also

been updated from the 2018 CEPP BA to include removal of spoil mounds along the northwestern side of the L-67A canal in the proximity of the S-631, S-632, and 6-333 structures referenced in the 2014 PIR/EIS, but not previously included in this table in the 2018 CEPP BA. Spoil mounds (assumed 3 spoil mounds per structure) will be removed to facilitate sheetflow connectivity with the WCA 3A marsh. The removal of 3 spoil mounds at each structure, equates to an approximate footprint of 10 acres. Eastern indigo snakes could be present within existing levees proposed to be degraded as a result of CEPP South construction. The Corps commits to avoiding and minimizing for adverse effects during construction activities by implementing standard protection measures for the Eastern indigo snake as outlined by the USFWS consistent with the commitment provided in the 2018 CEPP South BA. Reference Section 6.2.3 of the CEPP South BA for additional information.

TABLE 6. ACREAGE OF UPLAND LOST AND UPLAND CREATION UNDER CEPP SOUTH.

Project Feature	Upland Acres Lost	Upland Acres Created
L-67A Spoil Mound Degrade (assumed 3 spoil mounds per S-631, S-632, and S-633) (barren/disturbed to marsh)	10	
L-67C Gap Degrade	9	
L-67C Flowway Degrade	64	
L-29 Degrade	46	
Blue Shanty Levee Creation		113
L-67 Extension Levee Degrade	41	
Total	170	113

*** Reference Table 6-3 of the 2013 CEPP BA for a complete listing of CEPP features proposed within the 2014 CEPP Final PIR/EIS and the associated acres lost (USACE 2013). The above table reflects only those features included in CEPP South and is therefore reflective of the Proposed Action.**

Based on the above information, the Corps has determined that CEPP South may affect, but is not likely to adversely affect the Eastern indigo snake consistent with the determination provided in the 2018 CEPP South BA. Concurrence on this determination was received in correspondence dated December 21, 2018 from the USFWS.

6.3.2.8 Garber's spurge and "May Affect Not Likely to Adversely Affect" Determination

The Garber's spurge is a short lived perennial herb, softly hairy throughout, with, wiry, erect stems and is up to 12 inches longs. Leaves are 0.5 inches long, oval, opposite, with very short stalks and entire or minutely toothed margins. The plant has small cup-like structures holding flowers. The fruit is a pubescent capsule. The seeds either are smooth or have transverse ridges, but are not wrinkled (USFWS 1999). Garber's spurge is known from pine rocklands, coastal flats, coastal grasslands, and beach ridges in Miami-Dade and Monroe counties. It requires open sunny areas and needs periodic fires to maintain habitat

suitability. It is found throughout its historic range. Historically, it occurred from Perrine, Miami-Dade County, and west to Cape Sable, Monroe County, and to the Sand Keys west of Key West, Monroe County (USFWS 1999). Garber's spurge is currently known from about 17 populations, including two in Miami-Dade County and one at Cape Sable (on two Capes within ENP) and on 14 islands in the Keys in Monroe County (Bahia Honda, Big Torch Key, Boca Grande Key, Crawl Key, Key Largo, Cudjoe Key, Fat Deer Key, Grassy Key, Long Key, Long Point Key, Lower Matecumbe Key, Marquesas Keys, Sugarloaf Key, Summerland Key) (USFWS 2007).

The species formerly occurred on at least twice as many islands in the Keys, across a wider range of the Miami-Rock Ridge in Miami-Dade County, and formerly ranged more widely on Cape Sable. The plant is no longer known from Collier County (USFWS 2007). The plant has been documented within Long Pine Key in ENP (USFWS 2007). The plant occurs at low elevations either on thin sandy soils or directly on limestone. It is found in a variety of open to moderately shaded habitat types. In pine rocklands, it grows out of crevices in limestone. On Cape Sable within ENP, it has been reported on hammock edges, open grassy prairies, and backdune swales. In the Florida Keys, it grows on semi-exposed limestone shores, open calcareous salt flats, pine rocklands, calcareous sands of beach ridges, and along disturbed roadsides (USFWS 1999). The survival and recovery of Garber's spurge is threatened by habitat loss from urban development, fire suppression, and exotic plant infestation. In addition, remaining habitat is fragmented and most populations are small, making them more susceptible to extirpation.

The Garber's spurge has the potential to occur within the pine rocklands of ENP on Long Pine Key. Based on the above information, the Corps has determined that CEPP South may affect, but is not likely to adversely affect the Garber's spurge. Concurrence on this determination was previously received with receipt of the 2014 Programmatic BO and in correspondence dated December 21, 2018 from the USFWS.

6.3.2.9 Bartram's Hairstreak Butterfly and Florida Leafwing Butterfly and "May Affect Not Likely to Adversely Affect" Determination

The Bartram's hairstreak is a small butterfly approximately 1 inch (25 millimeters) in length with a forewing length of 0.4 to 0.5 inches (10 to 12.5 mm). Bartram's hairstreak is easily recognized by broad white bands with a black edge that can be seen when the wings are closed. This species does not exhibit sexual or seasonal dimorphism. The Florida leafwing is a medium-sized butterfly approximately 2.75 to 3 inches (76 to 78 millimeters) in length. The open wing surface color is red to red-brown, the closed wing is gray to tan, with a tapered outline, cryptically looking like a dead leaf when the butterfly is at rest. The Florida leafwing exhibits sexual dimorphism, with females being slightly larger and with darker coloring along the wing margins than the males (79 FR 47183).

The Bartram's hairstreak butterfly and the Florida leafwing butterfly both occur within pine rockland habitat, and occasionally associated rockland hammock and hydric pine flatwoods. Reproduction and development occur entirely within the pine rocklands. Immature stages occur entirely on the host plant, the pineland croton (*Croron linearis*). Adults disperse and roost within the pine rockland canopy, and also in associated rockland hammock and hydric pine flatwood vegetation interspersed within these pinelands. The Bartram's hairstreak butterfly has been observed every month throughout its range; however the exact number of broods appears to be sporadic from year to year, with varying peaks in seasonal abundance. The Florida leafwing produces multiple generations per year with an entire life cycle of about 2 to 3 months and maintains continuous broods throughout the year (79 FR 47183).

The Bartram's hairstreak butterfly occurs in ENP, and several pineland fragments on the mainland of Miami-Dade County, the smallest being Navy Wells Pineland Preserve. The Florida leafwing occurs in ENP and until 2006 had occurred on Big Pine Key in the Florida Keys and historically in pineland fragments on mainland Miami-Dade County. The Florida leafwing butterfly was once locally common at Navy Wells Pineland Preserve and the Richmond Pine Rocklands to the northeast of ENP, however, Florida leafwings are not known to have bred at either location in 25 years. The entire remaining population of this species is within ENP. The Bartram's hairstreak and Florida leafwing butterflies can disperse to make use of appropriate habitat in ENP as studies indicate they are able to disperse throughout the landscape as far as 5 kilometers (3 miles) utilizing high quality habitat patches (79 FR 47183). At present, ongoing surveys suggest that the Bartram's hairstreak and Florida leafwing butterflies actively disperse throughout the Long Pine Key region of ENP (79 FR 47183). Five of the seven critical habitat units (BSHB1-BSHB5) are currently occupied by the Bartram's scrub-hairstreak (BSHB1 ENP Miami-Dade County; BSHB2 Navy Wells Pineland Preserve; Miami-Dade County; BSHB3 Camp Owaissa Bauer, Miami-Dade County; BSHB4 Richmond Pine Rocklands, Miami-Dade County; BSHB5 Big Pine Key, Monroe County). One of the four critical habitat units is currently occupied by the Florida leaf wing butterfly (FLB1 ENP Miami-Dade County) (79 FR 47183). Designated critical habitat for the Florida leafwing butterfly occurs entirely within the Bartram's hairstreak units. Reference **FIGURE 10** and **FIGURE 11**.

These butterflies were listed as endangered in part due to their specificity on a single host plant and loss of associated habitat. Pine rockland communities occur on areas of relatively high elevation and consequently, have been subject to intense development pressure. In addition, pine rocklands are a fire-maintained community and require regular burns to maintain the open shrub/herbaceous stratum and to control hardwood encroachment. Fire suppression, fragmentation, invasion by exotic species, and a lowered water table have negatively affected the remaining tracts of pine rocklands. Populations of the Bartram's hairstreak and Florida leafwing butterflies have declined throughout their historic range. Distributions are extremely limited. Additional factors for population declines also include the use of insecticides for mosquito control and collecting (79 FR 47183).

The Bartram's hairstreak butterfly and the Florida leafwing butterfly have the potential to occur within the pine rocklands of ENP on Long Pine Key. Critical habitat for each species has been designated in this area (Critical Habitat Units BSHB1 and FLB1). Reference **Section 6.2.5** for the location within the action area. During plan formulation efforts for COP, the USFWS requested additional RSMGL output for locations (Blocks A, C, D, F2, G, and H) in the pine rocklands identified on Figure D.2-38 in the 2019 COP BA to support evaluation of pine rockland species, including the Florida leafwing butterfly, as the entire population of this species occurs within this map. This analysis was not completed in the 2013 CEPP BA and 2018 CEPP BA. The USFWS used ENP's fire management blocks to represent the overall boundaries of the Everglade pine rocklands. Figure D.2-39 through Figure D.2-44 in the 2019 COP BA illustrate stage duration curves for ECB19RR and ALTQ for each of the requested locations in the pine rocklands. Hydrologic effects for ALTQ+ are expected to be similar however slight increases were observed in below ground water levels. Further detail is provided in Section D.2.6.1.4 of the 2019 COP BA and is incorporated by reference. Potential changes in water levels within these areas may influence the host plant (pineland croton), utilized by these species.

In the 2013 CEPP BA and 2018 CEPP BA, the Corps previously determined that CEPP will have no effect on the Bartram's hairstreak butterfly and Florida leafwing butterfly. The Bartram's hairstreak butterfly and Florida leafwing butterfly were candidate species at the time consultation was completed with the USFWS on the 2014 CEPP PIR/EIS. Critical habitat was not proposed or designated at the time. Concurrence on the determinations for these species was previously received with receipt of the 2014 Programmatic BO

and in correspondence dated December 21, 2018 from the USFWS, however, since then, the Corps has determined that CEPP South may affect, but is not likely to adversely affect the Bartram's hairstreak butterfly and Florida leafwing butterfly and their designated critical habitat based on potential changes in water levels in Long Pine Key as a result of the Proposed Action.

6.3.2.10 Everglades' Bully and "May Affect Not Likely to Adversely Affect" Determination

The Everglades bully was listed as threatened by the USFWS on October 6, 2017 (82 FR 46691). The Everglades bully is a single to many stemmed shrub, 3 to 6 feet (ft.) (1 to 2 meters (m)) tall. The branches are smooth, slightly bent, and somewhat spiny. The leaves are thin, oval-shaped, 0.8 to 2 inches (2 to 5 centimeters (cm)) long, evergreen, lance-shaped, and fuzzy on their undersides. The flowers are in axillary clusters. The Everglades bully grows in pine rockland habitat, marl prairie habitat and within the ecotone between both habitats. These habitats are maintained by regular fire, and are prone, particularly marl prairie, to annual flooding for several months during the wet season. The plant also grows on the sunny edges of rockland hammock habitat which is fire resistant. Little is known about the life history of the sub species, including pollination, biology, seed production or dispersal. Reproduction is sexual with new plants generated from seeds. Flowers are produced from April to May, and fruit ripens from June to July. The plants can stand partial inundation with fresh water for a portion of the year but do not tolerate salinity (82 FR 46694; October 6, 2017).

The historical range of the plant is limited to Collier, Miami-Dade, and Monroe Counties. In Miami-Dade County, the plant was known from central and southern Miami-Dade County along the Miami Rock Ridge, which extends from Long Pine Key in the Everglades northward through urban Miami to the Miami River. In Monroe County, the plant is known from BCNP on the mainland, and was collected as far south as Key Largo, in the Florida Keys. In Collier County, the subspecies has been recorded only within BCNP. The current range of the Everglades bully is BCNP, the Long Pine Key region of ENP and pine rocklands adjacent to ENP. The sub species is extirpated from Key Largo and has not been found in surveys of pine rocklands on Key Largo, Big Pine Key, Cudjoe Key, and Lower Sugarloaf Key. The largest population is currently present at Long Pine Key in ENP. The most recent population estimate within ENP is estimated at 10,000 to 100,000 plants in 2013 (82 FR 46694; October 6, 2017). In Miami-Dade County, outside ENP, plants have been observed at Larry and Penny Thompson Park within the Richmond Pine Rocklands, at Quail Roost Pinelands, at Navy Wells Pineland Preserve, at Sunny Palms Pinelands, and in the pine rocklands at Grant Hammock and Pine Ridge Sanctuary. Surveys in the Gum Slough region of Lostmans Pines in BCNP reported finding the plant with limited distribution; however it is suggested that the Everglades bully is more widespread in BCNP than is currently known (82 FR 46694; October 6, 2017).

Declines of the plant have been attributed to habitat loss from fire suppression or inadequate fire management. Historically, fire served to maintain the boundary between pine rockland and rockland hammock by eliminating encroachment of hardwoods into pine rocklands. Absent natural or prescribed fire, many pine rocklands have succeeded to rockland hammock. Canopy cover on the interior of rockland hammock is too dense to support herbs and smaller shrub species such as the Everglades bully (82 FR 46694; October 6, 2017). Threats from other natural or manmade factors include nonnative, invasive plants; management practices (such as mowing); recreation (including ORV use), effects from small population size and isolation; limited geographic range; and stochastic events including hurricanes, storm surges, and wildfires.

In the 2013 CEPP BA and 2018 CEPP BA, the Corps previously determined that CEPP will have no effect on the Everglades bully. The Everglades bully was a candidate species at the time consultation was

completed with the USFWS on the 2014 CEPP PIR/EIS. Concurrence on the determinations for these species was previously received with receipt of the 2014 Programmatic BO and in correspondence dated December 21, 2018 from the USFWS, however, since then, the Corps has determined that CEPP South may affect, but is not likely to adversely affect the Everglades' bully based on potential changes in water levels in Long Pine Key as a result of the Proposed Action. Reference **Section 6.3.2.9**.

6.3.2.11 Florida Pineland Crabgrass and "May Affect Not Likely to Adversely Affect" Determination

Florida pineland crabgrass was listed as threatened by the USFWS on October 6, 2017 (82 FR 46691). Florida pineland crabgrass is a small perennial clump-grass appearing blue to gray with reddish brown stems, typically 1.37 to 3 ft. (0.5 to 1 m) tall. The leaves form a subtle zig-zag pattern as the leaf blades come off the stem at an angle. Flowers are dull green, very small, and occur on wispy spikes on the ends of the leafy stems with usually only a few flower clusters forming per clump of grass. Little is known about the life history of Florida pineland crabgrass including pollination biology, seed production, or dispersal. The plant produces flowers from summer to late fall on both new and older growth, some plants have been observed to finish seeding as late as December. The plant occurs between the seasonally flooded ecotone of pine rocklands and marl prairies, although the species may overlap somewhat into both habitats. The species can withstand inundation of freshwater for one to several months each year. Pine rocklands and marl prairies are maintained by regular fire, and are prone, particularly marl prairie, to annual flooding for several months during the wet season (82 FR 46693; October 6, 2017).

Florida pineland crabgrass occurred historically within central and southern Miami-Dade County along the Miami Rock Ridge, from southern Miami to the Long Pine Key region of ENP. A single plant was discovered in 1995 within marl prairie habitat at the Martinez Pinelands in the Richmond Pine rocklands. However, this plant has since disappeared. Three other historical occurrences in Miami-Dade County have been documented: (1) a site between Cutler and Longview Camp; (2) Jenkins Homestead; and (3) south Miami. However little is known regarding the status of these populations. The current range of Florida pineland crabgrass includes ENP and BCNP. Surveys suggest the species occurs throughout Long Pine Key of ENP, and is much wider ranging than previously known within ENP. Florida pineland crabgrass is widely distributed within the Lostmans Pines region of BCNP in Monroe County as well. Surveys in 2002 documented the presence of Florida pineland crabgrass within BCNP within this area, representing the first known occurrence of the species outside Miami-Dade County. Subsequent surveys for the species within BCNP have documented up to nine occurrences, some of which contain an estimated 500-600 plants. Surveys conducted within the Gum Slough region of Lostmans Pines indicated that the species is widely distributed in the region with a total of 2,365 plants counted within pineland and sawgrass based survey plots. The range wide population estimate for Florida pineland crabgrass is 100,000 to 200,000 individuals at Long Pine Key and greater than 10,000 individuals within BCNP (82 FR 46695; October 6, 2017). Populations remain abundant within ENP and BCNP. Declines of the plant have been attributed to habitat loss from fire suppression or inadequate fire management. Threats from other natural or manmade factors include nonnative, invasive plants; management practices (such as mowing); recreation (including ORV use), effects from small population size and isolation; limited geographic range; and stochastic events including hurricanes, storm surges, and wildfires.

Florida pineland crabgrass has the potential to occur within the pine rocklands of ENP on Long Pine Key. In the 2013 CEPP BA and 2018 CEPP BA, the Corps previously determined that CEPP will have no effect on Florida pineland crabgrass. Florida pineland crabgrass was a candidate species at the time consultation was completed with the USFWS on the 2014 CEPP PIR/EIS. Concurrence on this determination was previously received with receipt of the 2014 Programmatic BO and in correspondence dated December

21, 2018 from the USFWS, however, since then, the Corps has determined that CEPP South may affect, but is not likely to adversely affect Florida pineland crabgrass based on potential changes in water levels in Long Pine Key as a result of the Proposed Action. Reference **Section 6.3.2.9**.

6.3.2.12 Florida Prairie Clover and "May Affect Not Likely to Adversely Affect" Determination

The Florida prairie clover was listed as endangered by the USFWS on October 6, 2017 (82 FR 46691). The Florida prairie clover is a short-lived (less than 8 years) perennial shrub that is 2.6 to 9.8 ft (0.8 to 3.0 m) tall with a light brown woody stem and non-woody, light brown or reddish branches. The leaves are composed of 9 to 15 oval, gland-tipped leaflets, and are gland-dotted on the underside. The flowers are in small loose heads at ends of hairy, glandular stalks, less than 0.4 in long. The flower color is white and maroon; each of the petals is different lengths and shapes. The fruit is a small one-seeded pod, mostly enclosed by the hairy, gland-dotted calyx. The Florida prairie clover grows in pine rockland, rockland hammock, marl prairie, and coastal berm, and in the ecotones between these habitats. The species may also occur along roadsides within these habitats. The life history of the plant appears to be short-lived (less than 8 years) with a persistent seed bank. The plant produces flowers from October to March and fruit ripen from November to April. Seed maturation is January to May with a peak in February to March. The plants can withstand partial inundation with fresh water for a portion of the year, but do not tolerate salinity (82 FR 46691; October 6, 2017).

The historical range of the plant includes Miami-Dade, Monroe, Collier, and Palm Beach Counties. The current range includes BCNP, three Miami-Dade conservation areas, and three additional unprotected lands within the Cutler Bay region of Miami-Dade County. In 1999, the plant was rediscovered within BCNP. Subsequent surveys of the four extant populations on BCNP occurred after this time. Surveys confirmed the presence of the plant in two locations within BCNP. The first being an area north of Oasis Visitor Center which contained 236 plants (of various ages) and represents the largest extant population within BCNP. The second extant population was confirmed in the Pinecrest region (along Loop Road) of BCNP, a historical location within the Preserve; however, only 17 plants were encountered. The plant was not found at 11-Mile Road, nor at a second location along Loop Road, during the surveys (82 FR 46694; October 6, 2017). Recent surveys have documented its presence along the entry road to Mahogany Hammock, due west of Long Pine Key. Declines of the plant have been attributed to habitat loss from fire suppression or inadequate fire management. Threats from other natural or manmade factors include nonnative, invasive plants; management practices (such as mowing); recreation (including ORV use), effects from small population size and isolation; limited geographic range; and stochastic events including hurricanes, storm surges, and wildfires.

The Florida prairie clover has the potential to occur within the pine rocklands of ENP on Long Pine Key. In the 2013 CEPP BA and 2018 CEPP BA, the Corps previously determined that CEPP will have no effect on the Florida prairie clover. The Florida prairie clover was a candidate species at the time consultation was completed with the USFWS on the 2014 CEPP PIR/EIS. Concurrence on this determination was previously received with receipt of the 2014 Programmatic BO and in correspondence dated December 21, 2018 from the USFWS, however, since then, the Corps has determined that CEPP South may affect, but is not likely to adversely affect the Florida prairie clover based on potential changes in water levels in Long Pine Key as a result of the Proposed Action. Reference **Section 6.3.2.9**.

6.3.2.13 Pineland Sandmat and "May Affect Not Likely to Adversely Affect" Determination

The pineland sandmat was listed as threatened by the USFWS on October 6, 2017 (82 FR 46691). The pineland sandmat is an ascending to erect perennial herb. The stems are hairy and often reddish. The leaf blades range from kidney shaped or triangle shaped and elliptic to oval. The fruit is 2 mm broad and seeds are 1 mm long transversely wrinkled and yellowish in color. Little is known about the life history of the plant, but it is believe to be somewhat long lived. Fruit production is year round with a peak in the fall. The plant occurs in pine rocklands. Pine rocklands are maintained by regular fire, and are prone to annual flooding for several months during the wet season; however the pineland sandmat generally occurs in higher elevation pine rocklands at Long Pine Key in ENP, in areas rarely subject to flooding. The plant can stand partial inundation with fresh water for a portion of the year but does not tolerate salinity. The pineland sandmat occurred historically only within the southern portion of the Miami Rock Ridge from Homestead to the Long Pine Key region of ENP. The pineland sandmat has been encountered consistently within Long Pine Key, as well as Miami-Dade County owned conservation lands adjacent to ENP. The total population size is estimated to be between 15,500 to 146,000 individuals, with the majority of the population occurring on Long Pine Key at the time of listing (82 FR 46697; October 6, 2017). Pine rockland fragments outside of the Everglades represent about half of the subspecies extend range; however the subspecies is most abundant within ENP. Declines of the plant have been attributed to habitat loss from fire suppression or inadequate fire management. Threats from other natural or manmade factors include nonnative, invasive plants; management practices (such as mowing); recreation (including ORV use), effects from small population size and isolation; limited geographic range; and stochastic events including hurricanes, storm surges, and wildfires.

The pineland sandmat has the potential to occur within the pine rocklands of ENP on Long Pine Key. In the 2013 CEPP BA and 2018 CEPP BA, the Corps previously determined that CEPP will have no effect on Florida pineland crabgrass. Pineland sandmat was a candidate species at the time consultation was completed with the USFWS on the 2014 CEPP PIR/EIS. Concurrence on this determination was previously received with receipt of the 2014 Programmatic BO and in correspondence dated December 21, 2018 from the USFWS, however, since then, the Corps has determined that CEPP South may affect, but is not likely to adversely affect pineland sandmat based on potential changes in water levels in Long Pine Key as a result of the Proposed Action. Reference **Section 6.3.2.9**.

6.3.2.14 Blodgett's Silverbush and "May Affect Not Likely to Adversely Affect" Determination

Blodgett's silverbush was listed as threatened by the USFWS on September 29, 2016 (81 FR 66842). Blodgett's silverbush is an erect, perennial shrub or herb that is 4 to 24 inches tall (10 to 60 centimeters) with a woody base and small, green flowers. The stems and leaves are covered with small hairs. The leaves are arranged alternately along the stems and are long and are oval or elliptic in shape and often are colored a distinctive, metallic bluish green when dried. The fruit is a woody capsule which contains the seeds. Flowering and fruiting occur throughout the year (80 FR 58536; September 29, 2015). The plant occurs in pine rocklands, in sunny gaps or edges of rockland hammock and coastal berm, and on roadsides. Blodgett's silverbush historically occurred from central and southern Miami-Dade County from Brickell Hammock to Long Pine Key in ENP, and in Monroe County throughout the Florida Keys from Totten Key south to Key West. Blodgett's silverbush is currently known from central Miami-Dade County from Coral Gables and southern Miami-Dade County to Long Pine Key southwest to Boca Chica Key. The decline of the plant can be largely attributed to loss of pine rocklands habitat to development and modification of this habitat due to inadequate fire management. Habitat loss, fragmentation, and degradation, and associated pressures from increased human population, are major threats. Hurricanes and storm surge

have also impacted population levels. Other threats include competition from non-native plants, management practices on roadsides and disturbed sites (mowing, sodding and herbicide use) and small population size (80 FR 58536; September 29, 2015).

Blodgett's silverbush has the potential to occur within the pine rocklands of ENP on Long Pine Key. In the 2013 CEPP BA and 2018 CEPP BA, the Corps previously determined that CEPP will have no effect on Blodgett's silverbush. Blodgett's silverbush was a candidate species at the time consultation was completed with the USFWS on the 2014 CEPP PIR/EIS. Concurrence on this determination was previously received with receipt of the 2014 Programmatic BO and in correspondence dated December 21, 2018 from the USFWS, however, since then, the Corps has determined that CEPP South may affect, but is not likely to adversely affect Blodgett's silverbush based on potential changes in water levels in Long Pine Key as a result of the Proposed Action. Reference **Section 6.3.2.9**.

6.3.2.15 Everglade Snail Kite and Critical Habitat and "May Affect" Determination

A wide-ranging, New World raptor, the snail kite is found primarily in lowland freshwater marshes in tropical and subtropical America from Florida, Cuba, and Mexico, and south to Argentina and Peru (USFWS 1999). The Florida and Cuban subspecies of the Everglade snail kite, R. sociabilis plumbeus, was initially listed as endangered in 1967 due to its restricted range and highly specific diet (USFWS 1999). Its survival is directly tied to the hydrology, water quality, vegetation composition and structure within the freshwater marshes that it inhabits (Martin et al. 2008, Cattau et al. 2008).

Everglade snail kite habitat consists of freshwater marshes and the shallow vegetated edges of lakes where the apple snail (*Pomacea paludosa*), the Everglade snail kite's main food source, can be found. Snail kite populations in Florida are highly nomadic and mobile; tracking favorable hydrologic conditions and food supplies, and thus avoiding local droughts. Snail kites move widely throughout the primary wetlands of the central and southern portions of Florida. Recent snail kite nesting locations within south Florida are depicted in **FIGURE 3**. The Everglades snail kite is threatened primarily by habitat loss and destruction. Widespread drainage has permanently lowered the water table in some areas. This drainage permitted development in areas that were once Everglade snail kite habitat. In addition to loss of habitat through drainage, large areas of marsh are heavily infested with water hyacinth, which inhibits the Everglade snail kite's ability to see its prey.

The Everglade snail kite has a highly specialized diet typically composed of apple snails, which are found in palustrine, emergent, long-hydroperiod wetlands. As a result, the Everglade snail kite's survival is directly dependent on the hydrology and water quality of its habitat (USFWS 1999). Snail kites require foraging areas that are relatively clear and open in order to visually search for apple snails. Suitable foraging habitat for the Everglade snail kite is typically a combination of low profile marsh and a mix of shallow open water. Shallow wetlands with emergent vegetation such as spike rush (*Eleocharis spp.),* maidencane, sawgrass, and other native emergent wetland plant species provide good Everglade snail kite foraging habitat as long as the vegetation is not too dense to locate apple snails. Dense growth of plants reduces the ability of the Everglade snail kite to locate apple snails and their use of these areas is limited even when snails are in relatively high abundance (Bennetts et al. 2006). Areas of sparse emergent vegetation enable apple snails to climb near the surface to feed, breathe, and lay eggs and thus they are easily seen from the air by foraging Everglade snail kites. Suitable foraging habitats are often interspersed with tree islands or small groups of scattered shrubs and trees which serve as perching and nesting sites.

Snail kite nesting primarily occurs from December to July, with a peak in February-June, but can occur year-round. Nesting substrates include small trees such as willow, cypress (*Taxodium spp.*), and pond apple, and herbaceous vegetation such as sawgrass, cattail, bulrush (*Scirpus validus*), and reed (*Phragmites australis*). Snail kites appear to prefer woody vegetation for nesting when water levels are adequate to inundate the site (USFWS 1999). Nests are more frequently placed in herbaceous vegetation during periods of low water when dry conditions beneath willow stands (which tend to grow to at higher elevations) prevent Everglade snail kites from nesting in woody vegetation (USFWS 1999). Nest collapse is rare in woody vegetation but common in non-woody vegetation, especially on lake margins (USFWS 1999). In order to deter predators, nesting almost always occurs over water (Sykes et al. 1995).

Snail kites construct nests using dry plant material and dry sticks, primarily from willow and wax myrtle (Sykes 1987), with a lining of green plant material that aids in incubation (USFWS 1999). Courtship includes male displays to attract mates and pair bonds form from late November through early June (USFWS 1999). Snail kites will lay between one and five eggs with an average of about three eggs per nest (Sykes 1995, Beissinger 1988). Each egg is laid at about a two-day interval with incubation generally commencing after the second egg is laid (Sykes 1987). Both parents incubate the eggs for a period of 24 to 30 days (Beissenger 1983). Hatching success is variable between years and between watersheds, but averages 2.3 chicks/nest (USFWS 1999, Cattau et al. 2008). February, March, and April have been identified as the most successful months for hatching (Sykes 1987). Snail kites may nest more than once within a breeding season and have been documented to re-nest after both failed and successful nesting attempts (Sykes 1987, Beissinger 1988). Chicks are fed by both parents through the nestling period although ambisexual mate desertion has been documented (USFWS 1999). Young fledge at approximately 9 to 11 weeks of age (Beissenger 1988). Adults forage no more than 6 kilometers from the nest, and generally less than a few hundred meters (Beissenger 1988, USFWS 1999). When food is scarce or ecological and hydrologic conditions are unfavorable, adults may abandon the nest altogether (Sykes et al. 1995).

The persistence of the Everglade snail kite in Florida depends upon maintaining hydrologic conditions that support the specific vegetative communities that compose their habitat along with sufficient apple snail availability across their range each year (Martin et al. 2008). Historically, WCA 3A has been a critical component within the Everglade snail kites' wetland network for foraging and reproduction. High water levels during the wet season are important in maintaining quality wet prairie and emergent slough habitat (USFWS 2010). High water levels and extended hydroperiods have resulted in vegetation shifts within WCA 3A, degrading Everglade snail kite critical habitat. This vegetation transition directly affects Everglade snail kites in several ways, most importantly by reducing the amount of suitable foraging and nesting habitat, and reducing prey abundance and availability. Wetter conditions reduce the amount of woody vegetation within the area upon which Everglade snail kites rely for nesting and perch hunting. In addition, prolonged hydroperiods reduce habitat structure in the form of emergent vegetation, which is critical for apple snail aerial respiration and egg deposition (Turner 1996, Darby et al. 1999). Drying events are essential in maintaining the mosaic of vegetation types needed by a variety of wetland fauna (Sklar et al. 2002), including the Everglade snail kite (USFWS 2010) and its primary food source, the apple snail (Karunaratne et al. 2006, Darby et al. 2008). However, little annual variation in water depths has occurred within WCA 3A since 1993, virtually eliminating the drying events necessary to maintain this mosaic. This is particularly apparent in southwestern WCA 3A, which has experienced excessive ponding in recent years.

Low water levels have an effect on Everglade snail kite nest success in WCA 3A (Cattau et al. 2008). If water levels become too low and food resources become too scarce, adults will abandon their nest sites

and young (Sykes et al. 1995). Predation on nests is also higher when water levels are low. A strong relationship exists between annual minimum stage and juvenile Everglade snail kite survival rate (Martin et al. 2007, Cattau et al. 2008). Due to their inability to move large distances, juvenile Everglade snail kites rely upon the marshes surrounding their nests for foraging. If water levels within these marshes become too low to support foraging (due to low apple snail availability), juvenile survival will be diminished.

Recent scientific information has indicated that apple snail egg production is maximized when dry season low water levels are less than 50 cm (was previously 40 centimeters) but greater than 10 cm (Darby et al. 2002, USFWS 2010). Water depths outside this range can significantly affect apple snail recruitment and survival. If water levels are less than 10 cm, apple snails cease movement and may become stranded, hence they are not only unavailable to foraging Everglade snail kites; they are also unable to successfully reproduce. Depending upon the timing and duration of the dry down, apple snail recruitment can be significantly affected by the truncation of annual egg production and stranding of juveniles (Darby et al. 2008). Since apple snails have a 1.0 to 1.5-year life span (Hanning 1979, Ferrer et al. 1990, Darby et al. 2008), they only have one opportunity (i.e. one dry season) for successful reproduction. Egg cluster production may occur from February to November (Odum 1957, Hanning 1979, Darby et al. 1999); however, approximately 77% of all apple snail egg cluster production occurs between April and June (Darby et al. 2008). Dry downs during peak apple snail egg cluster production substantially reduce recruitment (Darby et al. 2008). The length of the dry down, age, and size of the apple snail are all important factors in apple snail recruitment and survival. Larger apple snails can survive dry downs better than smaller apple snails (Kushlan 1975, Darby et al. 2008).

6.3.2.15.1 Potential Effects to the Everglade Snail Kite

Evaluation of potential effects to Everglade snail kites within the 2013 CEPP BA (and referenced in the 2018 CEPP South BA) included adaptations of ERTP PMs, including depth and recession rate requirements for Everglade snail kites and apple snails, along with an Apple Snail Population Model (SFNRC 2013b). The Apple Snail Population Model describes the dynamics of the apple snail population as a function of hydrology and temperature. Reference Figure 6-14 and Figure 6-15 from the 2013 CEPP BA. Results from the Apple Snail Model indicated that implementation of CEPP was predicted to provide better conditions for apple snail populations as compared to the ECB and FWO Project Condition within WCA 3A, WCA 3B and ENP. In addition to the Apple Snail Population Model, the Everglades Landscape Vegetation Succession model (ELVes) was utilized in the 2013 CEPP BA (and referenced in the 2018 CEPP South BA) in order to analyze anticipated changes in vegetation that may affect nesting and foraging habitat for Everglade snail kites (South Florida Natural Resources Center 2013c). Suitable foraging habitat for the Everglade snail kite is typically a combination of low profile marsh and a mix of shallow open water. For the 2013 CEPP BA, ELVeS was run with nine freshwater marsh/wet prairie communities: (1) open water, (2) open marsh, (3) floating emergent marsh, (4) sawgrass, (5) spikerush, (6) marl prairie, (7) cattail, (8) pineland, and (9) wet scrubland. Reference Figure 6-16 and Figure 6-17 from the 2013 CEPP BA. Results of the modeling indicated that at the broad landscape scale there were few large community changes predicted to occur within most of the CEPP action area. The largest changes were predicted to occur within northwest WCA 3A where increased water deliveries to northern WCA 3A resulted in a decreased wet scrubland community and subsequent increase in sawgrass. Effects of the Blue Shanty flowway in WCA 3B and NESRS were observed as sawgrass within these areas was replaced with floating emergent marsh and open marsh. Deeper water vegetation communities were expected to expand in WCA 3A along the L-67 and L-29 Canals (SFNRC 2013b). Model results did predict an expansion of open water habitat within southern WCA3A where Everglade snail kites are currently known to nest and forage potentially decreasing suitable habitat within this area. However, since the Everglade snail kite is a wide-ranging

species, the 2013 CEPP BA anticipated that these effects would be offset by increases in suitable nesting and foraging habitat throughout the remainder of the CEPP action area. Reference Section 6.2.6 of the 2013 CEPP BA for additional information (USACE 2013).

Hydrologic changes associated with implementation of the project are expected to alter and provide an overall net beneficial effect on Everglade snail kite and apple snail habitat throughout the action area. Implementation of CEPP South would result in similar effects as discussed within the 2013 CEPP BA; however CEPP South would likely show a reduced beneficial effect in WCA 3B and ENP as additional water (*i.e.* 210,000 acre-feet) is not anticipated to be delivered until CEPP New Water and CEPP South features are completed in the future Furthermore, operations of the CEPP South features are expected to be subject to current downstream constraints consistent with ALTQ+ (COP Preferred Plan), which include maintaining the maximum operating limit in the L-29 Canal at or below a specified stage and maintaining required water levels in the residential and agricultural areas in southeastern Miami-Dade County. The L-29 Canal stage is anticipated to be limited to below that identified within the 2014 Final CEPP PIR/EIS which assumed a maximum operating limit of 9.7 feet, NGVD. A potential increase in hydroperiods within WCA 3B and ENP may provide an overall net benefit for Everglade snail kites and apple snail habitat. Increases in volume into NESRS provide an opportunity for improved vegetation, including expansion of sloughs and wet prairies, and contraction of sawgrass ridges which would provide increased foraging and nesting habitat for Everglade snail kite and apple snail. The hydrologic effects presented within the 2014 CEPP Final PIR/EIS represent the combined effects from implementation of the A-2 FEB, the L-6 Diversion, the northern WCA 3A hydropattern restoration components along the L-4 Levee and Canal, the Miami Canal Backfill (north of Interstate 75), and the new or expanded WCA 3A outlet structures along L-67A, along with the associated operations. Within northwest WCA 3A (Gage 3A_NW), compared to the FWO, stages were predicted to significantly increase by 0.6 -0.8 feet for the CEPP Recommended Plan. Stages within northeast WCA 3A (Gage 3A_NE) were predicted to significantly increase by 0.4-0.7 feet, with no significant change during extreme wet conditions and a slight increase in stage for extreme dry conditions (3A_NE). Within east-central WCA 3A (Gage 3A-3), stages were predicted to significantly increase by 0.2-0.5 feet, with no significant change during the wettest 20% of conditions. Proceeding south within central WCA 3A (Gage 3A-4), stages were predicted to generally increase by 0.1-0.2 feet during average to dry conditions, with a slight depth reduction during the wettest 10% of conditions and no significant change during extreme dry conditions. Southern WCA 3A (3A-28) stages were predicted to decrease by 0.1-0.2 feet during the wettest 5% of conditions and slightly decrease during normal to dry conditions. Reference Appendix C.2.2.7 of the 2014 CEPP Final PIR/EIS. Potential changes in hydrology (and effects on the Everglade snail kite) within the action area under CEPP South, will be similar to those modeled to support development of ALTQ+ (COP Preferred Plan) as plan formulation efforts for the COP were confined to the existing water budget for inflows to WCA 3A from upstream basins. Under COP, the L-29 Canal stage is anticipated to be limited to 8.5 feet, NGVD consistent with the operational guidance defined in Appendix A of the 2020 COP EIS (refer to **Section 4.** ALTQ+ increased overland flow, water depths and resulting hydroperiods in portions of ENP, including NESRS and Taylor Slough (USACE 2019). Reference Section D.2.4.2 of the 2019 COP BA for a description of expected differences in water depths and hydroperiods under ALTQ+ in WCA 3 and ENP. Further detail is provided in Section D.2.6.2.8 of the 2019 COP BA for potential effects to Everglade snail kite and is incorporated by reference.

For the proposed COP, the same Apple Snail Population Model was used to evaluate potential effects on the Everglade snail kite within the study area. Figure D.2-62 through Figure D.2-63 in the 2019 COP BA depicts apple snail adult population numbers for a wet year (1995) and a dry year (2004). Results are shown for adult snails (>20 mm) during the spring of a dry year (April 20), before that year's reproductive period. Changes in apple snail population numbers were observed within the boundaries of designated

critical habitat for the Everglade snail kite. During a wet year, ALTQ would increase apple snail population numbers in portions of southern WCA 3A and ENP on the flanks of NESRS; however decreases were observed within portions of eastern WCA 3B. During a dry year, similar pattern were observed; however potential decreases in apple snail population numbers appeared to be of greater magnitude, where they occurred within the study area. Figure D.2-64 in the 2019 COP BA illustrates means of daily percent change in total apple snail population relative to ECB19RR by year for the COP area of interest. ALTQ improved apple snail production in six out of the 11 years, respectively. Observed differences between ALTQ and ECB19RR were most often not more than a ± 10% change.

Furthermore, under CEPP South, approximately 1,003 acres would be managed to enhance flow by reconnecting historic sloughs. This would be accomplished with active vegetation management through use of herbicides (glyphosate) to remove sawgrass that has encroached historic sloughs. Application of herbicides may influence the density of submerged and emergent vegetation in these areas, influencing foraging suitability by allowing snail kites to move through the habitat and detect prey. Only a one time application of glyphosate is expected to occur. Potential effects apple snail populations may be minimal. Application of the herbicide is expected to reduce the sawgrass, creating a more open canopy to allow for periphyton growth. The treated area is expected to become more of a functioning slough in terms of movement of water across the landscape.

For the COP, ELVes was also used. Figure D.2-65 through Figure D.2-67 in the 2019 COP BA illustrate change in vegetation communities relative to ECB19RR for a representative wet year (1995), dry year (1989) and an average year (1978). Changes in vegetation primarily were observed to occur in northern WCA 3A east of the Miami Canal, in portions of WCA 3B, in southern WCA 3A and in portions of ENP including NESRS and Taylor Slough. Decreases in floating emergent marsh were observed in portions of WCA 3A adjacent to the L-67A/C levee. Results of the modeling indicated that at the broad landscape scale there were few large community changes predicted to occur within most of the action area.

In addition to the Apple Snail Population Model and ELVes, an ESA incidental take trigger developed during consultation between the Corps and the USFWS for the 2016 ERTP BO was also used to evaluate potential effects on the Everglade snail kite for the proposed COP. The 2016 ERTP BO includes exceedance criteria that are linked to habitat quality as a surrogate for incidental take of snail kites. Per the 2016 ERTP BO, those exceedance criteria are as follows: (1) Dry Season High Water: Number of days when maximum water levels exceed 9.2 feet, NGVD at gauge 3AS3W1 on or after April 15 in two consecutive years; (2) Wet Season High Water: Number of days maximum water levels exceed 10.5 feet, NGVD at gauge 3AS3W1 for 60 days in two consecutive years (June 1 – December 31); and (3) Recession Dry Season Amplitude: WCA 3A stage difference as measured at specific gages should not recede by more than 1.7 feet, NGVD from January 1 through May 31 or the onset of the wet season, whichever is sooner as measured in two consecutive years.

USFWS requested that these exceedance criteria be utilized during hydrologic modeling for the COP to understand potential effects on the Everglade snail kite within WCA 3A. High water stages may reduce the abundance, growth, and reproduction of apple snails and reduce woody vegetation that kites use for nesting and perch-hunting. Depending on the amount of lost snail productivity and the initial snail population size, a single year of high water during the dry season can result in long-term impacts to apple snail populations and decrease numbers of snail kite nest initiations, nest success, and juvenile survival in an area, as has been observed in WCA 3A. Rapid recession rates during the breeding season can also result in decreased nest success (through increased predation or decreased forage availability) and decreased juvenile survival (due to decreased forage availability) (USFWS 2016). Table D.2-26 in the 2019

COP BA shows the number of times in the period of record (1965-2005) when maximum water levels exceed 9.2 feet, NGVD at gage 3AS3W1 on or after April 15 in two consecutive years. ALTQ reduced the number of years the threshold was exceeded relative to ECB19RR by three events. The number of times in the period of record (1965-2005) when maximum water levels exceed 10.5 feet, NGVD at gage 3AS3W1 for 60 days (June 1-December 31) in two consecutive years for ALTQ did not deviate from ECB19RR. ALTQ performed equivalent to ECB19RR. ALTQ reduced the number of years over the period of record (1965-2005) the WCA 3A stage difference receded by more than 1.7 feet, NGVD from January 1 through May 31 in a given year at gages 3A-4 and 3AS3W1, however the exceedance criteria was increased under ALTQ at gages 3A28 and W2..

The implementation of the Proposed Action is expected to influence wetland hydroperiods causing changes in foraging suitability for Everglade snail kite. Under CEPP South, the Corps will continue to evaluate how water management operations may be conducted to maximize beneficial effects for the Everglade snail kite. The Corps proposes specific minimization as part of CEPP South including species and habitat monitoring to identify population trends for the Everglade snail kite currently being conducted in compliance with the 2016 ERTP BO (USFWS 2016) and consistent with that proposed in the 2019 COP BA. Upon construction completion and operation of CEPP South features, the Corps will continue to implement PSC to provide real-time assessment of conditions in the study area to ensure wildlife recommendations are considered during the water management decision process. In addition, the Corps will continue to implement PSC to provide real-time assessment of conditions within the action area to ensure wildlife recommendations are considered during the water management decision process. Based upon the current information, the Corps' determination is that the Proposed Action may affect the Everglade snail kite and its designated critical habitat and is thus requesting formal consultation under ESA for this species.

6.3.2.16 Wood Stork and "May Affect" Determination

The wood stork is a large, white, long-legged wading bird that relies upon shallow, freshwater wetlands for foraging. Black primary and secondary feathers, a black tail and a blackish, featherless neck distinguish the wood stork from other wading birds species. This species was federally listed as endangered under the ESA on February 28, 1984 (49 FR 7332). On June 30, 2014 (79 FR 37077), USFWS reclassified the status of wood stork from endangered to threatened due to improvement in the species overall status. Although habitat loss and fragmentation continue to impact the species, the USFWS cited that due to increases in abundance of the breeding population as well as a significant expansion of its breeding range, there is a decrease in the severity and magnitude of these threats. Therefore, this species is no longer in danger of extinction throughout their range and has been reclassified as threatened. No critical habitat has been designated for the wood stork; therefore, none will be affected.

The wood stork is found from northern Argentina, eastern Peru and western Ecuador north to Central America, Mexico, Cuba, Hispaniola, and the southeastern United States (AOU 1983). Only the population segment that breeds in the southeastern United States is listed as threatened. In the United States, this species is historically known to nest in all coastal states from Texas to South Carolina (Wayne 1910; Bent 1926; Howell 1932; Oberholser 1938; Dusi and Dusi 1968; Cone and Hall 1970; Oberholser and Kincaid 1974). Dahl (1990) estimates these states lost about 38 million acres, or 45.6 percent, of their historic wetlands between the 1780s and the 1980s. However, it is important to note wetlands and wetland losses are not evenly distributed in the landscape. Hefner et al. (1994) estimated 55 percent of the 2.3 million acres of the wetlands lost in the southeastern United States between the mid-1970s and mid-1980s were

located in the Gulf-Atlantic coastal flats. These wetlands were strongly preferred by wood storks as nesting habitat.

The decline in the United States population of the wood stork is thought to be related to one or more of the following factors: (1) reduction in the number of available nesting sites; (2) lack of protection at nesting sites; and (3) loss of an adequate food base during the nesting season (Ogden and Nesbitt 1979). Ogden and Nesbitt (1979) indicate a reduction in nesting sites is not the cause in the population decline, because the number of nesting sites used from year to year is relatively stable. Ogden and Nesbitt suggest loss of an adequate food base is a cause of wood stork declines. The primary cause of the wood stork population decline in the United States is loss of wetland habitats or loss of wetland function resulting in reduced prey availability. Almost any shallow wetland depression where fish become concentrated, either through local reproduction or receding water levels, may be used as feeding habitat by the wood stork during some portion of the year; but only a small portion of the available wetlands support foraging conditions (high prey density and favorable vegetation structure) that wood storks need to maintain growing nestlings. Browder et al. (1976) and Browder (1978) documented the distribution and the total acreage of wetland types occurring south of Lake Okeechobee, Florida, for the period 1900 through 1973. They combined their data for habitat types known to be important foraging habitat for wood storks (cypress domes and strands, wet prairies, scrub cypress, freshwater marshes and sloughs, and saw grass marshes) and found these habitat types have been reduced by 35 percent since 1900. Currently, wood stork nesting occurs in Florida, Georgia, South Carolina, and North Carolina.

Wood storks forage primarily within freshwater marsh and wet prairie vegetation types, but can be found in a wide variety of wetland types, as long as prey are available and the water is shallow and open enough to hunt successfully (Ogden et al. 1978; Browder 1984; Coulter 1987; Gawlik and Crozier 2004; Herring and Gawlik 2007). Calm water, about 5 to 25 centimeters in depth, and free of dense aquatic vegetation is ideal, however, wood storks have been observed foraging in ponds up to 40 centimeters in depth (Coulter and Bryan 1993; Gawlik 2002). Typical foraging sites include freshwater marshes, ponds, hardwood and cypress swamps, narrow tidal creeks or shallow tidal pools, and artificial wetlands such as stock ponds, shallow, seasonally flooded roadside or agricultural ditches, and managed impoundments (Coulter et al. 1999; Coulter and Bryan 1993; Herring and Gawlik 2007). During nesting, these areas must also be sufficiently close to the colony to allow wood storks to efficiently deliver prey to nestlings.

Wood storks feed almost entirely on fish between 2 and 25 centimeters (1 to 10 inches) in length (Kahl 1964; Ogden et al. 1976; Coulter 1987) but may occasionally consume crustaceans, amphibians, reptiles, mammals, birds, and arthropods. Wood storks generally use a specialized feeding behavior called tactilocation, or grope feeding, but also forage visually under some conditions (Kushlan 1979). Wood storks typically wade through the water with their beaks immersed and open about 7 to 8 centimeters (2.5 to 3.5 inches). When the wood stork encounters prey within its bill, the mandibles snap shut, the head is raised, and the food swallowed (Kahl 1964). Occasionally, wood storks stir the water with their feet in an attempt to startle hiding prey (Rand 1956; Kahl 1964; Kushlan 1979). This foraging method allows them to forage effectively in turbid waters, at night, and under other conditions when other wading birds that employ visual foraging may not be able to forage successfully.

Studies on fish consumed by wood storks have shown that wood storks are highly selective in their feeding habits with sunfish and four other species of fish comprising the majority of their diet (Ogden et al. 1976). Ogden et al. (1976, 1978) noted that the key species consumed by wood storks included sunfishes (*Centrarchidae*), yellow bullhead (*Italurus natalis*), marsh killifish *(Fundulus confluentus*), flagfish (*Jordenella floridae*) and sailfin molly (*Poecilia latipinna*).

These species were also observed to be consumed in much greater proportions than they occur at feeding sites, and abundant smaller species (e.g., mosquitofish (*Gambusia spp*.), least killifish (*Heterandria formosa*), bluefin killifish (*Lucania goodei*) are under-represented, which the researchers believed was probably because their small size does not elicit a bill-snapping reflex in these tactile feeders (Coulter et al. 1999). Their studies also showed that in addition to selecting larger species of fish, wood storks consumed individuals that are significantly larger (greater than 3.5 centimeters) than the mean size available (2.5 centimeters), and many were greater than one-year old (Ogden et al. 1976; Coulter et al. 1999).

Hydrologic and environmental characteristics have strong effects on fish density, and these factors may be some of the most significant in determining foraging habitat suitability, particularly in southern Florida. Within the wetland systems of southern Florida, the annual hydrologic pattern is very consistent, with water levels rising over three feet during the wet season (June-November), and then receding gradually during the dry season (December-May). Wood storks nest during the dry season, and rely on the drying wetlands to concentrate prey items in the ever-narrowing wetlands (Kahl 1964). Because of the continual change in water levels during the wood stork nesting period, any one site may only be suitable for wood stork foraging for a narrow window of time when wetlands have sufficiently dried to begin concentrating prey and making water depths suitable for storks to access the wetlands (Gawlik 2002; Gawlik et al. 2004). Once the wetland has dried to where water levels are near the ground surface, the area is no longer suitable for wood stork foraging, and will not be suitable until water levels rise and the area is again repopulated with fish. Consequently, there is a general progression in the suitability of wetlands for foraging based on their hydroperiods, with the short hydroperiod wetlands being used early in the season, the mid-range hydroperiod sites being used during the middle of the nesting season, and the longest hydroperiod areas being used later in the season (Kahl 1964; Gawlik 2002).

Dense submerged and emergent vegetation may reduce foraging suitability by preventing wood storks from moving through the habitat and interfering with prey detection (Coulter and Bryan 1993). Some submerged and emergent vegetation does not detrimentally affect wood stork foraging, and may be important to maintaining fish populations. Wood storks tend to select foraging areas that have an open canopy, but occasionally use sites with 50 to 100 percent canopy closure (Coulter and Bryan 1993; Coulter et al. 1999). Foraging sites with open canopies are more easily detected from overhead as wood storks are searching for food. Gawlik (2002) characterized wood storks as “searchers” that employ a foraging strategy of seeking out areas of high density prey and optimal (shallow) water depths, and abandoning foraging sites when prey density begins to decrease below a particular efficiency threshold, but while prey was still sufficiently available that other wading bird species were still foraging in large numbers (Gawlik 2002). Wood stork choice of foraging sites was significantly related to both prey density and water depth (Gawlik 2002). Because of this strategy, wood stork foraging opportunities are more constrained than many of the other wading bird species (Gawlik 2002).

Wood storks generally forage in wetlands between 0.5 kilometer and 74.5 kilometer away from the colony site (Bryan and Coulter 1987; Herring and Gawlik 2007), but forage most frequently within 10-20 kilometer (12 miles) of the colony (Coulter and Bryan 1993; Herring and Gawlik 2007). Maintaining this wide range of feeding site options ensures sufficient wetlands of all sizes and varying hydroperiods are available, during shifts in seasonal and annual rainfall and surface water patterns, to support wood storks. Adults feed farthest from the nesting site prior to laying eggs, forage in wetlands closer to the colony site during incubation and early stages of raising the young, and then farther away again when the young are able to fly. Wood storks generally use wet prairie ponds early in the dry season then shift to slough ponds later in the dry season thus following water levels as they recede into the ground (Browder 1984).

Wood stork nesting habitat consists of mangroves as low as 1 meter (3 feet), cypress as tall as 30.5 meters (100 feet), and various other live or dead shrubs or trees located in standing water (swamps) or on islands surrounded by relatively broad expanses of open water (Palmer 1962; Rodgers et al. 1987; Ogden 1991; Coulter et al. 1999). Wood storks nest colonially, often in conjunction with other wading bird species, and generally occupy the large-diameter trees at a colony site (Rodgers et al. 1996). The same colony site will be used for many years as long as the colony is undisturbed and sufficient foraging habitat remains in the surrounding wetlands. However, not all wood storks nesting in a colony will return to the same site in subsequent years (Kushlan and Frohring 1986). Natural wetland nesting sites may be abandoned if surface water is removed from beneath the trees during the nesting season (Rodgers et al. 1996). In response to this type of change to nest site hydrology, wood storks may abandon that site and establish a breeding colony in managed or impounded wetlands (Ogden 1991). Wood storks that abandon a colony early in the nesting season due to unsuitable hydrological conditions may re-nest in other nearby areas (Borkhataria et al. 2004; Crozier and Cook 2004).

The wood stork life history strategy has been characterized as a "bet-hedging" strategy (Hylton et al. 2006) in which high adult survival rates and the capability of relatively high reproductive output under favorable conditions allow the species to persist during poor conditions and capitalize on favorable environmental conditions. This life-history strategy may be adapted to variable environments (Hylton et al. 2006) such as the wetland systems of southern Florida. Nest initiation date, colony size, nest abandonment, and fledging success of a wood stork colony vary from year to year based on availability of suitable wetland foraging areas, which can be affected by local rainfall patterns, regional weather patterns, and anthropogenic hydrologic management (USFWS 1997; Frederick and Ogden 2001). While the majority of wood stork nesting occurs within traditional wood stork rookeries, a handful of new wood stork nesting colonies are discovered each year (Meyer and Frederick 2004; SFWMD 2004, 2009). These new colony locations may represent temporary shifts of historic colonies due to changes in local conditions, or they may represent formation of new colonies in areas where conditions have improved.

Breeding wood storks are believed to form new pair bonds every season. First age of breeding has been documented in 3- to 4-year-old birds but the average first age of breeding is unknown. Eggs are laid as early as October in south Florida and as late as June in north Florida (Rodgers 1990; USFWS 1999). A single clutch of two to five (average three) eggs is laid per breeding season but a second clutch may be laid if a nest failure occurs early in the breeding season (Coulter et al. 1999). There is variation among years in the clutch sizes, and clutch size does not appear to be related to longitude, nest data, nesting density, or nesting numbers, and may be related to habitat conditions at the time of laying (Frederick 2009; Frederick et al. 2009). Egg laying is staggered and incubation, which lasts approximately 30 days, begins after the first egg is laid. Therefore, the eggs hatch at different times and the nestlings vary in size (Coulter et al. 1999). In the event of diminished foraging conditions, the youngest birds generally do not survive.

The young fledge in approximately eight weeks but will stay at the nest for three to four more weeks to be fed. Adults feed the young by regurgitating whole fish into the bottom of the nest about three to ten times per day. Feedings are more frequent when the birds are young (Coulter et al. 1999). When wood storks are forced to fly great distances to locate food, feedings are less frequent (Bryan et al. 1995). The total nesting period from courtship and nest-building through independence of young, lasts approximately 100 to 120 days (Coulter et al. 1999). Within a colony, nest initiation may be asynchronous, and consequently, a colony may contain active breeding wood storks for a period significantly longer than the 120 days required for a pair to raise young to independence. Adults and independent young may continue to forage around the colony site for a relatively short period following the completion of

breeding. Appropriate water depths for successful foraging are particularly important for newly fledged juveniles (Borkhataria et al. 2008).

Wood storks produce an average of 1.29 fledglings per nest and 0.42 fledglings per egg which is a probability of survivorship from egg laying to fledgling of 46 percent (Rodgers and Schwikert 1997). However, in 2009, which was a banner year for nesting, over 2.6 young fledged from successful nests (Frederick et al. 2009). The greatest losses occur from egg laying to hatching with a 30 percent loss of the nest productivity. From hatching to nestlings of two weeks of age, nest productivity loss is an additional 8 percent. Corresponding losses for the remainder of the nesting cycles are on the average of a six percent per two week increase in age of the nestling (Rodgers and Schwikert 1997).

Receding water levels are necessary in south Florida to concentrate suitable densities of forage fish (Kahl 1964; Kushlan 1979) to sustain successful wood stork nesting. During the period when a nesting colony is active, wood storks are dependent on consistent foraging opportunities in wetlands within their core foraging area (30 kilometer radius) surrounding a nest site. The greatest energy demands occur during the middle of the nestling period, when nestlings are 23 to 45 days old (Kahl 1964). The average wood stork family requires 201 kilograms (443 pounds) of fish during the breeding season, with 50 percent of the nestling stork's food requirement occurring during the middle third of the nestling period (Kahl 1964). Although the short hydroperiod wetlands support fewer fish and lower fish biomass per unit area than long hydroperiod wetlands, these short hydroperiod wetlands were historically more extensive and provided foraging areas for wood storks during colony establishment, courtship and nest-building, egg-laying, incubation, and the early stages of nestling provisioning. This period corresponds to the greatest periods of nest failure (i.e. 30 % and 8%, respectively from egg laying to hatching and from hatching to nestling survival to two weeks) (Rodgers and Schwikert 1997).

The annual climatological pattern that appears to stimulate the heaviest nesting efforts by wood storks is a combination of the average or above-average rainfall during the summer rainy season prior to colony formation and an absence of unusually rainy or cold weather during the following winter-spring nesting season. This pattern produces widespread and prolonged flooding of summer marshes that maximizes production of freshwater fishes, followed by steady drying that concentrates fish during the dry season when storks nest (Kahl 1964; Frederick et al. 2009). However, frequent heavy rains during nesting can cause water levels to increase rapidly. The abrupt increases in water levels during nesting, termed reversals (Crozier and Gawlik 2004), may cause nest abandonment, re-nesting, late nest initiation, and poor fledging success.

Following the completion of the nesting season, both adult and fledgling wood storks generally begin to disperse away from the nesting colony. In southern Florida, both adult and juvenile wood storks consistently disperse northward following fledging in what has been described as a mass exodus (Kahl 1964). Both adult and juvenile wood storks return southward in the late fall and early winter months.

6.3.2.16.1 Potential Effects to the Wood Stork

Wood storks nest in response to the availability of prey fish across southern Florida. Large expanses of seasonally flooded marsh coupled with consistent drydown patterns are key for concentrating prey fish and successful nesting seasons. The availability of small fish that are seasonally concentrated on the landscape during drying periods is a key factor in determining reproductive success. Preservation and/or restoration of natural hydrologic processes is critical to the survival of the wood stork, as it depends on open water to support its nesting, roosting, and foraging sites. The generally accepted explanation for

the decline of the wood stork is the reduction in food base (primarily small fish) necessary to support breeding colonies. This reduction is attributed to loss of wetland habitat as well as to changes in water hydroperiods from draining wetlands and changing water regimes by constructing levees, canals, and floodgates to alter water flow in south Florida.

Several models of wading birds were used to assess potential affects to wading birds within the Greater Everglades as a result of implementation of CEPP within the 2013 CEPP BA (and referenced in the 2018 CEPP south BA) including wading bird species distribution (Beerens 2013). Reference Figures 6-20 through Figures 6-23 of the 2013 CEPP South BA. Results from Beerens 2013 indicated that wood storks would more frequently use areas of northern WCA 3A, WCA 3B, and southern ENP under CEPP compared to the ECB and FWO Project Condition. Wading bird use was predicted to increase for wood stork colonies previously and/or currently located within WCA 3B (3B Mud East), along Tamiami Trail (Tamiami Trail East 1, Tamiami Trail East 2, and Tamiami Trail West), and for several colonies located in ENP (Grossman West, Rookery Branch). Wading bird use was predicted to remain stable or decrease for several colonies located in southern WCA 3A adjacent to L-28 (Crossover, Jetport, Jetport South, Hidden); however the 2013 CEPP BA noted the potential for these wood stork colonies to utilize adjacent areas where foraging and habitat suitability are increasing. Reference Section 6.2.7 of the 2013 CEPP BA for additional information (USACE 2013).

The hydrologic effects presented within the 2014 CEPP Final PIR/EIS represent the combined effects from implementation of the A-2 FEB, the L-6 Diversion, the northern WCA 3A hydropattern restoration components along the L-4 Levee and Canal, the Miami Canal Backfill (north of Interstate 75), and the new or expanded WCA 3A outlet structures along L-67A, along with the associated operations. Total net structural inflows to NESRS (via the L-29 Canal), computed as the sum of S-333, S-3555A, S-355B, L-29 Levee Gap, and S-356 minus S-334) were predicted to significantly increase to 761,000 acre feet with implementation of the CEPP Recommended Plan, compared to the FWO (94,000 acre feet average annual). Stages were predicted to significantly increase by 0.5-0.9 feet under all hydrologic conditions at NESRS-2 within northeast ENP with similar trends also observed further south at the NESRS-1 monitoring gage. Average annual overland flow to NESRS across RSM-GL Transect 18 (southward flows in northern ENP south of Tamiami Trail and east of the L-67 Extension) was also predicted to significantly increase to 754,000 acre feet under the CEPP Recommended Plan compared to the FWO (75,000 acre feet average annual).

The 2014 CEPP Final PIR/EIS included three new inflow structures to WCA 3B along L-67A (in addition to increased capacity at S-333), resulting in an additional WCA 3B inflow design capacity of 1500 cfs. Compared to the FWO, average annual combined structural inflows to WCA 3B from WCA 3A were predicted to significantly increase from 327,000 acre feet in the FWO to 544 thousand acre feet under the CEPP Recommended Plan. The WCA 3B outflow configuration for the CEPP Recommended Plan included the removal of the L-29 Levee within the Blue Shanty flowway. The CEPP Recommended Plan, with the Blue Shanty flowway and L-29 Levee Gap, were predicted to achieve significant north-to-south surface water flow directionality within WCA 3B only in the spatial footprint of the Blue Shanty flowway. The CEPP FWO included the existing S-151 gated culvert as the sole structural inflow to WCA 3B (327,000 acre feet average annual) and the existing S-355 A and B spillways as the only structural outflows from WCA 3B (2,000 acre feet average annual). Compared to the FWO, average annual combined structural outflows from WCA 3B to the L-29 Canal and ENP NESRS were predicted to significantly increase from less than 2 thousand acre feet in the FWO to 240,000 acre feet with more than 99 percent of these WCA 3B outflows in discharged across the L-29 Levee degrade within the Blue Shanty flowway. For the CEPP Recommended Plan, the peak stage within the Blue Shanty flowway was predicted at 9.70 feet NGVD, with stages

exceeding 8.0 feet NGVD for approximately 42% of the period of simulation. Peak stages within central WCA 3B (Site 71) were predicted to exceed 9.0 feet NGVD for only 15 days (0.10%) of the RSM-GL 1965-2005 period of simulation for the CEPP Recommended Plan, and WCA 3B stages were predicted to be above 8.0 feet NGVD for approximately 22-24% or the period of simulation relative to the FWO.

Western Shark River slough (WSRS) located to the west of L-67 Extension Levee and bounded on the north by Tamiami Trail, is primarily influenced by rainfall and water management operations at the S-12 structures (A, B, C and D). Compared to the FWO, within northwest ENP (NP-201) stages were predicted to significantly decrease under the CEPP Recommended Plan by 0.1-0.3 feet under both wet and dry hydrologic conditions while stages were predicted to slightly increase or remain unchanged from the FWO for normal hydrologic conditions between approximately 35% and 55% on the stage duration curve. Changes to the average annual overland flows to WSRS across RSM-GL Transect 17 (southward flows in northern ENP south of Tamiami Trail and west of the L-67 Extension) were predicted to significantly decrease from 369,000 acre feet average annual under the FWO to 319 thousand acre feet. To the south and west, stages at the NP-205 monitoring gage (used as an indicator for CSSS-A hydrology) were predicted to significantly decrease in stage by 0.1- 0.2 feet under all hydrologic conditions for the CEPP. Reference Appendix C.2.2.7 of the 2014 CEPP Final PIR/EIS.

Since features authorized within CEPP South remain unchanged, implementation of CEPP South would result in similar effects as discussed within the 2013 CEPP BA and 2018 CEPP BA; however CEPP South would likely show a reduced beneficial effect in WCA 3B and ENP as additional water (*i.e.* 210,000 acre-feet) is not anticipated to be delivered until CEPP New Water and CEPP South features are completed in the future Furthermore, operations of the CEPP South features are expected to be subject to current downstream constraints consistent with ALTQ+ (COP Preferred Plan), which include maintaining the maximum operating limit in the L-29 Canal at or below a specified stage and maintaining required water levels in the residential and agricultural areas in southeastern Miami-Dade County. Potential changes in hydrology within the action area under CEPP South, will be similar to those modeled to support development of ALTQ+ (COP Preferred Plan) as plan formulation efforts for the COP were confined to the existing water budget for inflows to WCA 3A from upstream basins. Potential changes in hydrology within the action area under CEPP South, will be similar to those modeled to support development of ALTQ+ (COP Preferred Plan) as plan formulation efforts for the COP were confined to the existing water budget for inflows to WCA 3A from upstream basins. Under COP, the L-29 Canal stage is anticipated to be limited to 8.5 feet, NGVD consistent with the operational guidance defined in Appendix A of the 2020 COP EIS (refer to **Section 4**). ALTQ+ increased overland flow, water depths and resulting hydroperiods in portions of ENP, including NESRS and Taylor Slough (USACE 2019). Reference Section D.2.4.2 of the 2019 COP BA for a description of expected differences in water depths and hydroperiods under ALTQ+ in WCA 3 and ENP. Further detail is provided in Section D.2.6.2.9 of the 2019 COP BA for potential effects to the wood stork and is incorporated by reference.

For the proposed COP, an ecological planning tools was available to evaluate potential effects on wading birds in the study area. The Wading Bird Distribution Evaluation Model (WADEM) was utilized to determine spatially-explicit changes in high quality foraging conditions for wading birds (Beerens et al 2015a, Beerens et al 2015b, and Cook and Kobza 2009). Figure D.2-70 in the 2019 COP BA shows the mean spatial foraging conditions index over the months of March and April over the years 1975-2005 and the percent change between ALTQ and ECB19RR for the wood stork. Observed differences between ALTQ and ECB19RR were most often not more than a ± 10% change across the majority of WCA 3 and ENP. Improvements in foraging conditions were observed in NESRS. Figure D.2-71 in the COP BA shows percent change in mean daily foraging index for the wood stork for each year in the modeled period of record.

ALTQ improved the mean daily foraging index with the exception of six years in the 31 year period of record.

In addition to WADEM, an ESA incidental take trigger developed during consultation between the Corps and the USFWS for the 2016 ERTP BO was utilized during plan formulation for the COP. The 2016 ERTP BO includes a reinitiation trigger that evaluates water depths greater than 16 inches (41 cm) from March 1 through May 31 throughout WCA 3A as measured by the two gauge average (based upon a ground surface elevation of 8.4 feet NGVD) at gauges 3A-3 (Site 63) and 3A-4 (Site 64). Per the 2016 ERTP BO, incidental take will be exceeded if operations results in a water depth greater than 16 inches (41 centimeters) from March 1 through May 31 throughout WCA 3A for two consecutive years. The annual hydrologic pattern in south Florida is consistent, with water levels rising during the wet season (June through October), then receding gradually during the dry season (November to May).

Wood storks nest during the dry season and rely on the drying wetlands to concentrate prey items for optimal foraging. Once the wetland has dried to where water levels are near the ground surface, the area is no longer suitable for wood stork foraging and will not be suitable again until water levels rise and the area is repopulated with fish. Wood storks prefer calm water, approximately 2 to 16 inches deep and free of dense vegetation for foraging (Coulter and Bryan 1993). More recently, Beerens and Cook (2010) defined a foraging depth range of -0.31 to 1.34 ft. (-9.33 to 41.26 cm) for wood storks feeding in WCA 3A. A water depth greater than 16 inches (41 cm) across WCA 3A during the nesting season would lower the suitability of foraging habitat to the point where the ability for wood storks to forage would be severely impaired and most likely result in widespread abandonment of nests and fledglings within the affected colony (USFWS 2016). Table D.2-25 in the 2019 COP BA shows the number of times in the period of record (1965-2005) when water depths exceeded 16 inches (41 cm) from March 1 through May 31 throughout WCA 3A in two consecutive years as measured by the two gage average (based upon a ground surface elevation of 8.4 feet NGVD) at gages 3A-3 and 3A-4. ALTQ reduced the number of times the threshold was exceeded relative to ECB19RR by six.

Historically, short hydroperiod wetlands have been important for wood stork foraging during the pre-breeding season with the storks shifting to longer hydroperiod wetlands as the dry season progresses. Hydrologic patterns that produce a maximum number of patches with high prey availability (*i.e.* high water levels at the end of the wet season and low water levels at the end of the dry season) are necessary for high reproductive outputs (Gawlik 2002, Gawlik et al. 2004). Implementation of CEPP South may produce a variety of wetland habitats that would support prey densities conducive to successful wading bird foraging and nesting. Sufficient foraging opportunities are anticipated to remain in other areas to offset any poor foraging conditions that may result from CEPP South. Furthermore, under CEPP South, approximately 1,003 acres would be managed to enhance flow by reconnecting historic sloughs. This would be accomplished with active vegetation management through use of herbicides (glyphosate) to remove sawgrass that has encroached historic sloughs. Application of herbicides may influence the density of submerged and emergent vegetation in these areas, influencing foraging suitability by allowing wood storks to move through the habitat and detect prey. Only a one time application of glyphosate is expected to occur. Potential effects to marsh fish may be minimal. Application of the herbicide is expected to reduce the sawgrass, creating a more open canopy to allow for periphyton growth. The treated area is expected to become more of a functioning slough in terms of movement of water across the landscape.

It should be noted, however, that with CEPP South, a levee will be constructed within WCA 3B that will result in the permanent loss of wood stork foraging habitat as well as habitat connectivity. Construction

of the Blue Shanty levee will result in the loss of approximately 113 acres of wetland habitat within WCA 3B. However, the construction of other project features, including the degradation of existing levees and the backfilling of canals will result in an increase of acres of wetland habitat within the action area; resulting in wetlands that may be suitable for foraging. Under CEPP South, approximately 4.0 miles of the east-west agricultural ditch would be backfilled in the Blue Shanty Flowway to improve southerly flow conveyance to the L-29 Canal (**FIGURE 3**) and may also be suitable for foraging. Approximately 1.37 miles are expected to be backfilled under Contract 1.

Hydrologic changes associated with implementation of the project are expected to alter and provide an overall net benefit for wood stork foraging suitability throughout the action area by improving foraging in Everglades National Park and Water Conservation Area 3B. Any, potential impacts to the wood stork as a result of operations will be minimized or avoided under CEPP South. The Corps will continue to evaluate how water management operations may be conducted to maximize beneficial effects for the wood stork. The Corps proposes specific minimization as part of CEPP South including species and habitat monitoring to identify population trends for the wood stork currently being conducted in compliance with the 2016 ERTP BO (USFWS 2016) and consistent with that proposed in the 2019 COP BA. Upon construction completion and operation of CEPP South features, the Corps will continue to implement PSC to provide real-time assessment of conditions in the study area to ensure wildlife recommendations are considered during the water management decision process. The Corps would implement construction conservation measures as outlined in the *Habitat Management Guidelines for the Wood Stork in the southeast Region* to minimize impacts resulting from construction of CEPP South features consistent with the commitment provided in the 2018 CEPP South BA.

The implementation of the Proposed Action is expected to influence wetland hydroperiods causing changes in foraging suitability for wood storks. Based upon the current information, the Corps' determination is that the Proposed Action may affect the wood stork and is thus requesting formal consultation under ESA for this species.

7 CUMULATIVE EFFECTS

Cumulative effects are those effects include the effects of future State or private activities, not involving Federal activities, which are reasonable certain to occur within the action area of the Federal action subject to consultation (50 C.F.E. 402.02). In this section, the Corps has included an even broader discussion on cumulative effects, including those effects that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. The following summarizes past, present, and projected Corps efforts that cumulatively affect the regional environment of south Florida **TABLE 7**. In addition, there are efforts underway by other Federal, State, and local agencies, as well as non-governmental organizations that are all working towards similar restoration goals. **TABLE 8** shows the net cumulative effects of the various resources which are directly or indirectly impacted. CEPP South is expected to contribute to a net beneficial cumulative impact on the regional ecosystem, providing benefits to WCA 3B and ENP by increasing flows.

It should be noted, that the Corps is finalizing ESA consultation with the USFWS concerning the project for ecosystem restoration, Central and Southern Florida, Everglades Agricultural Area, Florida. In section 1308(a) of the Water Resources Development Act (WRDA) of 2018, Congress authorized the Everglades Agricultural Area (EAA) ecosystem restoration project in accordance with section 601 of the WRDA of 2000, as recommended in the addendum to the Central Everglades Planning Project Post Authorization

Change Report (PACR), Feasibility Study and Draft Environmental Impact Statement prepared by the SFWMD and dated May 2018, with such modifications as the Secretary of the Army considers appropriate. This authorization modified the New Water implementation phase of CEPP. The Corps prepared a BA that identified potential effects on listed species pertaining only to the EAA ecosystem restoration project features that differ from CEPP; namely conversion of the CEPP A-2 FEB to a deep storage reservoir (A-2 Reservoir), and conversion of 3,000 acres of upland agricultural land to a STA (A2-STA). In section 1308(b) of WRDA 2018, Congress directed that the project may be constructed only after the Secretary of the Army prepares a report that addresses the concerns, recommendations, and conditions identified in the Assistant Secretary of the Army for Civil Works (ASA (CW)) Review Assessment of the CEPP PACR dated May 2018. The Corps is in the process of preparing a Final EIS and follow up report that address the Secretary's concerns, recommendations and conditions. The Final EIS is anticipated to be released for public and State and Agency review in late January 2020. Ultimately, the A-2 Reservoir and STA are expected to replace the A-2 FEB in CEPP New Water, providing 370,000 average annual acre-feet of water delivered south, an increase of 160,000 average annual acre-feet of water delivered south over the amount provided by CEPP as authorized in 2016. The additional water provided south will be modeled with the design of CEPP North and will require an update to the CEPP DPOM.

TABLE 7. PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS AND PLANS AFFECTING THE ACTION AREA

-	Past Actions and Authorized Plans	Current Actions and Operating Plans	Reasonably Foreseeable Future Actions and Plans
Status of Non-CERP Projects	- C&SF Project (1948) - ENP Protection and Expansion Act (1989) - MWD GDM and Final EIS (1992) - C-111 South Dade GRR (1994)	- SFWMD Restoration Strategies Project - MWD 8.5 SMA GRR (2000) - MWD Tamiami Trail Modifications Limited Reevaluation Report (2008) - C&SF C-51 West End Flood Control Project - Kissimmee River Restoration - Seepage Barrier near the L-31 N Levee (Miami-Dade Limestone Products Association) - Tamiami Trail Modifications Next Steps (TTMNS) Project, Phase 1 - SFWMD Florida Bay Initiatives - C-111 South Dade Project (Contracts 8, 8A, and 9)	- SFWMD Complete Restoration Strategies Project - MWD Closeout - Tamiami Trail Modifications Next Steps (TTMNS) Project, Phase 2
Operations Plan for Lake Okeechobee, WCA 3A, ENP and the SDCS	- Water Supply and Environment (WSE) Lake Okeechobee	- Lake Okeechobee Regulation Schedule (LORS 2008) - SFWMD LEC Regional Water Supply Plan	- LORS 2008 to be replaced by the Lake Okeechobee System Operating Manual by 2022 - SFWMD periodically revises the LEC Regional Water Supply Plan

	Regulation Schedule (2000) - IOP 2002 to 2012 ERTP	- ERTP October 2012 until replaced by COP; temporary planned deviations included Increment 1 and Increment 1.1 and 1.2 and 2 Operational Strategies - Herbert Hoover Dike Dam Safety Modification Study (HHD DSMS) risk reduction measures (2011 through 2022)	
CERP Projects		Congressional Authorization Received: - Broward County Water Preserve Areas Project - Caloosahatchee River (C-43) West Basin Storage Reservoir - Central Everglades Planning Project (CEPP), as modified by the project for ecosystem restoration, Central and Southern Florida, Everglades Agricultural Area, Florida Congressional Authorization Received and Construction in Progress: - Central Everglades Planning Projects (DOI removal of portions of Old Tamiami Trail roadway and SFWMD increased capacity of S-333N - Indian River Lagoon-South Project - Picayune Strand Restoration Project - Site 1 Impoundment Project - Biscayne Bay Coastal Wetlands Project Phase 1 - C-111 Spreader Canal Western Project (operated by SFWMD)	Future CERP Projects: - Lake Okeechobee Watershed Restoration Project - Western Everglades Restoration Project - Biscayne Bay Coastal Wetlands Phase 2 - C-111 Spreader Canal Project Phase 2

TABLE 8. SUMMARY OF CUMULATIVE EFFECTS

Hydrology	
Past Actions	Flood and water control projects have greatly altered the natural hydrology.

Present Actions	Federal and state agencies are coordinating on and implementing projects to improve hydrology.
Proposed Action	The specific features of the CEPP Recommended Plan to be implemented in CEPP South will include the construction of conveyance features that function to deliver and re-distribute existing water from WCA 3A to WCA 3B, ENP and Florida Bay. The combined flows to NESRS are anticipated to be more than what would have otherwise been discharged to ENP relative to current conditions. Hydroperiods within WCA 3B and NESRS are expected to improve.
Future Actions	Additional CERP projects propose to restore hydrology to more natural conditions.
Cumulative Effect	Although it is unlikely that natural hydrologic conditions would be fully restored to pre-drainage conditions, improved hydrology would occur with implementation of the Proposed Action. CERP is expected to improve the quantity, quality, timing and distribution of freshwater flow.
Threatened and Endangered Species	
Past Actions	Water management practices and urbanization have resulted in the degradation of existing habitat function and direct habitat loss leading to negative population trends of threatened and endangered species.
Present Actions	ERTP implementation represents a paradigm shift from single species to multi-species management. ERTP includes performance measures specifically directed at managing water levels and releases for the protection of multiple species and their habitats within the project area.
Proposed Action	Effects determinations for Federally threatened and endangered species within the project area are listed within **TABLE 3.** The Corps acknowledges the potential usage and occurrence of the previously discussed threatened and endangered species and/or critical habitat within the CEPP South action area. Species and habitat monitoring will continue to identify population trends for the CSSS, snail kite, wood stork and the vegetation characteristic of their habitats currently being conducted in compliance with the 2016 ERTP BO (USFWS 2016a) and consistent with that proposed in the 2019 COP BA. The Corps also commits to implementing construction conservation measures as appropriate.
Future Actions	Ongoing projects would be implemented to maintain threatened and endangered species within the project area. It is anticipated that suitable CSSS habitat will be maintained under future restoration initiatives, but it may not occur with the current or historic footprints in some areas.
Cumulative Effect	Habitat improvement, monitoring and management of threatened and endangered species are anticipated to allow populations to be maintained. Improvement of degraded populations is expected to be facilitated by the restoration and enhancement of suitable habitat through efforts to restore more natural hydrologic conditions within the project area.
Fish and Wildlife Resources	
Past Actions	Water management practices have resulted in aquatic vegetation community changes and a resultant disruption of aquatic productivity and function that has had repercussions through the food web, including effects on wading birds, large predatory fishes, reptiles and mammals.
Present Actions	Ongoing efforts have been made by Federal and state agencies to implement projects to improve hydrology within the project area to restore habitat conditions for fish and wildlife resources.
Proposed Action	Increases in forage prey availability (*i.e.* crayfish and other invertebrates, fish) resulting from improved hydroperiods would in turn provide beneficial effects for amphibian, reptile, small mammal, and wading bird species within WCA 3B and NESRS. Significant effects to fish and wildlife resources with Biscayne Bay and Florida Bay are not anticipated until the additional water (*i.e.* 370,000 acre-feet) identified by the is delivered, when CEPP New Water components are constructed.
Future Actions	Some level of improvement to fish and wildlife resources is expected to occur as a result of implementation of projects with the capability of improving the timing, quantity, quality and distribution of freshwater flow to the study area. Hydrologic restoration planned as part of CERP would further improve fish and wildlife habitat.
Cumulative Effect	Habitat improvement efforts are anticipated to benefit fish and wildlife resources.

Vegetation and Wetlands	
Past Actions	Drainage of Florida's interior wetlands, conversion of wetlands to agriculture, and urban development has reduced the spatial extent and quality of wetland resources.
Present Actions	Efforts are being taken by state and Federal regulatory agencies to reduce wetland losses.
Proposed Action	Improved hydroperiods and sheetflow within WCA 3B and NESRS would result in reduced soil oxidation, promoting peat accretion necessary to rebuild the complex mosaic of habitat across the landscape. Increased hydroperiods within the eastern marl prairies may act to alleviate some of the problems associated with drier conditions. There are some minor, short term, adverse effects due to construction of some CEPP South features, most notably the Blue Shanty Levee in WCA 3B. However, the construction of other features, including the degradation of levees and the backfilling of canals, reconnects and adds wetland acreage and provides the needed topography for sheetflow to restore the natural system. The WCA 3B flowway achieves a central goal of CERP and of CEPP; restoration of continuous sheetflow, over long distances, and in the original flow directionality. The Proposed Action may have a beneficial effect on vegetative communities within WCA 3B and NESRS.
Future Actions	Some level of improvement to vegetative communities is expected to occur as a result of implementation of projects with the capability of improving the timing, quantity, quality and distribution of freshwater flow to the study area. More natural hydrology as part of the CERP would assist in restoring natural plant communities.
Cumulative Effect	While the spatial extent of natural plant communities would not be restored to historic proportions, the quality of vegetative communities would be improved.
Water Quality	
Past Actions	Water quality has been degraded from urban, suburban, commercial, industrial, recreational and agricultural development.
Present Actions	Efforts to improve water quality from agricultural areas are ongoing. Construction of Federal and state projects can temporarily elevate localized levels of suspended solids and turbidity.
Proposed Action	Water quality conditions in the vicinity of the L-29 Canal and L-31N Canal may be affected by implementation of the Proposed Action.
Future Actions	Actions by the State of Florida's Restoration Strategies are expected to decrease nutrient concentrations and loadings to the project area. In general there is a slowly improving trend in water quality entering and exiting the upstream WCA's.
Cumulative Effect	While anthropogenic effects on water quality are unlikely to be eliminated, water quality is expected to slowly improve. This is based on trends indicated by data analysis and the fact that Best Management Practices (BMP's) are continuing to reduce nutrient loading to the system.

8 CONSERVATION MEASURES

Species and habitat monitoring will continue to identify population trends for the CSSS, snail kite, wood stork and the vegetation characteristic of their habitats currently being conducted in compliance with the 2016 ERTP BO (USFWS 2016a) and consistent with that proposed in the 2019 COP BA. PSC will allow the Corps and its Tribal and governmental partners to discuss ecological, hydrological, and meteorological conditions to achieve the objective of managing water levels and releases for the protection of multiple species and their habitats. Regularly scheduled interagency calls allow the Corps to gather input on desired long-term (annual and/or seasonal) conditions within WCA 3 and ENP. In addition, the PSC occur on an as needed basis with the frequency of the calls determined based upon ongoing or anticipated conditions within the WCAs, SDCS, and ENP. The PSC focus on the status of a suite of species to allow for adaptive management of the system based upon the needs of multiple species and their habitats. Upon construction completion and operation of CEPP South features, the Corps will continue to implement PSC

to provide real-time assessment of conditions within the action area to ensure wildlife recommendations are considered during the water management decision process.

The DPOM that will be developed for CEPP South will continue to adhere to elements of the 2016 ERTP RPA which mandate a seasonal closure period for S-12A, S-12B, S-343A, and S-343B from 01 October through 15 July with a high water strategy for WCA 3A which allows conditional operation of S-12A and S-12B during the months of October and November. However, consistent with the proposed COP, the CEPP South DPOM would include removal of the seasonal closures at S-344 and limited adjustments to the S-332D seasonal pump restrictions. Lifting of the S-344 closure dates and extending S-332D full pumping by an additional month, from November 30 to December 31, were based on coordination with the USFWS during development of the COP and will be carried forward into CEPP South.

The Corps will continue to evaluate how water management operations may be conducted to maximize beneficial effects for the CSSS. The Corps will continue to utilize best available methods to monitor and estimate the spatial and temporal extent of hydrologic conditions (water above or below ground surface) relative to the CSSS habitat targets (*i.e.* Dry Nesting Days and Discontinuous Hydroperiod) under CEPP South. The Corps will continue to implement provisions of the 2016 ERTP BO which require the Corps to provide a report to the USFWS on the results of this monitoring at least twice annually to evaluate progress toward meeting the performance targets (USFWS 2016) consistent with that proposed in the 2019 COP BA upon construction completion and operation of CEPP South features. Bi-annual reports will evaluate nesting season conditions and include information such as the operations that occurred and their effectiveness, and the spatial and temporal extent of hydrologic conditions within each CSSS subpopulation (USFWS 2016).

The specific features of the CEPP Recommended Plan to be implemented in CEPP South will include the construction of conveyance features that function to deliver and re-distribute existing water from WCA 3A to WCA 3B, ENP and Florida Bay. As mentioned in the 2018 CEPP South BA, the Corps would implement construction conservation measures as outlined in the *Habitat Management Guidelines for the Wood Stork in the southeast Region* (USFWS 2009), standard protection measures for the manatee, and *Draft Standard Protection Measures for the Eastern Indigo Snake* (USFWS 2004) to avoid and minimize adverse effects on those species during construction activities. The Florida bonneted bat may occur in the action area. Pre-construction surveys would be conducted prior to clearing and construction in order to identify any potential roost sites. Monitoring for listed species that could occur in or around the project area during construction would be specified in the contract specifications. The USFWS concurred with this approach in prior correspondence dated December 21, 2018.

9 CONCLUSIONS

The Corps acknowledges the potential usage and occurrence of the previously discussed threatened and endangered species and/or the potential occurrence of critical habitat within the CEPP South action area. Based on available information, it is evident that the Florida panther, the Florida manatee, Florida bonneted bat, CSSS, snail kite, wood stork, American alligator, American crocodile, Eastern indigo snake, Garber's spurge, Bartram's hairstreak butterfly, Florida leafwing butterfly, Everglades bully, Florida pineland crabgrass, Florida prairie clover, pineland sandmat, and Blodgett's silverbush, resides, travels, and or forages within the CEPP South action area and could be affected by implementation of CEPP South. Other federally threatened or endangered species that are known to exist or potentially exist within the CEPP South action area that are not affected by the implementation of CEPP South include the piping plover, red-cockaded woodpecker, roseate tern, Miami blue butterfly, Schaus swallowtail butterfly, Stock

Island tree snail, crenulate lead-plant, Okeechobee gourd, Big Pine partridge pea, Cape Sable thoroughwort, Carters small-flowered flax, Florida brickell-bush, Florida bristle fern, Florida semaphore cactus, and sand flax. The Corps has determined that implementation of CEPP South will have no effect on these species.

Within the Greater Everglades, altered hydrology has led to degradation of the native vegetation communities, such as tree islands, sawgrass marsh mosaic, and marl prairies, and the expansion of undesirable cattail monocultures. As habitats have been degraded, abundance and diversity of wildlife populations have been affected as well. Restoration of sheetflow and historic hydropatterns within WCA 3 and ENP will result in beneficial shifts toward more desirable vegetation communities, landscape patterns, and animal populations. Wood storks would benefit from increased freshwater sheetflow due to an increased foraging base in WCA 3B and ENP under CEPP South. Changes in the quality, quantity, timing, and distribution of water under CEPP South provides opportunities for improved vegetation in WCA 3B, and ENP, including expansion of sloughs and wet prairies, and contraction of sawgrass prairies, thus benefiting the Everglades snail kite. Conversion back to sloughs and wet prairies would provide improved apple snail ascension rates and meet apple snail depth recommendations which support successful apple snail oviposition, a key factor in snail kite survival. Implementation of CEPP South is expected to provide more water to SRS and the eastern marl prairies. Increased hydroperiods within the eastern marl prairies may act to alleviate some of the problems associated with drier conditions and promote a shift in species community composition; however over inundation on the flanks of SRS may shift marl prairie communities to wetter habitats. Areas within the western marl prairies between the boundary of BCNP and ENP are currently considered to be too wet. Increased flows to NESRS through CEPP South may act to alleviate those conditions currently experienced by CSSS-Ax.

As identified within Section 9 of the 2016 ERTP RPA, the USFWS recommended as a conservation recommendation, that the Corps continue to explore ways to increase the outlet capacity of WCA 3A and WCA 3B via the S-333 and S-355 structures, as authorized and envisioned as part of the MWD and CEPP projects to benefit listed species (USFWS 2016). The USFWS noted that improved capacity can be achieved by improving the S-355 and adding permanent pumps and/or by implementing the S-631, S-632, and S-633 structures proposed under CEPP to improve conditions for the CSSS and contribute towards the survival and recovery of the species. These conservation recommendations were proposed as a means to move water east and reduce the amount of water that currently flows over CSSS-A while still maintaining the eastern subpopulations (B-F). The movement of water towards the east into NESRS and further downstream into Taylor Slough was identified by the USFWS to not only provide benefits to CSSS-A but to also benefit drier parts of the eastern subpopulations and provide additional water to areas such as Florida Bay, which have experienced impacts from decreased freshwater flows. Consistent with conservation recommendations outlined with the 2016 ERTP BA, implementation and operation of CEPP South would address the need to move more water east; providing greater flow through the S-333 structure into NESRS within ENP thus benefiting the CSSS and addressing the 2016 ERTP Jeopardy Opinion. Furthermore, conservation actions are being taken by the Corps and others that are expected to improve habitat conditions for the CSSS in upcoming years. The Corps is proceeding with additional measures to further protect the CSSS which includes implementation of the COP by August 2020.

The Corps will continue discussions with the USFWS in the event of operational and or design modifications of CEPP South features if such modifications are proposed to occur in the future. The Corps will track implementation of CEPP South and communicate the status of all actions to the USFWS as appropriate through regular interagency discussions. ESA consultation will be reinitiated if appropriate under 50 CFR §402.16. For instance, if development of the CEPP South DPOM reveals effects of CEPP

South that may affect listed species or critical habitat in a manner or to an extent not considered in this 2020 CEPP South BA, the Corps will reinitiate ESA consultation as appropriate. This document is being submitted for formal consultation with the USFWS pursuant to Section 7 of the ESA.

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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
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JACKSONVILLE, FLORIDA 32207-8915

Planning and Policy Division
Environmental Branch

March 17, 2020

Mr. Larry Williams, Field Supervisor
U.S. Fish and Wildlife Service
1339 20th Street
Vero Beach, FL 32960

Dear Mr. Williams:

The Jacksonville District, U.S. Army Corps of Engineers (Corps) provided a Biological Assessment (BA) for the Central Everglades Planning Project (CEPP) South components (CEPP South) on January 23, 2020 to the U.S. Fish and Wildlife Service (USFWS) in accordance with provisions of Section 7 of the Endangered Species Act (ESA) of 1973, as amended. The Corps is providing this correspondence to amend the 2020 CEPP South BA based on coordination with the USFWS initiated on February 3, 2020, regarding the eastern black rail (*Laterallus jamaicensis jamaicensis*). The USFWS announced a 12 month petition finding on a petition to list the eastern black rail as threatened on October 9, 2018 (83 FR 50610) in the Federal Register. The eastern black rail has the potential to exist in the CEPP South study area based on its current range (Figure 1) and observation of the bird in Everglades National Park (ENP) (USFWS personnel communication).

The eastern black rail occupies portions of the eastern United States (east of the Rocky Mountains), Mexico, Central America, and the Caribbean (Figure 1). In the United States, eastern black rails are found in both coastal and interior areas, but the majority of detections are from coastal sites. Eastern black rails are found in a variety of salt, brackish, and freshwater marsh habitats that can be tidally or non-tidally influenced. Within these areas, the birds occupy relatively high elevations along heavily vegetated wetland gradients, with soils that are moist or flooded to a shallow depth (1 to 6 centimeters (cm)). Eastern black rails forage on a variety of small (< 1 cm) aquatic and terrestrial invertebrates, especially insects, and seeds. Occupied habitat tends to be primarily composed of fine-stemmed emergent plants (rushes, grasses, and sedges) with high stem and dense canopy cover. The eastern black rail requires dense vegetative cover that allows movement underneath the canopy, providing shelter and protection for nest sites. Flooding is a frequent cause of nest failure. Water levels must be below the nests during egg laying and incubation, which occurs from May to August, for nests to be successful.

CEPP South includes conveyance features that function to deliver and re-distribute existing water from Water Conservation Area (WCA) 3A to WCA 3B, and ENP. Due to increased water flow and changes in water distribution it is anticipated that currently over drained areas in ENP would be rehydrated. The eastern black rail uses the ecotone between emergent wetlands and upland grasslands as refugia during high water events cause by precipitation and tidal flooding. Eastern black rails require elevated refugia with dense cover to survive high water events due to the propensity of juvenile and adult black rails to walk and run rather than fly and due to the chick's inability to fly.

CEPP South is expected to benefit ENP by increasing flows to the area. As described throughout the 2020 CEPP South BA, the increase in stage and hydroperiods under CEPP South is unlikely to significantly affect higher elevations in ENP as operations of the CEPP South features are expected to be subject to current downstream constraints, consistent with ALTQ+ (Combined Operational Plan (COP) Preferred Plan) which include maintaining required water levels in the residential and agricultural areas in southeastern Miami-Dade County. The COP will define operations for water management infrastructure in the study area and serve as the baseline for initial water management operations in the CEPP South project area. The L-29 canal stage is anticipated to be limited to below that identified within the 2014 Final CEPP Project Implementation Report /Environmental Impact Statement which assumed a maximum operating limit of 9.7 feet, National Geodetic Vertical Datum of 1929 (NGVD). Based on this information, the Corps has determined that CEPP South may affect, but is not likely to adversely affect the eastern black rail. Reference the 2020 CEPP South BA for a description of expected differences in water depths and hydroperiods in WCA 3 and ENP. This determination is consistent with ESA correspondence to the USFWS on February 14, 2020 regarding effects determinations for the eastern black rail under the COP.

We request that the USFWS provide concurrence on the Corps species effect determinations and provide a Draft Biological Opinion (BO) within 90 days of the CEPP South BA provided on January 23, 2020, and provide a Final BO within 135 days from that date. If you have any questions or concerns please contact Ms. Melissa Nasuti by email Melissa.A.Nasuti@usace.army.mil or telephone 904-232-1368 regarding this consultation request.

Sincerely,

Angela E. Dunn
Chief, Environmental Branch

Enclosure

cc:
Mr. Donald Progulske, U.S. Fish and Wildlife Service, 1339 20th Street,
Vero Beach, FL 32960
Mr. Miles Meyer, U.S. Fish and Wildlife Service, 1339 20th Street,
Vero Beach, FL 32960
Mr. Kevin Palmer, U.S. Fish and Wildlife Service, 1339 20th Street,

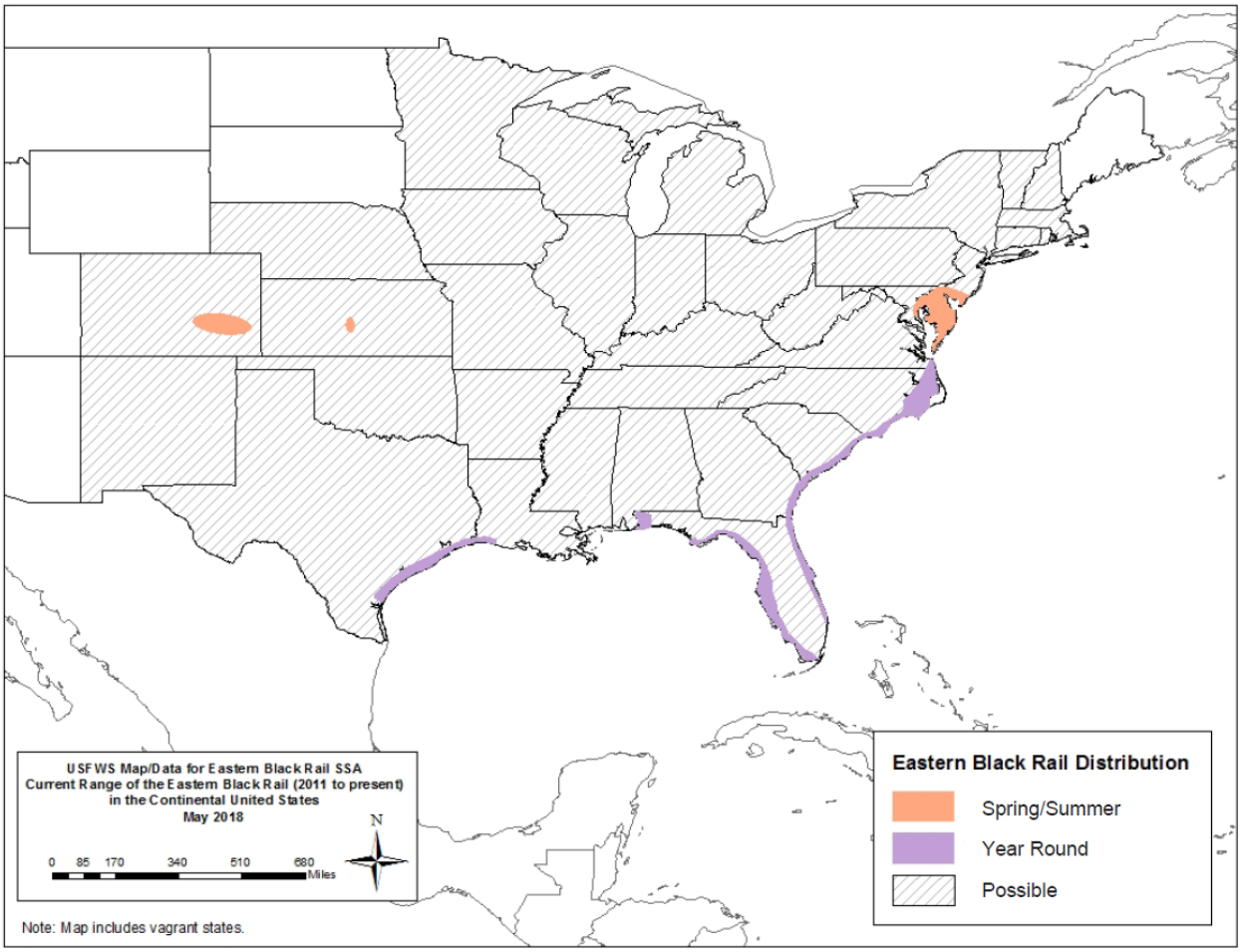

Figure 1. Current range of eastern black rail (Reference USFWS 2018. Species Status assessment report for the eastern black rail (*Laterallus jamaicensis jamaicensis*), Version 1.2. June 2018. Atlanta, GA.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960

April 14, 2020

Angela Dunn
Environmental Branch Chief,
Planning and Policy Division
U.S. Army Corps of Engineers
701 San Marco Blvd.
Jacksonville, Florida 32207

Service Consultation Code: 04EF2000-202020-F-0536
Date Received: January 23, 2020
Project: Central Everglades Planning Project South

Dear Ms. Dunn:

The U.S. Fish and Wildlife Service (Service) has reviewed the U.S. Army Corps of Engineers' (Corps) transmittal letter requesting to reinitiate consultation and the accompanying Biological Assessment (BA) dated January 23, 2020 for the Central Everglades Planning Project South components (CEPP South). The Service has also reviewed the Corps' amendment to the BA dated March 3, 2020, and all subsequent correspondence. This letter is submitted in accordance with section 7 of the Endangered Species Act of 1973 (ESA), as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.).*

General Comments

In the Transmittal Letter dated January 23, 2020, the Corps stated that "Completion of a revised Draft Project Operating Manual (DPOM) for CEPP South and supporting National Environmental Policy Act documentation is anticipated to be complete by July 2020. If the DPOM shows CEPP South will have effects to listed species or critical habitat in a manner or an extent not considered in the BA, the Corps will reinitiate ESA consultation as appropriate under 50 CFR §402.16." Consequently, the BA provides an analysis of the hydrologic impacts that operations of the CEPP South features will have under the Combined Operational Plan (COP) (Corps 2020). The Preferred Plan (ALT Q+) from the 2019 COP BA was referenced within the BA to determine species effects determinations on Federally listed threatened and endangered species as a result of CEPP South implementation (Corps 2019). The Corps uses modeling results for ALT Q to describe these affects throughout the BA. The Service is currently evaluating the COP impacts to listed species under a separate consultation and requests the Corps' affirmation that the CEPP South operations will be within the purview and operational constraints of COP. Therefore, any incidental take that occurs due to CEPP South operations will be covered under the COP BO Incidental Take Statement until such time that either 1) new

information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered under the COP and/or 2) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered under the COP. For clarity, we recommend that the Corps clearly state in the BA that COP is part of the proposed action for CEPP South.

The BA lists all the CEPP South features in Table 1 (page 8), Figure 2 (page 9), and provides a description of these on pages 11 through 14. The new S-356 pump station is not listed on Figure 2. Similarly, the S-355W gated spillway is not listed in Table 1. Please provide corrected versions of Figure 2 and table listing all CEPP South features.

The BA states that the increased capacity of S-333 and the removal of Old Tamiami Trail are currently being pursued and constructed by the South Florida Water Management District (SFWMD) and the Everglades National Park (ENP), respectively. The S-333N construction began on September 2018 and has been substantially completed. The removal of the Old Tamiami Trail construction began January 2020 with final construction completion by January 2022. It is unclear why these projects are being included as part of this consultation request since these projects have already began construction and been consulted upon under the CEPP Preliminary Biological Opinion (Service 2013a) and the Tamiami Trail Modifications: Next Steps Project (Service 2014; Service Consultation Code 41420-2010-F-0370) by the Corps and ENP, respectively. Therefore, these projects should be removed from the Project Description.

The BA provides a Table with the acres lost and the Habitat Impacts for CEPP South features and implementation of Adaptive Management and Monitoring Plan (AMMP) components but it does not include the acres or project footprints for the following components: S-333N, S-631, S-632, S-633, S-355W, and S-356. Table 4 on page 46 should be updated accordingly and the project footprint/dimensions for each component should be adequately described in pages 11 through 14.

The BA lists the operational constraints for CEPP South as defined by the COP on pages 17 and 18. The L-29 constraint of 8.5 ft for no longer than 90 days may be lifted after the Tamiami Trail Next Steps Final Phase is completed in 2023. Does the Corps plan on maintaining the L-29 constraint until a new operations plan is developed? Or, does the Corps plan on modifying operations and reinitiating consultation under CEPP South once construction is completed?

<u>Active Vegetation Management Comments</u>

According to the BA, the proposed action includes active vegetation management within a 1,003-acre area of the Blue Shanty Flowway to enhance flow by reconnecting historic sloughs. The BA states that the active vegetation management would be accomplished through the use of herbicides (glyphosate). The Service requests responses to questions 1-8 below, as this additional information is necessary so the potential effects from the active vegetation management on listed species can be thoroughly evaluated:

1.) How will the glyphosate be applied (i.e.; hand-sprayers, aerial applicators, airboats, etc.);

2.) What time of year will the glyphosate applications occur, and will there be multiple treatments;
3.) If there are multiple treatments, how many, and what timeframe will they occur;
4.) Will the glyphosate be formulated with additives such as surfactants or dyes;
5.) If there will be formulation to the glyphosate, provide a list of the additives;
6.) Will dead vegetation, resulting from the vegetation management, decompose in the water;
7.) If dead vegetation will be left to decompose, what effect will it have to water quality (i.e.; will it reduce dissolved oxygen);
8.) Will the treatment include the spraying of native vegetation or just invasive species?

Cape Sable Seaside Sparrow Comments

The Corps' transmittal letter requested formal consultation for the Cape Sable seaside sparrow and made a determination of "May Affect" but did not specify whether the species/critical habitat is "not likely to be adversely affected" or "likely to be adversely affected." When the Federal action agency determines that a "*May affect, and Likely to Adversely Affect*" situation exists, the action agency is required to request formal consultation with the Service for those species.

The Corps' BA states on page 64 that, "The western marl prairies, where CSSS-A resides may experience a backwater effect due to increased flows in NESRS; however, this potential effect may be ameliorated by removal of the L-67 Extension Levee under CEPP South." There is no further analysis or explanation of how this may occur. The Service is concerned that operation of COP through the CEPP South infrastructure plan (e.g., removal of the L-67 extension levee) will change the flow volumes and patterns below the 2.6-mile bridge. Does modeling address this issue? The BA states in one location that the L-67 extension will not be backfilled (page 8, Table 1) and in another it states that it will (page 12, 6th bullet). Which is the case?

The Corps concludes the sparrow section in part with, "CEPP South may potentially raise groundwater levels in sensitive areas for the sparrow, therefore, hydrological changes associated with implementation of the action are expected to alter some of the physical and biological features essential to the nesting success and overall conservation of the subspecies. The implementation of the Proposed Action is expected to influence wetland hydroperiods causing changes in nesting and marl prairie suitability for the CSSS." It is not clear whether these hydrologic changes are a result of the construction of the CEPP South features or a result of the COP operations that will be in place. If these hydrologic changes are a result of the COP, then they should be addressed in the current COP Biological Opinion. If they are a result of the CEPP South features, then additional information will be required to determine their effect on the CSSS.

Our preliminary review of the Corps' proposed action, construction of the CEPP South features, indicates that a determination of *"May affect, is not likely to adversely affect*" may be appropriate for the sparrow based on its distance (approximately 9 miles)from the proposed footprint of the project. The Corps has assured the Service that any interim operations under

CEPP would be strictly controlled to match those under COP and therefore any incidental take of CSSS would be pursuant to the ITS in the Service's 2020 COP Biological Opinion.

Everglade Snail Kite Comments

The Corps' transmittal letter requested formal consultation for the Everglade snail kite and made a determination of "May Affect" but did not specify whether the species/critical habitat is "not likely to be adversely affected" or "likely to be adversely affected." When the Federal action agency determines that a "*May affect, and Likely to Adversely Affect*" situation exists, the action agency is required to request formal consultation with the Service for those species.

The BA does not identify conservation measures for the Everglade snail kite that will be implemented as part of the action to minimize potential adverse effects to the species. The Service requests for the Corps to consider incorporating the Service's *Standard Snail Kite Management Guidelines*. These guidelines recommend maintaining a 150-meter no-entry zone and a 500-meter limited activity zone around all active snail kite nests within the action area. The commitment to this conservation measure may support a "*May affect, is not likely to adversely affect*" determination for the Everglade snail kite.

Wood Stork Comments

The Corps' transmittal letter requested formal consultation for the wood stork and made a determination of "May Affect" but did not specify whether the species is "not likely to be adversely affected" or "likely to be adversely affected." When the Federal action agency determines that a "*May affect, and Likely to Adversely Affect*" situation exists, the action agency is required to request formal consultation with the Service for those species.

The Service requires an analysis of foraging prey base losses and enhancements for projects with greater than 2.02 hectares (5 acres) of wetland impacts (Service 2010). The BA does not include a foraging analysis to evaluate the impacts from the construction of the CEPP South components and the active vegetation management activity. The Service requested this information by email on March 3, 2020 and March 17, 2020, respectively. The Corps provided the hydroperiod class information needed for this analysis by email on April 2, 2020. The Service will evaluate the Project effects to foraging prey base and foraging habitat based on this information.

The Corps stated that it will implement construction conservation measures as outlined in the Service's *Habitat Management Guidelines for the Wood Stork in the Southeast Region* (Service 1990). These guidelines recommend maintaining a 229-meter (750 ft) protection zone around feeding sites when storks are present, 457-meter (1,500 ft) primary zone and a 762-meter (2,500 ft) secondary zone around all active wood stork nests within the action area. The commitment to this conservation measure may support a "*May affect, is not likely to adversely affect*" determination for the wood stork.

Eastern Indigo Snake Comments

The Corps made a determination of "*May affect, but is not likely to adversely affect*" the eastern indigo snake in the BA. The Service is developing a revised consultation Key for the eastern indigo snake. While the Key is being developed, based on guidance in a November 22, 2019, email from the State Supervisor (subject: Approved distances for consultations involving indigo snakes) the Service has identified an interim approach on when we would recommend consultation under the Act on eastern indigo snakes based on the expectation that an individual may be present.

In accordance with this guidance, the South Florida Ecological Services Field Office buffered known eastern indigo snake occurrence locations with a radius of 0.62 miles. It was determined that there is an indigo snake occurrence within the proposed S-356 Pump Station replacement project. The BA should provide an analysis of the construction impacts associated with the S-356 Pump Replacement project including the construction footprint, time of year, and duration that construction activities will occur. The BA should also include a description of where equipment and materials will be staged and how much material will be excavated from the area and how this material will be disposed. This information is needed to document the Corps' conclusions and the rationale to support the conclusion regarding the effects of their proposed actions on the eastern indigo snake. The Corps commits to avoiding and minimizing adverse effects during construction activities as outlined in the *Draft Standard Protection Measures for the Eastern Indigo Snake* (Service 2013b). The commitment to this conservation measure may reduce any potential adverse affects to the eastern indigo snake.

Pine Rockland Species Comments

The BA has a "May affect, but is not likely to adversely affect" determination for the following species and their critical habitats: Bartram's Hairstreak Butterfly, Florida Leafwing Butterfly and their Critical Habitats; Blodgett's Silverbush, Deltoid Spurge, Everglades Bully, Florida Pineland Crabgrass, Florida Prairie Clover, Garber's Spurge, Pineland Sandmat, Small's Milkpea, and Tiny Polygala. The Service believes that a "No effect" determination may be appropriate for these species and critical habitats because they are not present in the action area of CEPP South, which includes the construction footprint of the features and the area that will be affected by the associated active vegetation management. These species are within the action area of the COP which is currently being evaluated under a separate consultation. All operations of CEPP South features will be in accordance with the COP that is expected to begin implementation in August 2020. Therefore, no additional effects are anticipated for these species as a result of CEPP South.

Thank you for your cooperation and effort in protecting federally listed species. If you have any questions regarding this correspondence, please contact James Gruhala at 772-469-4250.

Sincerely,

Donald Progulske
Everglades Program Supervisor
South Florida Ecological Services Office

cc: electronic only
Corps, Jacksonville (Angela Dunn, Andrew LoSchiavo, Melissa Nasuti)

LITERATURE CITED

U.S. Army Corps of Engineers (Corps). 2019. Combined Operational Plan Biological Assessment. Jacksonville District, Jacksonville, Florida, USA.

U.S. Army Corps of Engineers. 2020. Endangered Species Act Biological Assessment for the Central Everglades Planning Project. Jacksonville District. Jacksonville, Florida. January 2020.

U.S. Fish and Wildlife Service (Service). 1990. Habitat management guidelines for the wood stork in the southeast region. Prepared by John C. Ogden for the Southeast Region U.S. Fish and Wildlife Service; Atlanta, Georgia.

U.S. Fish and Wildlife Service. 2010. South Florida Programmatic Concurrence. South Florida Ecological Services Office; Vero Beach, Florida.

U.S. Fish and Wildlife Service. 2013a. Preliminary Biological Opinion and Select Concurrence for the Central Everglades Planning Project on Effects to Threatened or Endangered Species and Critical Habitat. Vero Beach, Florida. December 17, 2013.

U.S. Fish and Wildlife Service. 2013b. Standard Protection Measures for the Eastern Indigo Snake.https://www.fws.gov/northflorida/IndigoSnakes/20130812_EIS%20Standard%20Protection%20Measures_final.pdf. August 12, 2013.

U.S. Fish and Wildlife Service. 2014. Amended biological opinion on the Tamiami Trail Modifications: Next Steps Project, Phase 1, Incorporating Modifications to the Authorized Plan. Vero Beach, Florida. July 8, 2014.

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO LORIDAOULEVARD
JACKSONVILLE, FLORIDA 32207-8175

Planning and Policy Division
Environmental Branch

8 May 2020

Mr. Larry Williams, Field Supervisor
U.S. Fish and Wildlife Service
1339 20th Street
Vero Beach, FL 32960

Dear Mr. Williams:

The Jacksonville District, U.S. Army Corps of Engineers (Corps), provided a Biological Assessment (BA) for the Central Everglades Planning Project (CEPP) South components on January 23, 2020 to the U.S. Fish and Wildlife Service (USFWS) in accordance with provisions of Section 7 of the Endangered Species Act (ESA) of 1973, as amended. The Corps is providing this correspondence to amend the 2020 CEPP South BA based on receipt of a request for additional information from the USFWS dated April 14, 2020. Detailed responses to the requested information are attached to this letter.

We request that the USFWS provide concurrence on the Corps revised species effect determinations, as outlined in the attached, upon receipt of this letter. The Corps is further requesting, that any concurrence letter provided in response to the revised "may affect not likely to adversely affect" determinations for the Cape Sable Seaside Sparrow (*Ammodramus maritimus mirabilis*) and its designated critical habitat, the Everglade snail kite (*Rostrhamus sociabilis plumbeus*) and its designated critical habitat, and the wood stork (*Mycteria americana*), clearly state that the construction of CEPP South features and interim operations of the CEPP South features in Contract 1 (S-631, S-632, and S-633), which will also be described in the 2020 CEPP South Draft Project Operating Manual, is not anticipated to exceed the take defined in the 2020 COP Biological Opinion (BO). Interim operations under CEPP South are consistent with COP operations. Therefore, any incidental take that occurs due to these operations has already been addressed in the COP consultation and that take is covered under the COP BO Incidental Take Statement. If under interim operations for CEPP South, incidental take for the COP is exceeded, re-initiation of consultation under the COP would be anticipated.

As previously communicated, the Corps plans to proceed with advertisement and award of the first construction contract for CEPP South in July and September 2020, respectively. Incidental take was not provided in the 2014 CEPP Programmatic BO for

the CSSS, Everglade snail kite, and wood stork. ESA consultation is required to be complete for CEPP South for purposes of execution of the PPA. The Corps is requesting that the concurrence letter prepared by the USFWS for the revised determinations, note that the letter also serves to update ESA consultation for CEPP South components previously evaluated in the 2014 CEPP Programmatic BO.

Please contact Melissa Nasuti by email: Melissa.A.Nasuti@usace.army.mil or telephone 904-232-1368 regarding this consultation request.

Sincerely,

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Date: 2020.05.08 09:30:41 -04'00'

Angela E. Dunn
Chief, Environmental Branch

Encl

cc:

Mr. Donald Progulske, U.S. Fish and Wildlife Service, 1339 20th Street, Vero Beach, Florida 32960
Mr. Miles Meyer, U.S. Fish and Wildlife Service, 1339 20th Street, Vero Beach, Florida 32960

Attachment 1

General Comments from April 14, 2020 Correspondence from USFWS

USFWS Comment: In the Transmittal Letter dated January 23, 2020, the Corps stated that "Completion of a revised Draft Project Operating Manual (DPOM) for CEPP South and supporting National Environmental Policy Act documentation is anticipated to be complete by July 2020. If the DPOM shows CEPP South will have effects to listed species or critical habitat in a manner or an extent not considered in the BA, the Corps will reinitiate ESA consultation as appropriate under 50 CFR §402.16." Consequently, the BA provides an analysis of the hydrologic impacts that operations of the CEPP South features will have under the Combined Operational Plan (COP) (Corps 2020). The Preferred Plan (ALT Q+) from the 2019 COP BA was referenced within the BA to determine species effects determinations on Federally listed threatened and endangered species as a result of CEPP South implementation (Corps 2019). The Corps uses modeling results for ALT Q to describe these affects throughout the BA. The Service is currently evaluating the COP impacts to listed species under a separate consultation and requests the Corps' affirmation that the CEPP South operations will be within the purview and operational constraints of COP. Therefore, any incidental take that occurs due to CEPP South operations will be covered under the COP BO Incidental Take Statement until such time that either 1) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered under the COP and/or 2) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered under the COP.

Response: The Corps reaffirms that the COP will define operations for water management infrastructure in the study area and will serve as the baseline for initial water management operations of features associated with the first construction contract, CEPP South Contract 1. Components in CEPP South Contract 1 include: (1) the L-67A gated culverts (S-631, S-632, S-633); (2) the L-67C interim 3,000 foot levee gap south of S-633; (3) L-67A spoil pile removal; and (4) backfill of a portion of the east-west agricultural ditch with degrade of the adjacent spoil piles between L-67A and L-67C.

CEPP South infrastructure (S-631, S-632, and S-633) will be operated subject to the constraints identified under the COP, and in the same manner as prescribed for the S-152 structure under the DPM Phase 2 Field Test, as part of interim operations that will be included in the 2020 CEPP DPOM. S-152 releases up to the design capacity of 750 cfs from WCA 3A to WCA 3B under the following restrictions:

- L-67A canal stage at S-333 HW must be above 7.5 feet NGVD.
- Closed when WCA 3B at Site 71 or SRS-1 stage equals or exceeds 8.5 feet, NGVD.
- The water quality constraint criteria per FDEP Permit Number 0304879 (or any subsequent modifications issued to USACE) must be met.
- S-152 may be closed when S-355A and S-355B are closed due to L-29 canal stage constraints.

S-631, S-632, S-633, and S-152 would collectively only be able to pass the equivalent volume currently allowed by the design capacity of S-152 which is 750 cfs. Reference Section 4.1 (Pg 18) of the 2020 CEPP South BA. The above mentioned permit and subsequent modifications were provided to USFWS on April 30, 2020 via email.

USFWS Comment: The BA lists all the CEPP South features in Table 1 (page 8), Figure 2 (page 9), and provides a description of these on pages 11 through 14. The new S-356 pump station is not listed on Figure 2. Similarly, the S-355W gated spillway is not listed in Table 1. Please provide corrected versions of Figure 2 and table listing all CEPP South features.

Response: Table 1 in the 2020 CEPP South BA references a "L-29 Gated Spillway". The term "S-355W gated spillway" is another way to refer to the "L-29 Gated Spillway". Table 1 has been updated below. Figure 2 in the 2020 CEPP South BA shows the location of S-356 noted as a "Yellow Line Feature". This figure was pulled from the 2014 CEPP Final PIR/EIS, in which the authorized project features were graphically represented by: (1) North of the Redline (Storage and Treatment); (2) South of the Redline (Distribution and Conveyance); (3) Blue and Green Lines (Distribution and Conveyance) and; (4) Yellow Line (Seepage Management). S-356 is represented as feature number "1" in Figure 1 below. Please use this figure, in addition to that already included in the 2020 CEPP South BA for purposes of clarifying the location of S-356.

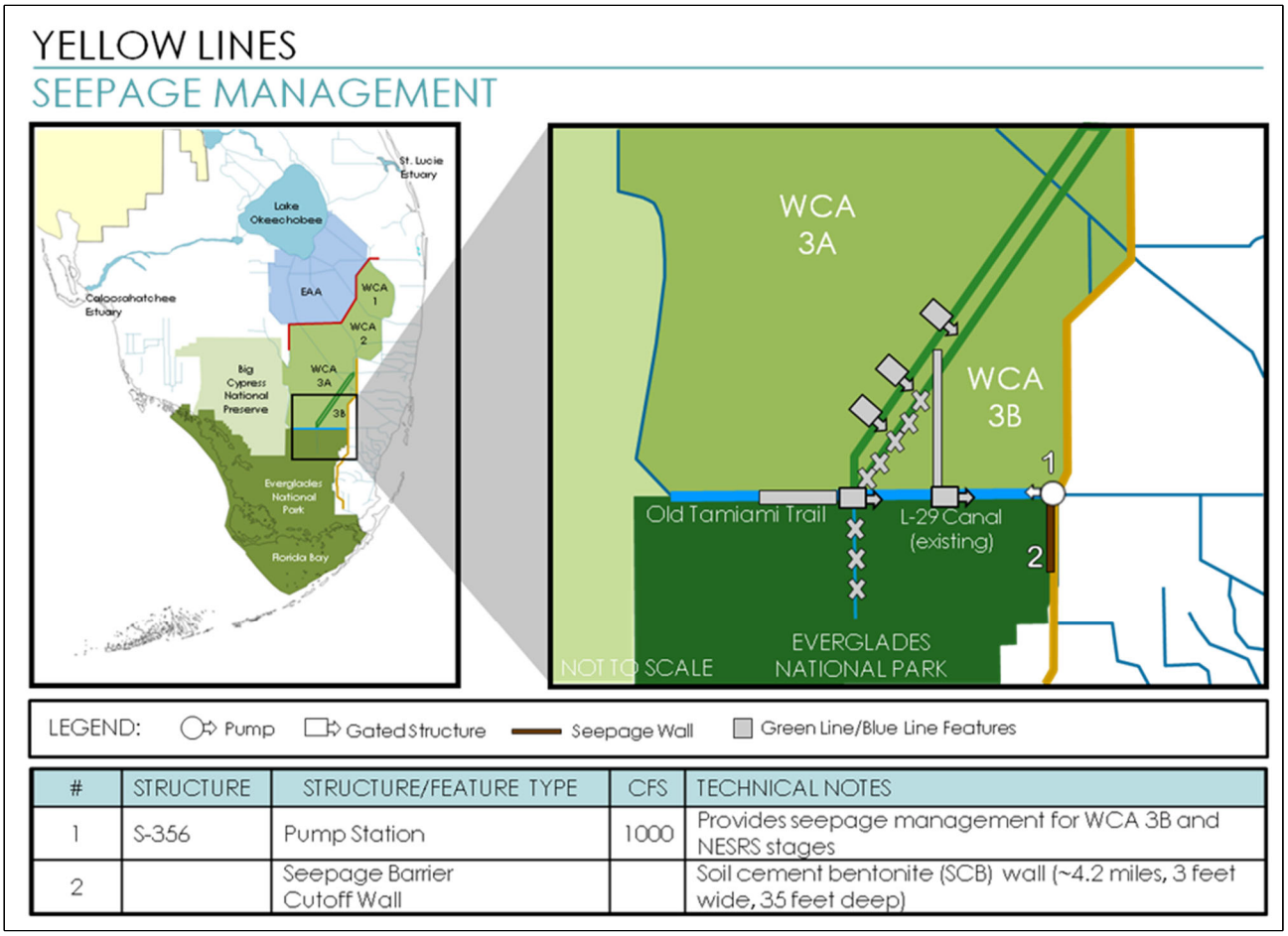
REVISED TABLE 1 FROM 2020 CEPP SOUTH BA. CEPP PROJECT FEATURES BY IMPLEMENTATION PHASE.

CEPP North	• L-6 Diversion
	• S-8 Pump Modifications
	• L-4 Levee Degrade and Pump Station
	• L-5 Canal Improvements
	• Miami Canal Backfill
CEPP South	• L-67 A Structure North
	• One L-67 C Gap (6,000 ft.)
	• Increase S-356 to 1,000 cfs
	• Increase S-333*
	• L-29 Gated Spillway (S-355W Gated Spillway)
	• L-67 A Structures 2 and 3 South
	• L-67 A Spoil Mound Removal
	• Remove L-67 C Levee Segment
	• Remove L-67 Extension Levee
	• 8.5 Mile Blue Shanty Levee
	• Remove L-29 Levee Segment
	• Backfill L-67 Canal Extension
	• Remove Old Tamiami Trail**
	• Seepage Barrier L-31 N

CEPP New Water	• A-2 Reservoir
	• Miami Canal and North New River Canal Improvements

* Action currently being pursued by the South Florida Water Management District (SFWMD)

** Action currently being pursued by the National Park Service (NPS)



#	STRUCTURE	STRUCTURE/FEATURE TYPE	CFS	TECHNICAL NOTES
1	S-356	Pump Station	1000	Provides seepage management for WCA 3B and NESRS stages
2		Seepage Barrier Cutoff Wall		Soil cement bentonite (SCB) wall (~4.2 miles, 3 feet wide, 35 feet deep)

FIGURE 1. CEPP RECOMMENDED PLAN SEEPAGE MANAGEMENT FEATURES AND LOCATIONS. NOTE LOCATION OF S-356.

USFWS Comment: The BA states that the increased capacity of S-333 and the removal of Old Tamiami Trail are currently being pursued and constructed by the South Florida Water Management District (SFWMD) and the Everglades National Park (ENP), respectively. The S-333N construction began on September 2018 and has since been completed. The removal of the Old Tamiami Trail construction began January 2020 with final construction completion by January 2022. It is unclear why these projects are being

included as part of this consultation request since these projects have already began construction and been consulted upon under the CEPP Preliminary Biological Opinion (Service 2013a) and the Tamiami Trail Modifications: Next Steps Project (Service 2014; Service Consultation Code 41420-2010-F-0370) by the Corps and ENP, respectively. Therefore, these projects should be removed from the Project Description.

Response: Information on the status of S-333N and removal of Old Tamiami Trail, were included in the project description to provide an update to the USFWS on the status of these components. These features are part of the environmental baseline for this consultation and their respective feature effects to listed species were evaluated under the BOs referenced by the Service in the RAI. S-333N is not included in Table 4 of the 2020 CEPP South BA. As noted in the provided correspondence, the construction of this structure is being pursued by the SFWMD. Updated ESA consultation (from the 2014 Programmatic BO) with respect to the structure was completed by the Corps' Regulatory Division prior to issuance of the associated permit to the SFWMD. Reference Department of Army Permit SAJ-2018-00736 and FDEP CERPA Permit 0362076-001. Reference to Old Tamiami Trail Road Degrade was included in Table 4 of the 2020 CEPP South BA, as it originally appeared in the 2014 CEPP BA; however the Corps proposes to remove reference to this feature in the table because the feature has already been subject to ESA consultation and construction is pending completion. Updated ESA consultation for this structure occurred through coordination with ENP for the Tamiami Trail Modifications: Next Steps Project (Service 2014; Service Consultation Code 41420-2010-F-0370).

USFWS Comment: The BA provides a Table with the acres lost and the Habitat Impacts for CEPP South features and implementation of Adaptive Management and Monitoring Plan (AMMP) components but it does not include the acres or project footprints for the following components: S-333N, S-631, S-632, S-633, S-355W, and S-356. Table 4 on page 46 should be updated accordingly and the project footprint/dimensions for each component should be adequately described in pages 11 through 14.

Response: Table 4 of the 2020 CEPP South BA has been updated, based on the current available information for S-631, S-632, S-633, L-67A spoil pile removal, S-356, S-355W, backfill of the east-west agricultural ditch, and installation of the temporary pumps adjacent to the L-29 canal.

S-631, S-632, and S-633 will largely be constructed within the footprint of the existing levee. Based on the current limits of construction, construction of S-631, S-632, and S-633 is expected to result in wetland impacts of 2.0, 2.5, and 3.0 acres, respectively.

The 2014 CEPP Final PIR/EIS identified that spoil piles along the northwestern side of the of the L-67A canal in the proximity of the L-67A gated culverts would be removed to facilitate sheetflow connectivity with the WCA 3A marsh. The location and number of spoil piles to be removed were not previously identified in the 2014 CEPP Final PIR/EIS. The Corps has since identified the location and number based on coordination with the SFWMD, FDEP, and FWC. Based on the current limits of construction, spoil pile removal at S-631 and S-632 is expected to result in temporary wetland impacts of 6.8 and 7.6

acres, respectively. Vegetation within the footprint of construction would be expected to re-vegetate.

Estimated acreages of wetland impacts in Table 4 have also been revised to account for the backfill of the east-west agricultural ditch and the installation of the L-29 canal temporary pumps, as these features were not explicitly described in the 2014 Final PIR/EIS. Approximately 81 acres of wetlands would be temporarily impacted under backfill of the approximate 4.0 mile east-west agricultural ditch located between L-67C canal and the Blue Shanty levee. CEPP South Contract 1 proposes to backfill only a portion of the east-west agricultural ditch (1.36 miles) which would result in temporary wetland impacts of 28 acres. Vegetation within the footprint of construction would be expected to re-vegetate.

Installation of the L-29 temporary pumps would result in temporary wetland impacts of 0.065 acres from the construction of collection sumps that would need to be installed immediately adjacent and north of the L-29 levee. When the pumps are removed in advance of the L-29 levee segment removal under CEPP South Contract 5, the sump excavations would be returned to the pre-installation condition. It is anticipated that only two temporary pumps would be installed adjacent to the L-29 canal; however in coordination with the SFWMD, FDEP, and FWC, three potential locations were identified, as listed in Table 4.

S-356 and S-355W are in the preliminary design phase. Contract award for S-356 is expected in September of 2022 with the duration of the construction estimated to be four years beyond contact award per the south Florida IDS. Contract award for S-355W is expected in June 2023 with the duration of construction estimated to be two years beyond contract award per the south Florida IDS. Finalized footprints, including where equipment and materials will be staged for S-356 and S-355W are currently under development. Quantities of how much material will be excavated for each structure, as well as how the material will be disposed of is also under development. Estimated wetland acreages associated with the construction and installation of S-355W and S-356 have been added to Table 4 below at the request of the USFWS. These acreages represent best available information that is subject to change due to further detailed design during the PED phase.

Figure 2 shows preliminary design efforts for S-356. The blue polygon represents the pump station footprint. The northern brown polygon represents a parking area, the location of a fuel tank farm, pump station access ramp, and loading dock area. The purple polygon represents the spillway footprint. The southern brown polygon will be infill and will also provide a loading dock area. All areas between the green lines are expected to be open water. The pink line represents the re-aligned levee. The area between the pink line and the existing L-29 canal (~ 6 acres) is expected to be the maximum extent of potential wetland impacts. The approximate acreage between the green lines that is expected to become open water is 3.7 acres, of which 3.2 acres are existing levee. The approximate acreage of open water that is expected to be filled is 0.6 acres. The structure to the left of the polygons is S-334.

Figures 3 and 4 show preliminary design efforts for S-355W including the location and potential staging. The structure is anticipated to be aligned with the L-67D levee. A conceptual bypass canal and cofferdam to facilitate construction is shown in Figure 4, however the design and/or need for these features is not yet determined. The Corps is also currently investigating the option to install temporary pumps to bypass water around the immediate construction footprint of S-355W during construction. The approximate acreage of wetlands to be temporarily disturbed with construction of a cofferdam is 1.44 acres. The approximate acreage of existing levee that will temporarily convert to open water as a result of the bypass canal is 1.09 acres. The approximate acreage of water expected to convert to the structure to include staging during construction is 1.05 acres.

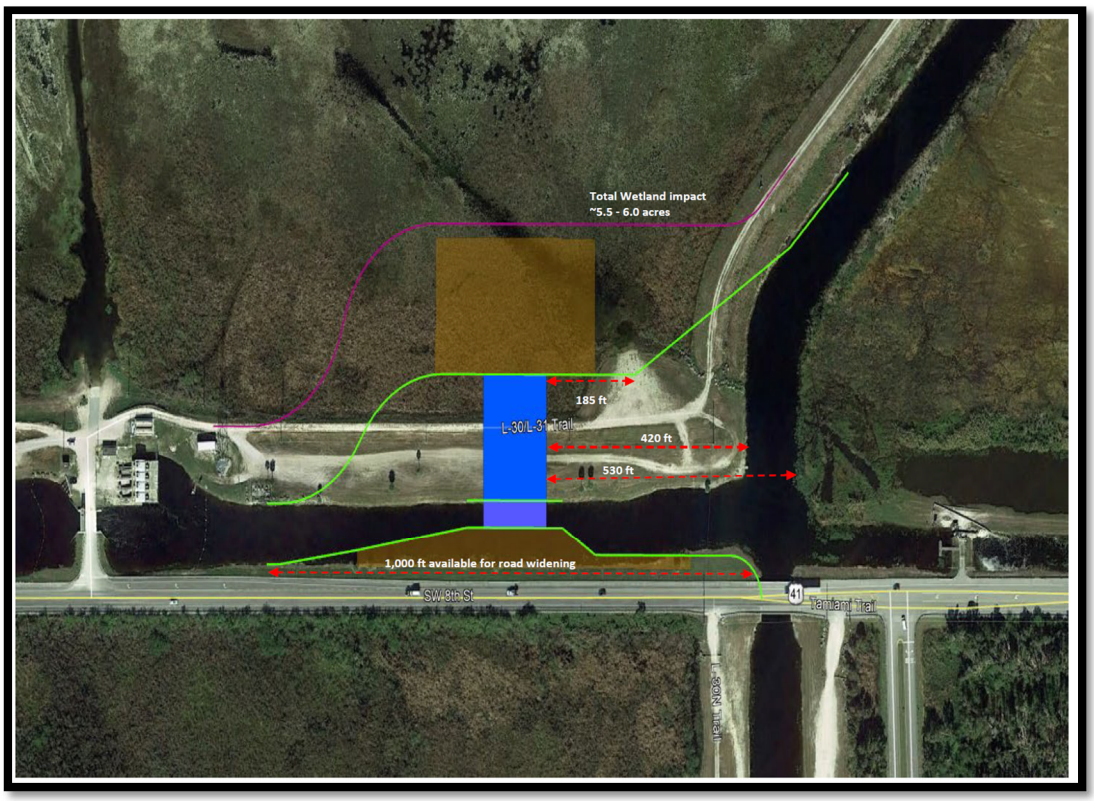


FIGURE 2. PRELIMINARY DESIGN AND LOCATION OF PROPOSED S-356.

FIGURE 3. PRELIMINARY DESIGN AND LOCATION OF PROPOSED S-355W SPILLWAY.

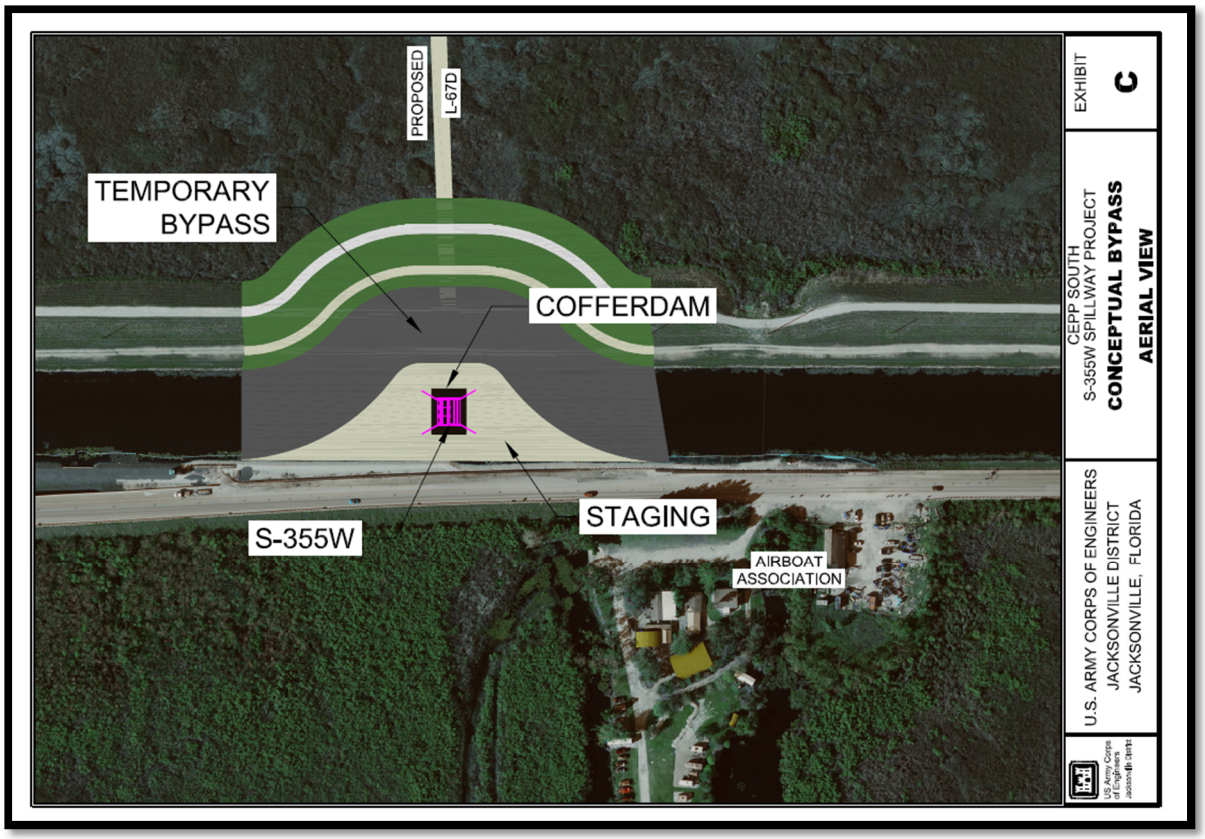


FIGURE 4. PRELIMINARY DESIGN AND LOCATION OF PROPOSED S-355W SPILLWAY TO INCLUDE POTENTIAL BYPASS CANAL AND STAGING LOCATION.

REVISED TABLE 4 FROM 2020 CEPP SOUTH BA. PANTHER HABITAT IMPACTS FOR CEPP SOUTH FEATURES BASED ON PANTHER HABITAT UNIT VALUES* INCLUDING IMPLEMENTATION OF AMMP COMPONENTS

Project Feature	Zone of Impacted Lands	Acres Lost	Panther Habitat Unit Value	Total HUs	Acres Created	Panther Habitat Unit Value	Total HUs
L-67C Gap Degrade (barren/disturbed to marsh)	Primary	9	3	27	9	4.7	42
L-67C Flowway Degrade[1] (barren/disturbed to marsh)	Primary	64	3	192	64	4.7	301

Project Feature	Zone of Impacted Lands	Acres Lost	Panther Habitat Unit Value	Total HUs	Acres Created	Panther Habitat Unit Value	Total HUs
L-29 Degrade (barren/disturbed to marsh)	Primary	46	3	138	46	4.7	216
Blue Shanty Levee Creation (marsh to barren/disturbed)	Primary	113	4.7	531	113	3	339
L-67 Extension Levee Degrade (barren/disturbed to marsh)	Primary	41	3	123	41	4.7	193
L-67 Extension Backfill (water to marsh)	Primary	104	0	0	104	4.7	489
East-West Agricultural Ditch Backfill 4 Miles (water to marsh)[2]	Primary	81	0	0	81	4.7	381
S-631[3] (marsh to barren disturbed)	Primary	2	4.7	9	2	3	6
S-631 Spoil Piles (barren/disturbed to marsh)	Primary	6.8	3	20	6.8	4.7	32
S-632[3] (marsh to barren disturbed)	Primary	2.5	4.7	12	2.5	3	8
S-632 Spoil Piles (barren/disturbed to marsh)	Primary	7.6	3	23	7.6	4.7	36
S-632-AMI-P2 Temporary Pump (marsh to barren disturbed)	Primary	0.023	4.7	0	0.023	3	0
S-633[3] (marsh to barren disturbed)	Primary	3	4.7	14	3	3	9
S-633-AMI-P2 Temporary Pump (marsh to barren disturbed)	Primary	0.023	4.7	0	0.023	3	0

Project Feature	Zone of Impacted Lands	Acres Lost	Panther Habitat Unit Value	Total HUs	Acres Created	Panther Habitat Unit Value	Total HUs
S-152-AMI-P2 Temporary Pump (marsh to barren disturbed)	Primary	0.023	4.7	0	0.023	3	0
S-356 (marsh to barren disturbed)	Primary	6	3	18	6	4.7	28
S-356 (barren disturbed to open water)	Primary	0.5	3	2	0.5	0	0
S-356 (open water to barren disturbed)	Primary	0.6	0	0	0.6	3	2
S-355W (marsh to barren disturbed)	Primary	1.44	4.7	7	1.44	3	4
S-355W (barren disturbed to open water)	Primary	1.09	3	3	1.09	0	0
S-355W (open water to barren disturbed)	Primary	1.05	0	0	1.05	3	3
Total	-	-	-	1,119	-	-	2,088

[1] Estimated wetland acreage from CEPP South Contract 1 (L-67C 3,000 foot interim gap) = 2.4 acres.

[2] Estimated wetland acreage from CEPP South Contract 1 (East-West Agricultural Ditch Backfill 1.36 miles) = 28 acres

[3] Estimated wetland acreage from the 2014 CEPP Final PIR/EIS for the L-67A Gated Culverts = 13.5 acres

USFWS Comment: The BA lists the operational constraints for CEPP South as defined by the COP on pages 17 and 18. The L-29 constraint of 8.5 ft for no longer than 90 days may be lifted after the Tamiami Trail Next Steps Final Phase is completed in 2023. Does the Corps plan on maintaining the L-29 constraint until a new operations plan is developed? Or, does the Corps plan on modifying operations and reinitiating consultation under CEPP South once construction is completed?

Response: The COP includes the capability to further extend and/or remove the cumulative duration criteria for operating the L-29 canal above 8.3 feet, NGVD

(referenced as the FDOT roadway constraint), while continuing to adhere to the maximum operating stage limit of 8.5 feet, NGVD. Implementation of this change would not occur without: (1) written approval from FDOT to remove the L-29 canal constraint identified in Appendix A (Water Control Plan) of the COP EIS, based on a joint evaluation of monitoring data by the USACE and the FDOT (this data evaluation is ongoing with the MWD Increment 2 Field Test); (2) demonstration of the capability of the completed MWD project components to maintain flood mitigation requirements for the 8.5 SMA under the raised L-29 canal maximum operating limit of up to 8.5 feet, NGVD; and (3) consideration of increased low-water stages within WCA 3A, including along the western L-29 canal between S-12A and S-333. The requirement for all three pre-conditions to be met may preclude these operations during the initial implementation period of the COP, since additional inflows of treated water to WCA 3A from the upstream Lake Okeechobee and EAA basins and/or additional flood mitigation requirements may be necessary.

Independent of the COP, as Phase 2 of the Tamiami Trail Next Steps Project, the DOI is partnering with the State of Florida to re-construct the non-bridged roadway sections and to install additional bridges along the remaining portions of the Tamiami Trail roadway between S-333 and S-334 (L-29 canal reach) to accommodate the design high water stage of 9.7 feet, NGVD that is planned for full implementation of the CERP. Design efforts are ongoing concurrent with the COP, and construction completion is currently anticipated by late 2024. Completion of the roadway modifications would allow for written approval from the FDOT to remove the L-29 canal constraint identified in Appendix A (Water Control Plan), independent of the joint evaluation of monitoring data for the existing roadway by the USACE and the FDOT under the MWD Increment 2 Field Test. Since the potential raising of the L-29 canal maximum operating stage limit will not be completed prior to implementation of the COP Water Control Plan in 2020, consistent with the up-front plan formulation assumptions, the higher L-29 stage limit was not considered, modeled, or evaluated during development of the COP; regional operational changes to utilize an L-29 canal maximum operating limit above 8.5 feet, NGVD will be further evaluated during CERP implementation, given that CERP also provides additional inflows to the WCA 3A and ESA consultation will be reinitiated with the Service at that point.

USFWS Comment: According to the BA, the proposed action includes active vegetation management within a 1,003-acre area of the Blue Shanty Flowway to enhance flow by reconnecting historic sloughs. The BA states that the active vegetation management would be accomplished through the use of herbicides (glyphosate). The Service requests responses to questions 1-7 below, as this additional information is necessary so the potential effects from the active vegetation management on listed species can be thoroughly evaluated:

1.) *How will the glyphosate be applied (i.e.; hand-sprayers, aerial applicators, airboats, etc.);*
2.) *What time of year will the glyphosate applications occur, and will there be multiple treatments;*
3.) *If there are multiple treatments, how many, and what timeframe will they occur;*
4.) *Will the glyphosate be formulated with additives such as surfactants or dyes;*

5.) *If there will be formulation to the glyphosate, provide a list of the additives;*
6.) *Will dead vegetation, resulting from the vegetation management, decompose in the water;*
7.) *If dead vegetation will be left to decompose, what effect will it have to water quality (i.e.; will it reduce dissolved oxygen)?*

Response: To address questions regarding the use of active vegetation management, the Corps coordinated with the SFWMD whom applied previous applications of glyphosate in support of the DPM in WCA 3B. The glyphosate will likely be applied via airboats. The applications will likely occur in the growing season (August to January). Multiple treatments are not anticipated. One treatment is expected to open the sloughs. If there are missed spots, treatment will happen approximately 6-12 months after the first spray concludes. The glyphosate may be formulated with additives (Flumioxazin, Anchor (surfactant), and Accuracy (surfactant)). Dead vegetation will decompose in the water, however water total phosphorous collected in treated areas under DPM Phase 2 continues to be less than or equal to 10 ppb. Dissolved oxygen curves are not negatively affected (i.e. neither lower in magnitude or lower in minimum O_2 values) from non-treated areas. Enhanced flow generally increases dissolved oxygen values compare to baseline, non-flowing conditions – this effect is observed in both treated and non-treated (i.e. remnant sloughs).

USFWS Comment: The Corps' transmittal letter requested formal consultation for the Cape Sable seaside sparrow and made a determination of "May Affect" but did not specify whether the species/critical habitat is "not likely to be adversely affected" or "likely to be adversely affected." When the Federal action agency determines that a "May affect, and Likely to Adversely Affect" situation exists, the action agency is required to request formal consultation with the Service for those species.

Response: The referenced language in the 2020 CEPP South BA was consistent with prior BAs submitted to USFWS for CERP and other projects related to C&SF operations. See response below regarding revised determination to a "may affect not likely to adversely affect" based upon further coordination with the USFWS.

USFWS Comment: The Corps' BA states on page 64 that, "The western marl prairies, where CSSS-A resides may experience a backwater effect due to increased flows in NESRS; however, this potential effect may be ameliorated by removal of the L-67 Extension Levee under CEPP South." There is no further analysis or explanation of how this may occur. The Service is concerned that operation of COP through the CEPP South infrastructure plan (e.g., removal of the L-67 extension levee) will change the flow volumes and patterns below the 2.6-mile bridge. Does modeling address this issue? The BA states in one location that the L-67 extension will not be backfilled (page 8, Table 1) and in another it states that it will (page 12, 6th bullet). Which is the case?

Response: Table 1 in the 2020 CEPP South BA included the following text: "Remove L-67 Extension Levee (No Backfill)" and "Backfill L-67 Canal Extension". The text referencing "No Backfill" refer to the L-67 Extension Levee removal being completed as

part of a separate construction contract (concurrent with L-67D construction) from the later CEPP contract that will backfill the complete remainder of the L-67 Extension Canal (concurrent with the L-29 Levee degrade). The text on page 12 of the 2020 CEPP South BA is correct. The 2014 CEPP Final PIR/EIS recommended that the entire remaining length of the L-67 Extension Levee (5.5 miles) be removed and the adjacent borrow canal backfilled. Removal of the L-67 Extension Levee and backfill of the adjacent borrow canal has been identified as Contract 6 with an award in FY2025. However, the SFWMD is currently proceeding with backfilling up to 0.5 miles of the L-67 Extension Canal (~10% of the remaining 5.5 mile length) with material from the removal of Old Tamiami Trail Road. The Corps will include this in the CERPRA permit application for CEPP South Contract 1. See inset in Figure 5 below for the location of the backfilling being proposed by the SFWMD. Figure 5 also represents the most up to date map for CEPP South Contract 1 features.

Modeling conducted for the 2014 CEPP Final PIR/EIS assumed removal and backfill of the L-67 extension. Modeling conduced for COP, did not include the same assumption. As stated in the 2020 CEPP BA, under COP, flows through S-343A/B, S-344, and S-12A, S-12B, S-12C, and S-12D were significantly reduced by 131,200 acre feet per year on average under ALTQ relative to ECB19RR. Decreased flow (67,000 acre feet) was also observed across Transect T17 for ALTQ which is located west of the L-67 Extension in ENP. The observed decrease was coupled with an observed increase in flow across Transect T18 into NESRS (229,000 acre feet). However, increases in flows were observed across Transect T20 (127,000 acre feet) which represents the historic southwesterly flow into north central ENP along the Shark River Slough. Removal of the L-67 Extension Levee and backfill may affect the western marl prairies and CSSS-Ax.

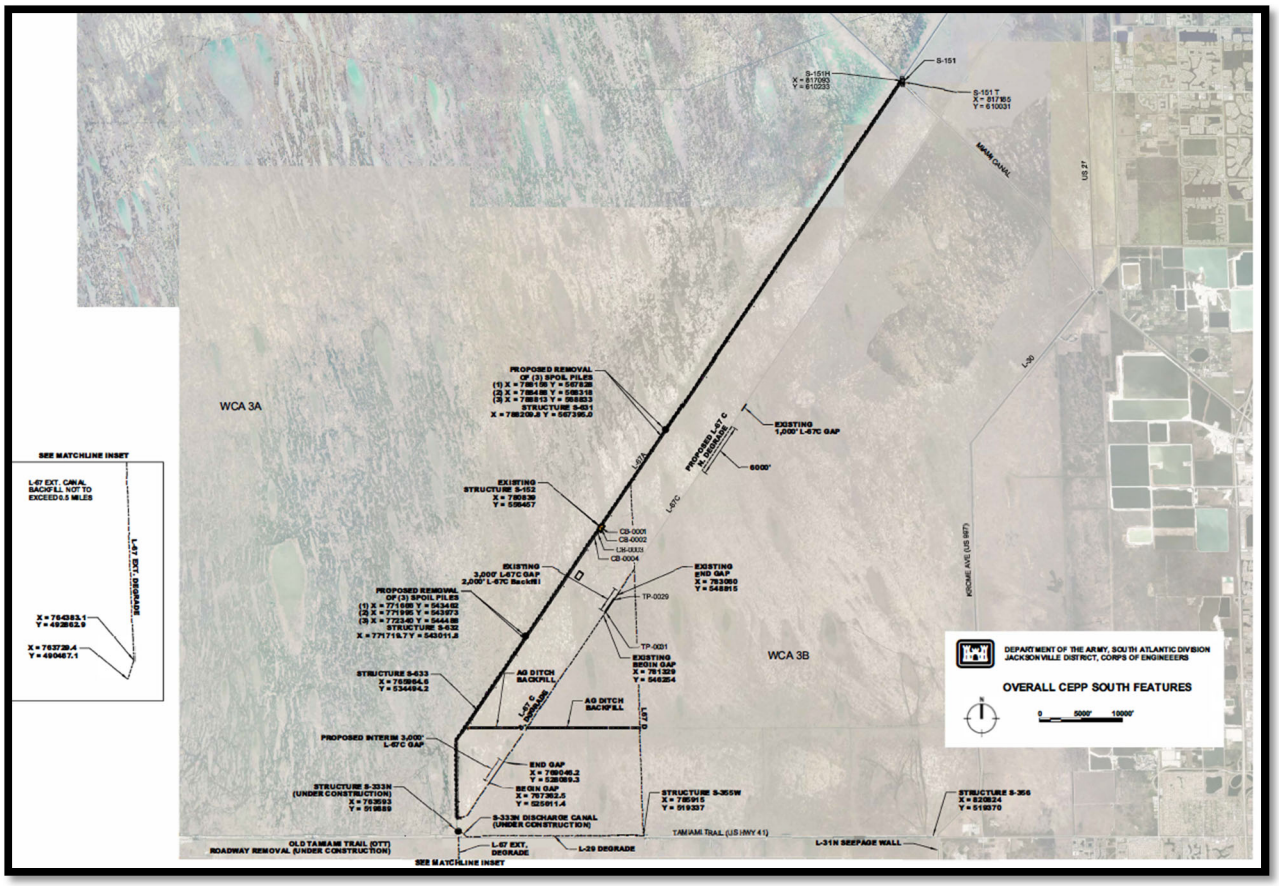


FIGURE 5. OVERALL CEPP SOUTH FEATURES

USFWS Comment: The Corps concludes the sparrow section in part with, "CEPP South may potentially raise groundwater levels in sensitive areas for the sparrow, therefore, hydrological changes associated with implementation of the action are expected to alter some of the physical and biological features essential to the nesting success and overall conservation of the subspecies. The implementation of the Proposed Action is expected to influence wetland hydroperiods causing changes in nesting and marl prairie suitability for the CSSS." It is not clear whether these hydrologic changes are a result of the construction of the CEPP South features or a result of the COP operations that will be in place. If these hydrologic changes are a result of the COP, then they should be addressed in the current COP Biological Opinion. If they are a result of the CEPP South features, then additional information will be required to determine their effect on the CSSS.

Our preliminary review of the Corps' proposed action, construction of the CEPP South features, indicates that a determination of "May affect, is not likely to adversely affect" may be appropriate for the sparrow based on its distance (approximately 9 miles)from the proposed footprint of the project. The Corps has assured the Service that any interim operations under CEPP would be strictly controlled to match those under COP and

therefore any incidental take of CSSS would be pursuant to the ITS in the Service's 2020 COP Biological Opinion.

Response: As stated previously, the COP will define operations for water management infrastructure in the study area and will serve as the baseline for initial water management operations for the CEPP South Contract 1 features. CEPP South infrastructure (S-631, S-632, and S-633) will be operated subject to the constraints identified under the COP, and in the same manner as prescribed for the S-152 structure under the DPM Phase 2 Field Test. Upon further review, the Corps has revised its determination to a "may affect, not likely to adversely affect" for the CSSS and its designated critical habitat as a result of construction of CEPP South components identified in Table 1 (above) and implementation of interim operations of CEPP South Contract 1, which will be described in the 2020 CEPP South DPOM, as the potential changes in hydrology in the action area will largely be driven by implementation of the COP.

However, the Corps is requesting, that any concurrence letter provided in response to the MANLAA determination clearly state that the construction of CEPP South features (identified in Table 1) and interim operations of the CEPP South features in Contract 1 (S-631, S-632, and S-633), which will also be described in the 2020 CEPP South DPOM, is not anticipated to exceed the take defined in the 2020 COP BO. Interim operations under CEPP South are consistent with COP operations. Therefore, any incidental take that occurs due to these operations has already been addressed in the COP consultation and that take is covered under the COP BO Incidental Take Statement. If under interim operations for CEPP South, incidental take for the COP is exceeded, re-initiation of consultation under the COP would be anticipated. As previously communicated, the Corps plans to proceed with advertisement and award of the first construction contract for CEPP South in July and September 2020, respectively. Incidental take was not provided in the 2014 CEPP Programmatic BO for the CSSS. ESA consultation is required to be complete for CEPP South for purposes of execution of the PPA. The Corps is requesting that the concurrence letter prepared by the USFWS for the revised determination, note that the letter also serves to update ESA consultation for CEPP South components previously evaluated in the 2014 CEPP Programmatic BO.

The Corps is currently recommending revisions to the 2014 CEPP DPOM to define interim operations of CEPP South features. Interim operations defined in the 2020 CEPP DPOM are anticipated to be in place until approximately 2027. A permanent update to the 2020 Water Control Plan (COP) will be pursued in the future pending consideration of: (1) new information from completion of the Lake Okeechobee System Operating Manual (LOSOM) EIS and Water Control Plan anticipated in October 2022 , which may provide a moderate increase in inflows to WCA 3A; (2) new information gained from implementation of the 2020 Water Control Plan (COP) and supporting COP AMMP; (3) construction of features associated with the Department of Interiors (DOI's) TTNS Bridging and Road Raising Features anticipated for completion in late 2024; and (4) construction and implementation of CERP, including CEPP North and the EAA Reservoir A-2 Stormwater Treatment Area (STA), components identified in the Integrated Delivery Schedule (IDS) for the South Florida Ecosystem Restoration Program. If any effects to

listed species associated with future revisions to the 2020 CEPP DPOM, the Corps will reinitiate ESA consultation, as appropriate under 50 CFR § 402.16.

USFWS Comment: The Corps' transmittal letter requested formal consultation for the Everglade snail kite and made a determination of "May Affect" but did not specify whether the species/critical habitat is "not likely to be adversely affected" or "likely to be adversely affected." When the Federal action agency determines that a "May affect, and Likely to Adversely Affect" situation exists, the action agency is required to request formal consultation with the Service for those species.

Response: The referenced language in the BA is consistent with prior BAs submitted to USFWS for CERP and other projects related to C&SF operations. See response below regarding revised determination to a "may affect not likely to adversely affect" based upon further coordination with the USFWS.

USFWS Comment: The BA does not identify conservation measures for the Everglade snail kite that will be implemented as part of the action to minimize potential adverse effects to the species. The Service requests for the Corps to consider incorporating the Service's Standard Snail Kite Management Guidelines. These guidelines recommend maintaining a 150-meter no-entry zone and a 500-meter limited activity zone around all active snail kite nests within the action area. The commitment to this conservation measure may support a "May affect, is not likely to adversely affect" determination for the Everglade snail kite.

Response: The Corps concurs with incorporation of the Service's Standard Snail Kite Management Guidelines during construction of CEPP South components. Upon further review, the Corps has revised its determination to "may affect, not likely to adversely affect" for the Everglade snail kite and its designated critical habitat as a result of construction of CEPP South components identified in Table 1 (above) and implementation of interim operations of CEPP South Contract 1 features, which will be described in the 2020 CEPP South DPOM, as the potential changes in hydrology in the action area will largely be driven by implementation of the COP.

However, the Corps is requesting that any concurrence letter provided in response to the MANLAA determination, clearly state that the construction of CEPP South features (identified in Table 1) and interim operations of CEPP South features in Contract 1, which will also be described in the 2020 CEPP South DPOM, is not anticipated to exceed the take defined in the 2020 COP BO. Interim operations under CEPP South are consistent with COP operations. Therefore, any incidental take that occurs due to these operations has already been addressed in the COP consultation and that take is covered under the COP BO Incidental Take Statement. The Corps is requesting that the concurrence letter prepared by the USFWS for the revised determination, note that the letter also serves to update ESA consultation for CEPP South components previously evaluated in the 2014 CEPP Programmatic BO.

USFWS Comment: The Corps' transmittal letter requested formal consultation for the wood stork and made a determination of "May Affect" but did not specify whether the species is "not likely to be adversely affected" or "likely to be adversely affected." When the Federal action agency determines that a "May affect, and Likely to Adversely Affect" situation exists, the action agency is required to request formal consultation with the Service for those species.

Response: The referenced language in the BA is consistent with prior BAs submitted to USFWS for CERP and other projects related to C&SF operations. See response below regarding revised determination to a "may affect not likely to adversely affect" based upon further coordination with the USFWS.

USFWS Comment: The Service requires an analysis of foraging prey base losses and enhancements for projects with greater than 2.02 hectares (5 acres) of wetland impacts (Service 2010). The BA does not include a foraging analysis to evaluate the impacts from the construction of the CEPP South components and the active vegetation management activity. The Service requested this information by email on March 3, 2020 and March 17, 2020, respectively. The Corps provided the hydroperiod class information needed for this analysis by email on April 2, 2020. The Service will evaluate the project effects to foraging prey base and foraging habitat based on this information.

Response: The Corps concurs with the use of a wood stork foraging analysis to evaluate the impacts from the construction of the CEPP South components and the active vegetation management activity. The Corps updated the hydroperiod tables submitted on April 2, 2020 on May 7, 2020 with the revised project feature information and sent via separate correspondence.

USFWS Comment: The Corps stated that it will implement construction conservation measures as outlined in the Service's Habitat Management Guidelines for the Wood Stork in the Southeast Region (Service 1990). These guidelines recommend maintaining a 229-meter (750 ft) protection zone around feeding sites when storks are present, 457-meter (1,500 ft) primary zone and a 762-meter (2,500 ft) secondary zone around all active wood stork nests within the action area. The commitment to this conservation measure may support a "May affect, is not likely to adversely affect" determination for the wood stork.

Response: Upon further review, the Corps has revised its determination to "may affect, not likely to adversely affect" for the wood stork as a result of construction of CEPP South components identified in Table 1 (above) and implementation of interim operations of CEPP South Contract 1 features, which will be described in the 2020 CEPP South DPOM, as the potential changes in hydrology in the action area will largely be driven by implementation of the COP.

However, the Corps is requesting that any concurrence letter provided in response to the MANLAA determination clearly state that the construction of CEPP South features (identified in Table 1) and interim operations of the CEPP South features in Contract 1,

which will also be described in the 2020 CEPP South DPOM, is not anticipated to exceed the take defined in the 2020 COP BO. Interim operations under CEPP South are consistent with COP operations. Therefore, any incidental take that occurs due to these operations has already been addressed in the COP consultation and that take is covered under the COP BO Incidental Take Statement. The Corps is requesting that the concurrence letter prepared by the USFWS for the revised determination, note that the letter also serves to update ESA consultation for CEPP South components previously evaluated in the 2014 CEPP Programmatic BO.

USFWS Comment: The Corps made a determination of "May affect, but is not likely to adversely affect" the eastern indigo snake in the BA. The Service is developing a revised consultation Key for the eastern indigo snake. While the Key is being developed, based on guidance in a November 22, 2019, email from the State Supervisor (subject: Approved distances for consultations involving indigo snakes) the Service has identified an interim approach on when we would recommend consultation under the Act on eastern indigo snakes based on the expectation that an individual may be present.

In accordance with this guidance, the South Florida Ecological Services Field Office buffered known eastern indigo snake occurrence locations with a radius of 0.62 miles. It was determined that there is an indigo snake occurrence within the proposed S-356 pump station replacement project. The BA should provide an analysis of the construction impacts associated with the S-356 Pump Replacement project including the construction footprint, time of year, and duration that construction activities will occur. The BA should also include a description of where equipment and materials will be staged and how much material will be excavated from the area and how this material will be disposed. This information is needed to document the Corps' conclusions and the rationale to support the conclusion regarding the effects of their proposed actions on the eastern indigo snake. The Corps commits to avoiding and minimizing adverse effects during construction activities as outlined in the Draft Standard Protection Measures for the Eastern Indigo Snake (Service 2013b). The commitment to this conservation measure may reduce any potential adverse effects to the eastern indigo snake.

Response: As noted above, contract award for S-356 is expected in September of 2022 with the duration of the construction estimated to be four years beyond contract award per the south Florida IDS. Finalized footprints, including where equipment and materials will be staged for S-356 is currently under development. Quantities of how much material will be excavated for each structure, as well as how the material will be disposed of is also under development. See the above response with respect to preliminary design details currently available for S-356.

USFWS Comment: The BA has a "May affect, but is not likely to adversely affect" determination for the following species and their critical habitats: Bartram's Hairstreak Butterfly, Florida Leafwing Butterfly and their Critical Habitats; Blodgett's Silverbush, Deltoid Spurge, Everglades Bully, Florida Pineland Crabgrass, Florida Prairie Clover, Garber's Spurge, Pineland Sandmat, Small's Milkpea, and Tiny Polygala. The Service believes that a "No effect" determination may be appropriate for these species and critical

habitats because they are not present in the action area of CEPP South, which includes the construction footprint of the features and the area that will be affected by the associated active vegetation management. These species are within the action area of the COP which is currently being evaluated under a separate consultation. All operations of CEPP South features will be in accordance with the COP that is expected to begin implementation in August 2020. Therefore, no additional effects are anticipated for these species as a result of CEPP South.

Response: The CEPP South BA submitted on January 23, 2020, contained a "No Effect" determination for the Deltoid Spurge, Small's Milkpea, and Tiny Polygala. Reference Section 6.3.1.1 (Pg 44) and Table 3 (Pg 28-30) in the 2020 CEPP South BA. The Corps acknowledges that the CEPP South BA transmittal letter contained an error in that the effects determinations for several species did not match those in the 2020 CEPP South BA. Regardless, of that error, the Corps agrees with a "No Effect" determination for the referenced listed species noted in correspondence from USFWS dated April 14, 2020. The Corps is amending the 2020 CEPP South BA through this correspondence to reflect that concurrence. Please see the revised table below, which reflects these changes. The table below also shows the revised determinations for the CSSS, Everglade snail kite, and wood stork.

REVISED TABLE 3 FROM 2020 CEPP SOUTH BA. STATUS OF FEDERALLY THREATENED AND ENDANGERED SPECIES UNDER USFFWS' JURISDICTION WITH THE POTENTIAL TO OCCUR WITHIN THE CEPP SOUTH ACTION AREA AND THE CORPS' EFFECTS DETERMINATION (E: ENDANGERED; T: THREATENED; SA: SIMILARITY OF APPEARANCE; CH: CRITICAL HABITAT, C: CANDIDATE SPECIES)

Common Name	Scientific Name	Status	May Affect Not Likely to Adversely Affect	May Affect	No Effect
Mammals					
Florida panther	*Puma concolor coryi*	E	X		
Florida manatee	*Trichechus manatus latirostris*	E, CH	X		
Florida bonneted bat	*Eumops floridanus*	E	X		
Birds					
Cape Sable seaside sparrow	*Ammodramus maritimus mirabilis*	E, CH	X		
Everglade snail kite	*Rostrhamus sociabilis plumbeus*	E, CH	X		

Common Name	Scientific Name	Status	May Affect Not Likely to Adversely Affect	May Affect	No Effect
Piping plover	*Charadrius melodus*	T			X
Red-cockaded woodpecker	*Picoides borealis*	E			X
Roseate tern	*Sterna dougallii*	T			X
Wood stork	*Mycteria americana*	T	X		
Reptiles					
American Alligator	*Alligator mississip piensis*	T, SA	X		
American crocodile	*Crocodyl usacutus*	T, CH	X		
Eastern indigo snake	*Drymarchon corais couperi*	T	X		
Gopher tortoise	*Gopherus polyphemus*	C			X
Invertebrates					
Bartram's hairstreak butterfly	*Strymon acis bartrami*	E, CH			X
Florida leafwing butterfly	*Anaea troglodyta floridalis*	E, CH			X
Miami blue butterfly	*Cyclargus thomasi bethunebakeri*	E			X
Schaus swallowtail butterfly	*Heraclides aristodemus ponceanus*	E			X
Stock Island tree snail	*Orthalicus reses (not incl. nesodryas)*	T			X
Plants					
Crenulate lead plant	*Amorpha crenulata*	E			X
Deltoid spurge	*Chamaesyce deltoidea spp.*	E			X

Common Name	Scientific Name	Status	May Affect Not Likely to Adversely Affect	May Affect	No Effect
	deltoidea				
Garber's spurge	*Chamaesyce garberi*	T			X
Okeechobee gourd	*Cucurbita okeechobeensis ssp. okeechobeenis*	E			X
Small's milkpea	*Galactia smallii*	E			X
Tiny polygala	*Polygala smallii*	E			X
Big pine partridge pea	*Chamaecrista lineata var. keyensis*	E			X
Blodgett's silverbush	*Argythamnia blodgettii*	T			X
Cape Sable thoroughwort	*Chromolaena frustrata*	E, CH			X
Carter's small-flowered flax	*Linum carteri var. carteri*	E, CH			X
Everglades bully	*Sideroxylon reclinatum spp. austrofloridense*	T			X
Florida brickell-bush	*Brickellia mosieri*	E, CH			X
Florida bristle fern	*Trichomanes punctatum spp. floridanum*	E			X
Florida pineland crabgrass	*Digitaria pauciflora*	T			X
Florida prairie clover	*Dalea carthagenesis floridana*	E			X
Florida semaphore cactus	*Consolea corallicola*	E, CH			X
Pineland sandmat	*Chaemaesyce deltoidea pinetorium*	T			X

Common Name	Scientific Name	Status	May Affect Not Likely to Adversely Affect	May Affect	No Effect
Sand flax	*Linum arenicola*	E			X

APPENDIX D.2 NATIONAL HISTORIC PRESERVATION ACT PERTINENT CORREPONDENCE

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D.2 National Historic Preservation Act Pertinent Correspondence

This appendix contains pertinent correspondence related to the Central Everglades Planning South (CEPP South) and the National Historic Preservation Act (NHPA). A brief description of pertinent correspondence is provided below.

NHPA Consultation

- March 30, 2020: U.S. Army Corps of Engineers (Corps) correspondence to Everglades National Park (ENP) to invite participation as a signatory in development of Programmatic Agreement for CEPP South
- March 30, 2020: Corps correspondence to State Historic Preservation Officer (SHPO) to invite participation as a signatory in development of Programmatic Agreement for CEPP South
- March 30, 2020: Corps correspondence to South Florida Water Management District (SFWMD) to invite participation as a concurring party in development of Programmatic Agreement for CEPP South
- March 30, 2020: Corps correspondence to Miccosukee Indian Tribe of Florida to invite participation as a concurring party in development of Programmatic Agreement for CEPP South
- March 30, 2020: Corps correspondence to Seminole Tribe of Florida to invite participation as a concurring party in development of Programmatic Agreement for CEPP South
- March 30, 2020: Corps correspondence to Seminole Nation of Oklahoma to invite participation as a concurring party in development of Programmatic Agreement for CEPP South
- March 30, 2020: Corps correspondence to Thlopthlocco Tribal Town to invite participation as a concurring party in development of Programmatic Agreement for CEPP South
- March 30, 2020: Corps correspondence to Miami Dade County to invite participation as a consulting party in development of Programmatic Agreement for CEPP South
- May 1, 2020: Corps correspondence to SHPO on potential effect to historic properties under Section 106 of the NRPA for CEPP South Contract 1 features
- May 1, 2020: Corps correspondence to Miccosukee Indian Tribe of Florida on potential effect to historic properties under Section 106 of the NRPA for CEPP South Contract 1 features
- May 1, 2020: Corps correspondence to Seminole Tribe of Florida on potential effect to historic properties under Section 106 of the NRPA for CEPP South Contract 1 features
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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-8915

Planning and Policy Division
Environmental Branch

MAR 30 2020

Pedros Ramos
Superintendent
Everglades and Dry Tortugas National Parks
40001 SR-9336
Homestead, FL 33034

Re: Central Everglades Planning Project Cultural Resources Working Group and CEPP South Programmatic Agreement

Dear Mr. Ramos:

The U.S. Army Corps of Engineers, Jacksonville District (Corps), is planning to implement the Central Everglades Planning Project (CEPP), as authorized by Congress under P.L 144-322 Water Infrastructure Improvements (WIIN) Act of 2016. The purpose of this letter is to formally invite participation in the CEPP Cultural Resources Working Group (Working Group) and invite participation as a Signatory in the development of a Programmatic Agreement for CEPP South. The CEPP is a multi-component subset of Comprehensive Everglades Restoration Plan projects intended to improve the quality, timing, duration, and volume of water flowing from Lake Okeechobee to the south, through the Everglades, and out to Florida Bay. The CEPP has been divided into three components, based on geography and scope (Figure 1). CEPP North consists of construction features on the northern end of Water Conservation Area 3. CEPP South consists of construction features in the southern portion of Water Conservation Area 3 and the northern portion of Everglades National Park. CEPP New Water includes new storage and treatment features in the Everglades Agricultural Area as well as the final operations manual. The area of potential effects, based on preliminary modeling) for all of the CEPP extends from the Everglades Agricultural Area into Everglades National Park, including state, federal, private, and Native American lands (Figure 2).

The Corps recognizes the scale and scope of CEPP requires ongoing coordination and consultation. The Corps intends the Working Group to serve as a venue to provide information, collaborate, receive feedback, and develop plans for ensuring compliance with Section 106 of the National Historic Preservation Act (NHPA) during the construction of the CEPP. The CEPP is a large and complex project, with intricate dependencies, dozens of features, and broad potential effects. The input from the Working Group will be used by the Corps to determine areas of potential effect, identify historic properties, assess adverse effects to historic properties, and resolve any adverse effects.

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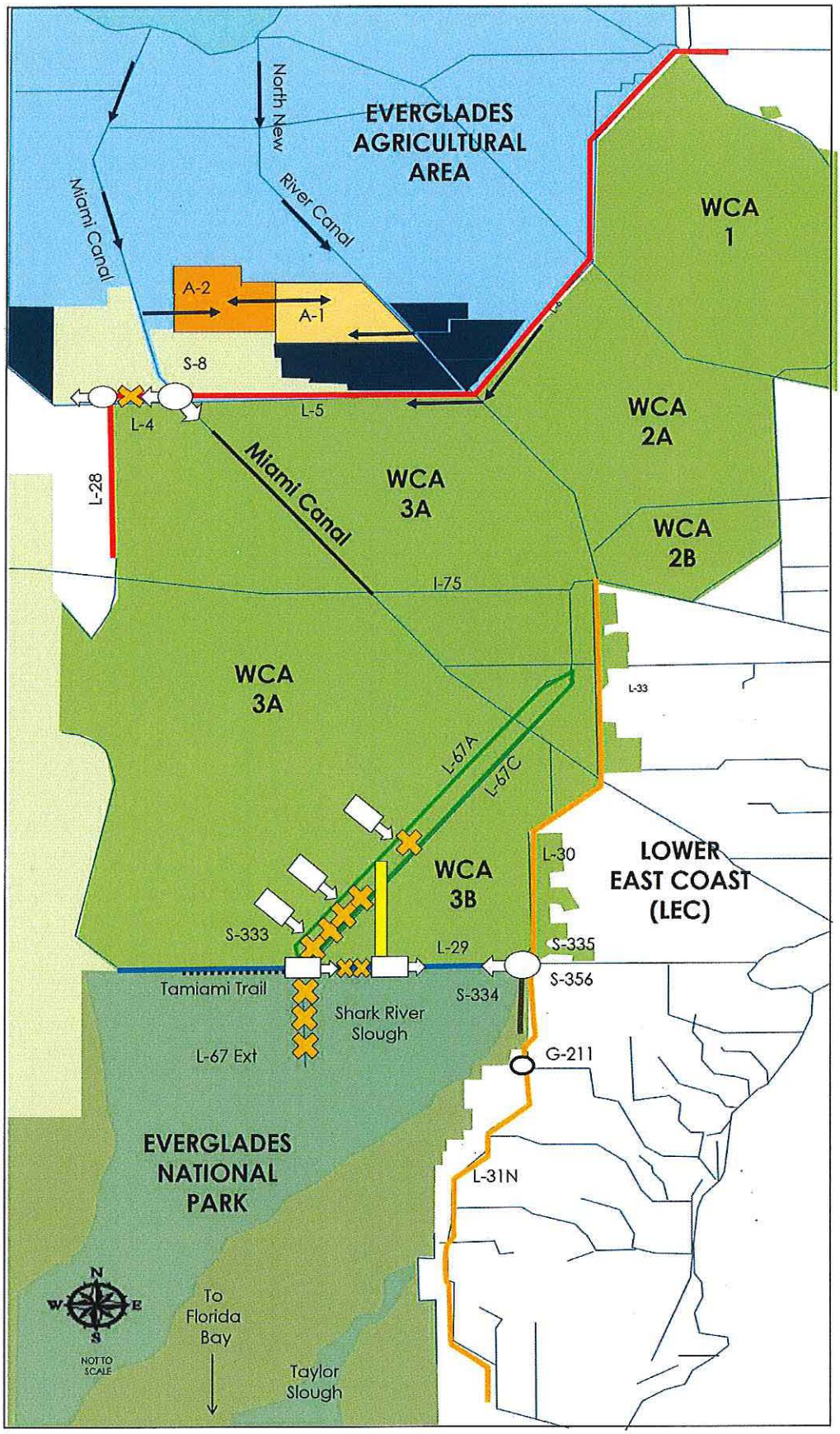
The Corps requests a response regarding participation in the Working Group and Programmatic Agreement within 30 days. Please contact Mr. Christopher Altes with any question or concerns by email at christopher.f.altes@usace.army.mil or by telephone at (904) 232-1694.

Sincerely,

Angela E. Dunn
Chief, Environmental Branch

Enclosure



Areas "North of the Red Line" are part of CEPP New Water

Areas "South of the Red Line," and north of I-75, are CEPP North

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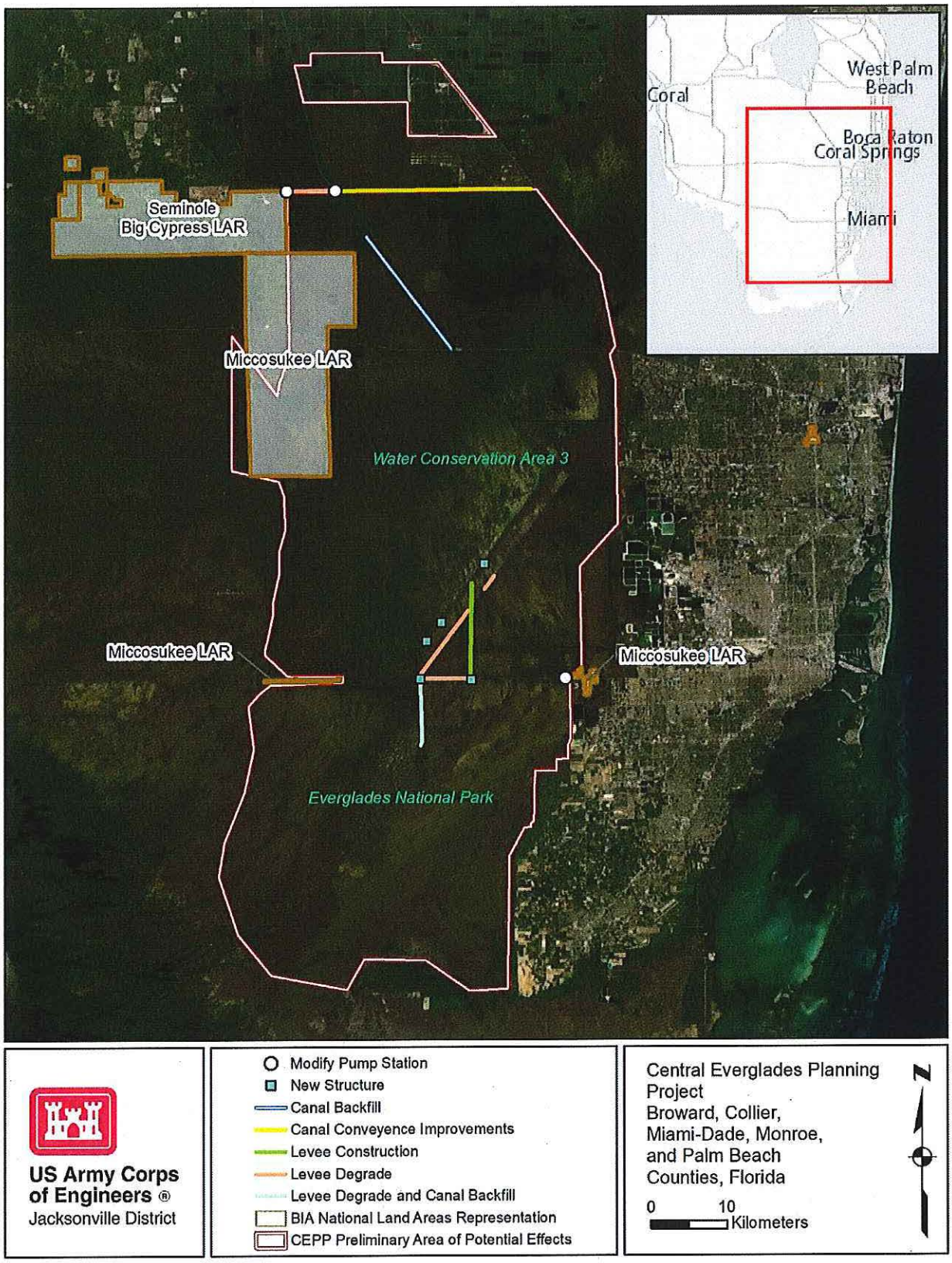

Figure 2. Preliminary CEPP Area of Potential Effects

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-8915

Planning and Policy Division
Environmental Branch

MAR 30 2020

Tim Parsons, Ph.D.
State Historic Preservation Officer
Division of Historical Resources
500 South Bronough Street
Tallahassee, Florida 32399-0250

Re: Central Everglades Planning Project Cultural Resources Working Group and CEPP South Programmatic Agreement

Dear Dr. Parsons:

The U.S. Army Corps of Engineers, Jacksonville District (Corps), is planning to implement the Central Everglades Planning Project (CEPP), as authorized by Congress under P.L 144-322 Water Infrastructure Improvements (WIIN) Act of 2016. The purpose of this letter is to formally invite participation in the CEPP Cultural Resources Working Group (Working Group) and invite participation as a Signatory in the development of a Programmatic Agreement for CEPP South. The CEPP, is a multi-component subset of Comprehensive Everglades Restoration Plan projects intended to improve the quality, timing, duration, and volume of water flowing from Lake Okeechobee to the south, through the Everglades, and out to Florida Bay. The CEPP has been divided into three components, based on geography and scope (Figure 1). CEPP North consists of construction features on the northern end of Water Conservation Area 3. CEPP South consists of construction features in the southern portion of Water Conservation Area 3 and the northern portion of Everglades National Park. CEPP New Water includes new storage and treatment features in the Everglades Agricultural Area as well as the final operations manual. The area of potential effects, based on preliminary modeling) for all of the CEPP extends from the Everglades Agricultural Area into Everglades National Park, including state, federal, private, and Native American lands (Figure 2).

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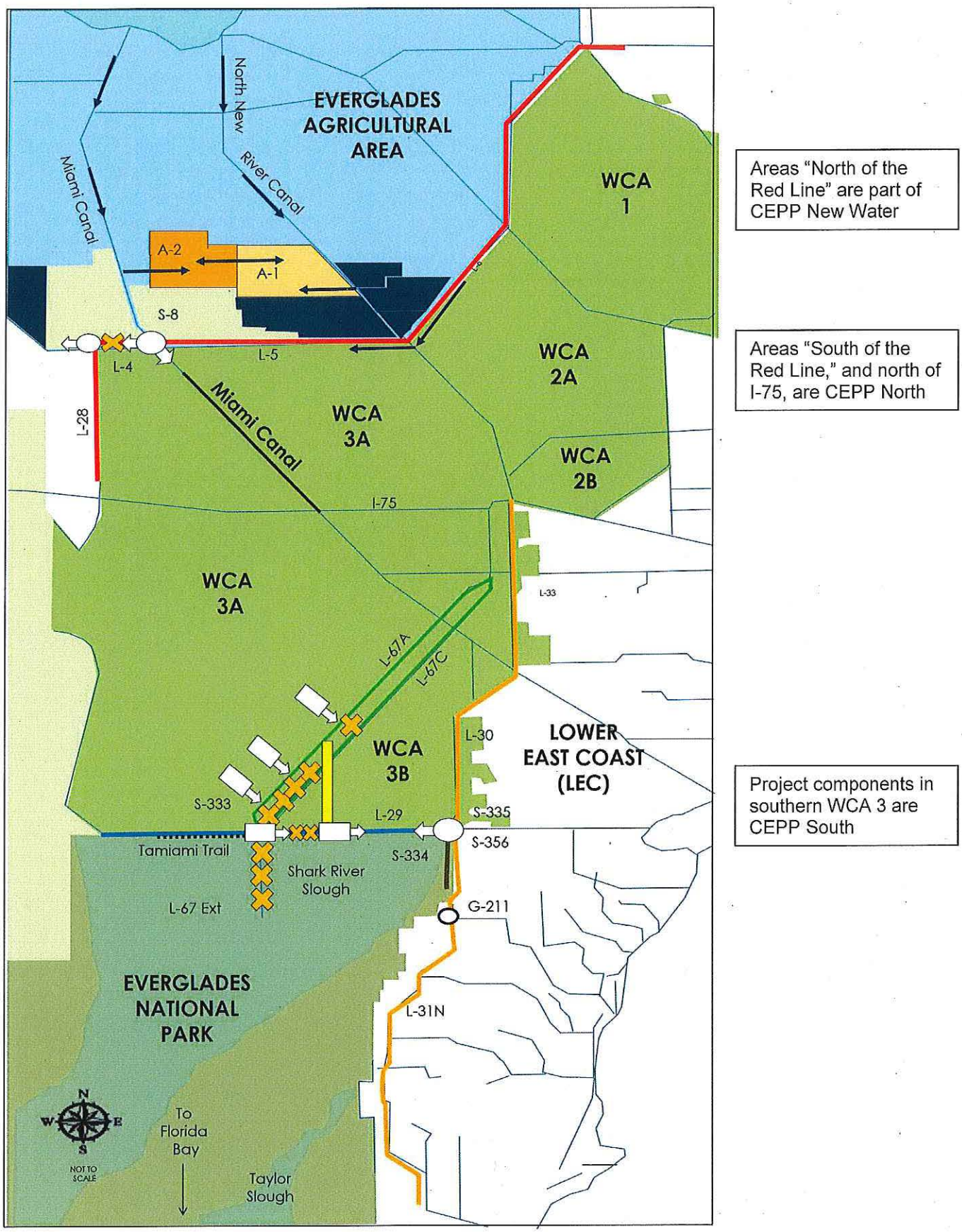
Sincerely,

Angela E. Dunn
Chief, Environmental Branch

Enclosure



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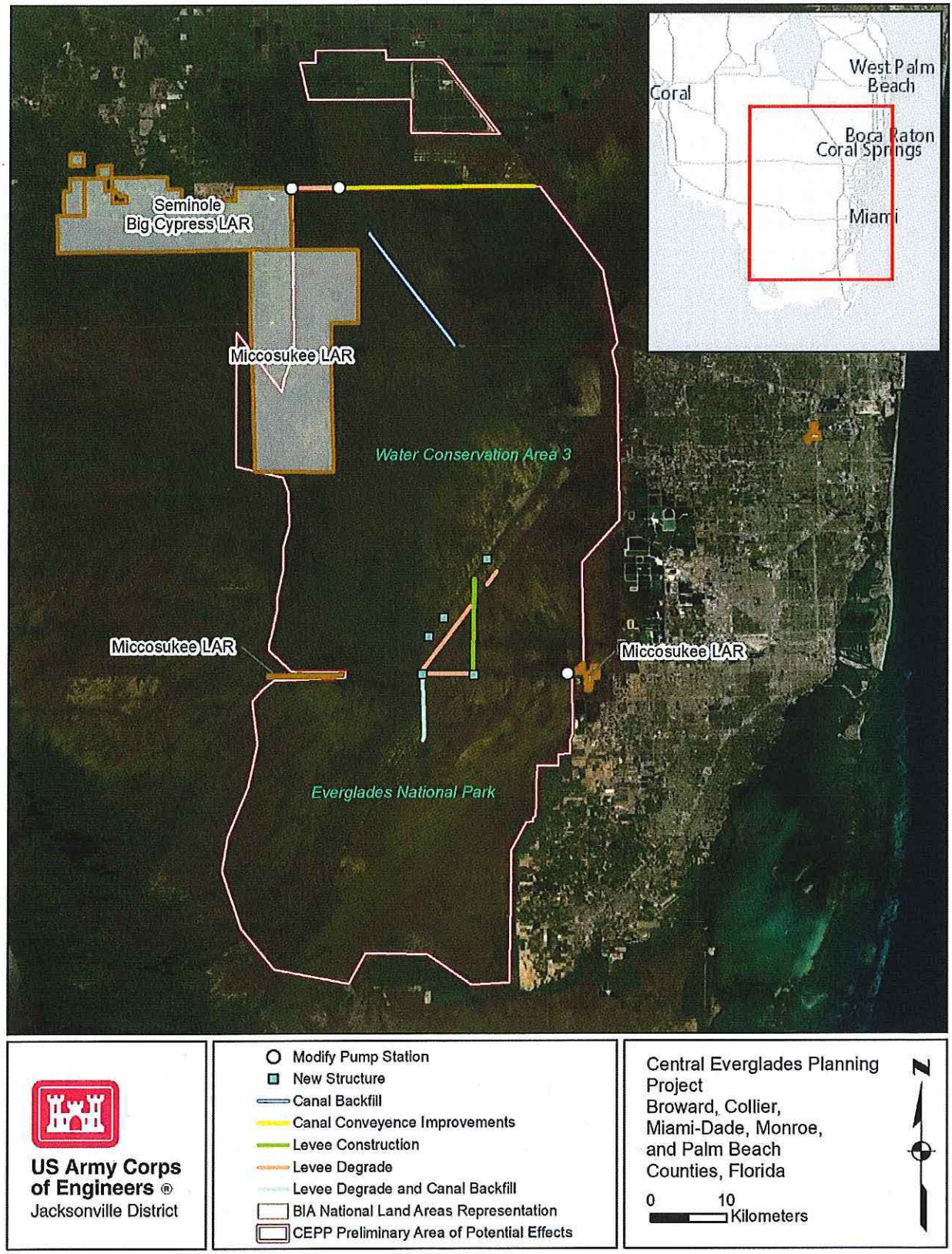

Figure 2. Preliminary CEPP Area of Potential Effects

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-8915

Planning and Policy Division
Environmental Branch

MAR 30 2020

Drew Bartlett
Executive Director
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, FL 33406

Re: Central Everglades Planning Project Cultural Resources Working Group and CEPP South Programmatic Agreement

Dear Mr. Bartlett:

The U.S. Army Corps of Engineers, Jacksonville District (Corps), is planning to implement the Central Everglades Planning Project (CEPP), as authorized by Congress under P.L 144-322 Water Infrastructure Improvements (WIIN) Act of 2016. The purpose of this letter is to formally invite participation in the CEPP Cultural Resources Working Group (Working Group) and invite participation as a Concurring Party in the development of a Programmatic Agreement for CEPP South. The CEPP is a multi-component subset of Comprehensive Everglades Restoration Plan projects intended to improve the quality, timing, duration, and volume of water flowing from Lake Okeechobee to the south, through the Everglades, and out to Florida Bay. The CEPP has been divided into three components, based on geography and scope (Figure 1). CEPP North consists of construction features on the northern end of Water Conservation Area 3. CEPP South consists of construction features in the southern portion of Water Conservation Area 3 and the northern portion of Everglades National Park. CEPP New Water includes new storage and treatment features in the Everglades Agricultural Area as well as the final operations manual. The area of potential effects, based on preliminary modeling) for all of the CEPP extends from the Everglades Agricultural Area into Everglades National Park, including state, federal, private, and Native American lands (Figure 2).

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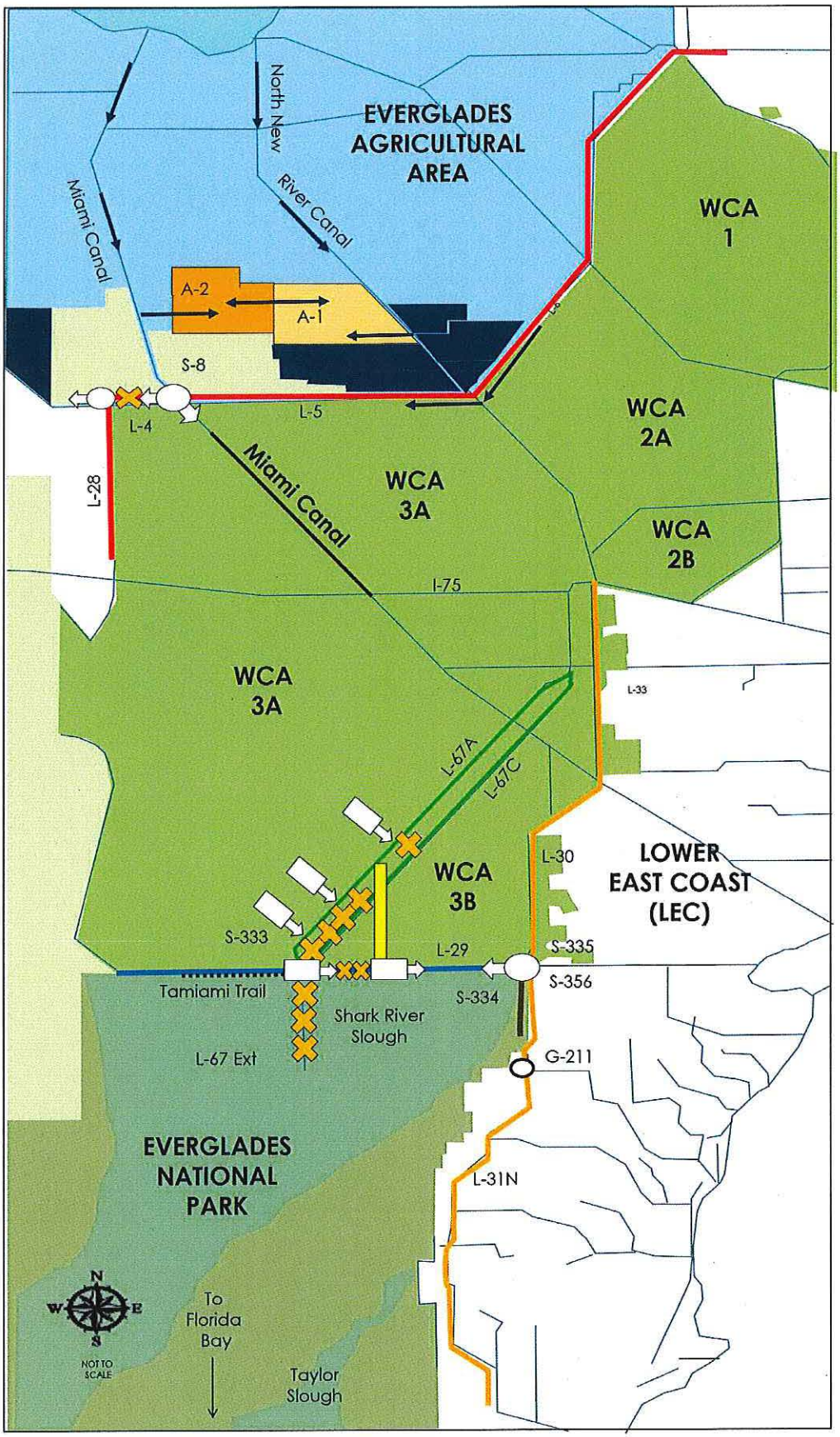
The Corps requests a response regarding participation in the Working Group and Programmatic Agreement within 30 days. Please contact Mr. Christopher Altes with any question or concerns by email at christopher.f.altes@usace.army.mil or by telephone at (904) 232-1694.

Sincerely,

Angela E. Dunn
Chief, Environmental Branch

Enclosure



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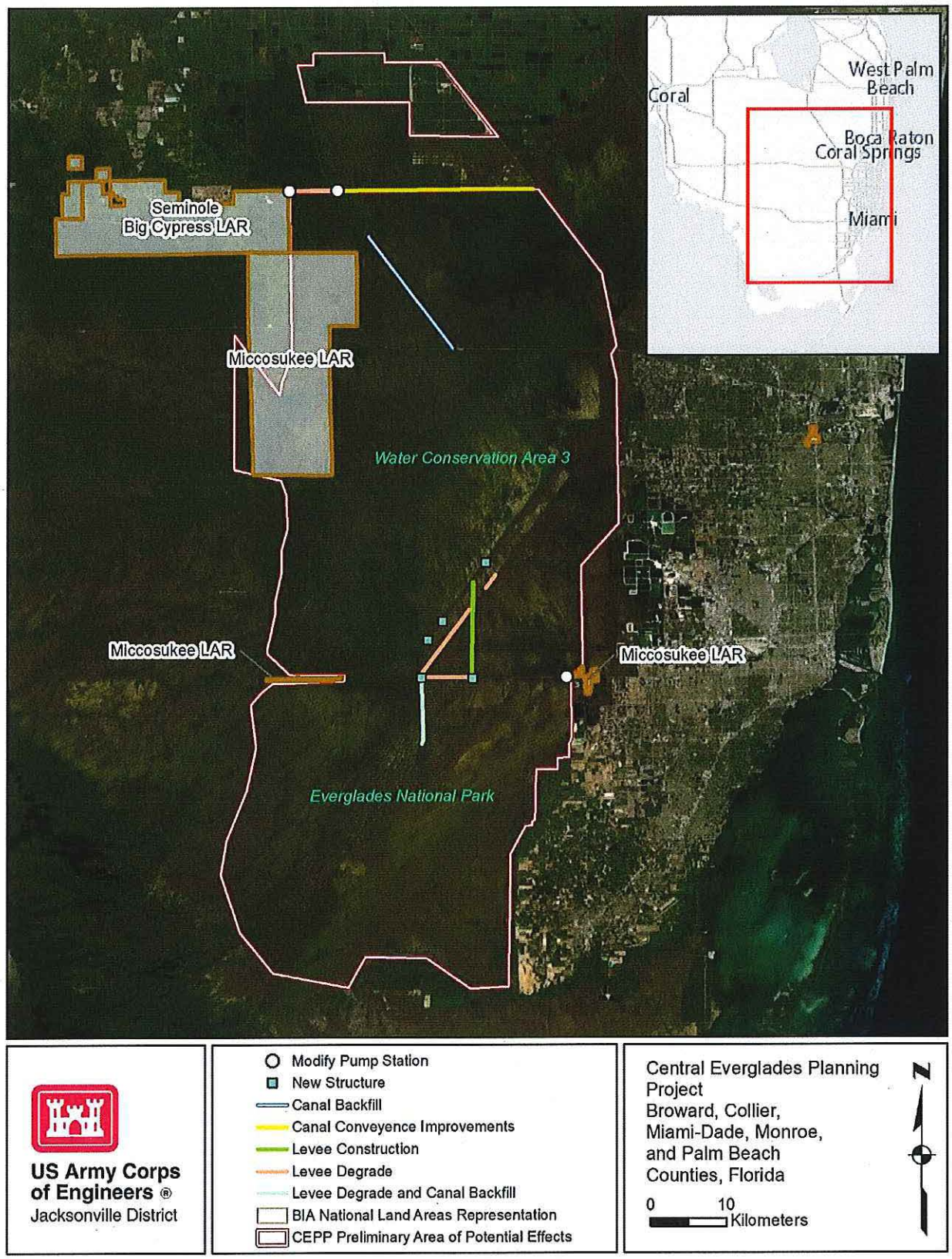

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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-8915

Planning and Policy Division
Environmental Branch

MAR 30 2020

Kevin Donaldson
NAGPRA Representative
Miccosukee Tribe of Indians of Florida
P.O. Box 440021
Tamiami Station
Miami, FL 33144

Re: Central Everglades Planning Project Cultural Resources Working Group and CEPP South Programmatic Agreement

Dear Mr. Donaldson:

The U.S. Army Corps of Engineers, Jacksonville District (Corps), is planning to implement the Central Everglades Planning Project (CEPP), as authorized by Congress under P.L 144-322 Water Infrastructure Improvements (WIIN) Act of 2016. The purpose of this letter is to formally invite participation in the CEPP Cultural Resources Working Group (Working Group) and invite participation as a Concurring Party in the development of a Programmatic Agreement for CEPP South. The CEPP is a multi-component subset of Comprehensive Everglades Restoration Plan projects intended to improve the quality, timing, duration, and volume of water flowing from Lake Okeechobee to the south, through the Everglades, and out to Florida Bay. The CEPP has been divided into three components, based on geography and scope (Figure 1). CEPP North consists of construction features on the northern end of Water Conservation Area 3. CEPP South consists of construction features in the southern portion of Water Conservation Area 3 and the northern portion of Everglades National Park. CEPP New Water includes new storage and treatment features in the Everglades Agricultural Area as well as the final operations manual. The area of potential effects, based on preliminary modeling) for all of the CEPP extends from the Everglades Agricultural Area into Everglades National Park, including state, federal, private, and Native American lands (Figure 2).

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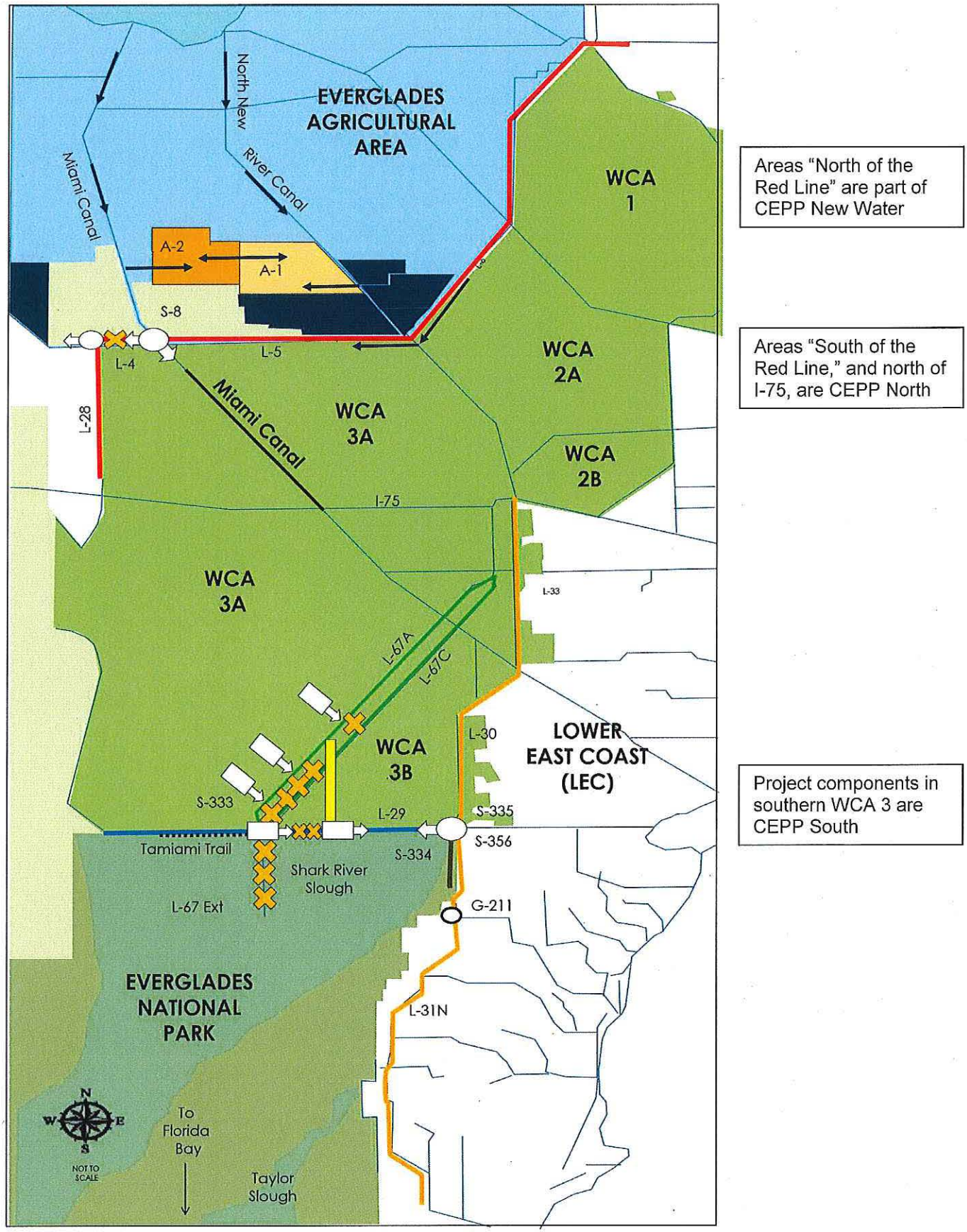
Sincerely,

Angela E. Dunn
Chief, Environmental Branch

Enclosure



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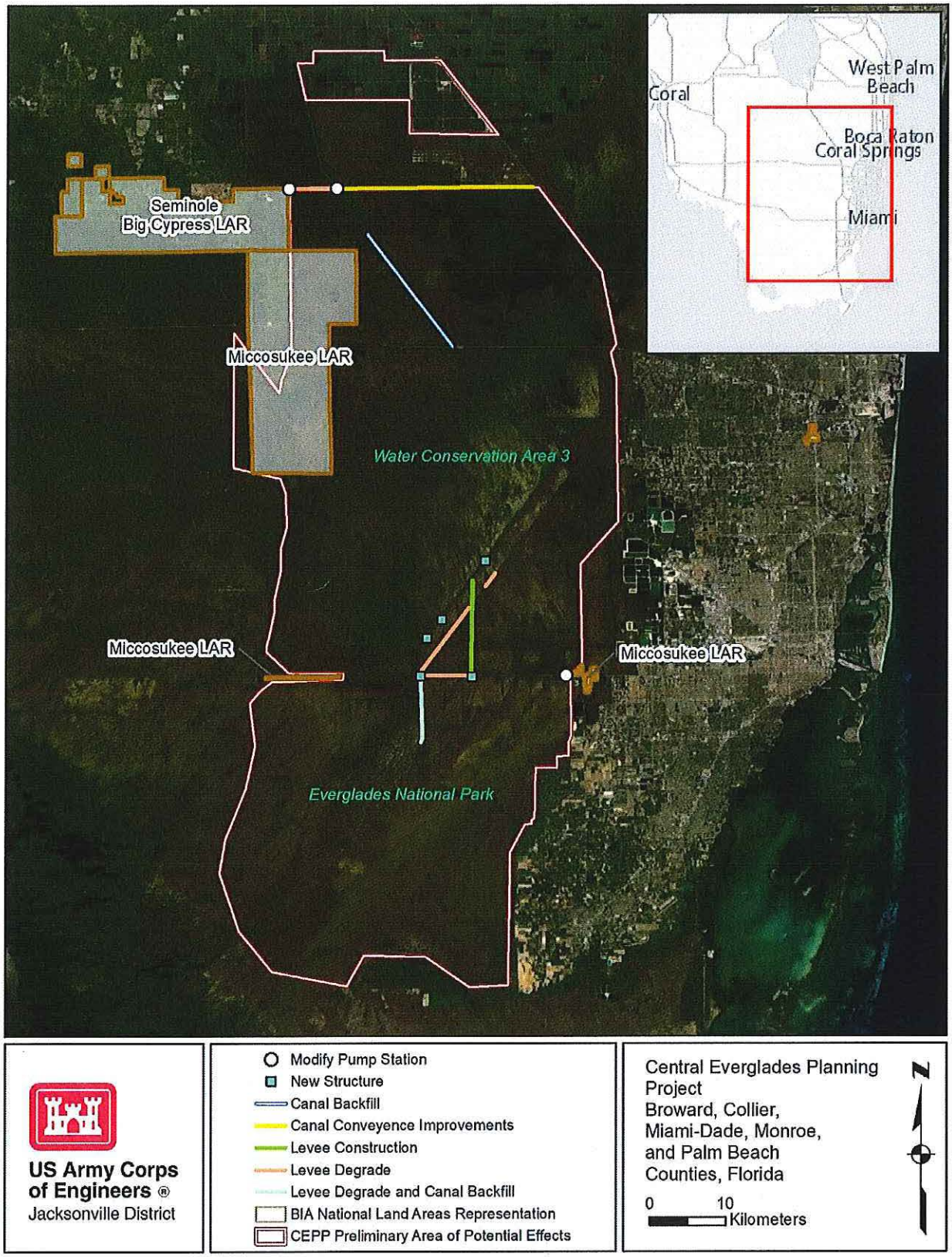

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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-8915

Planning and Policy Division
Environmental Branch

MAR 30 2020

Paul Backhouse, Ph.D
Tribal Historic Preservation Officer
Seminole Tribe of Florida
Ah Tah Thi Ki Museum
30290 Josie Billie Hwy., PMB 1004
Clewiston, FL 33440

Re: Central Everglades Planning Project Cultural Resources Working Group and CEPP South Programmatic Agreement

Dear Dr. Backhouse:

The U.S. Army Corps of Engineers, Jacksonville District (Corps), is planning to implement the Central Everglades Planning Project (CEPP), as authorized by Congress under P.L 144-322 Water Infrastructure Improvements (WIIN) Act of 2016. The purpose of this letter is to formally invite participation in the CEPP Cultural Resources Working Group (Working Group) and invite participation as a Concurring Party in the development of a Programmatic Agreement for CEPP South. The CEPP is a multi-component subset of Comprehensive Everglades Restoration Plan projects intended to improve the quality, timing, duration, and volume of water flowing from Lake Okeechobee to the south, through the Everglades, and out to Florida Bay. The CEPP has been divided into three components, based on geography and scope (Figure 1). CEPP North consists of construction features on the northern end of Water Conservation Area 3. CEPP South consists of construction features in the southern portion of Water Conservation Area 3 and the northern portion of Everglades National Park. CEPP New Water includes new storage and treatment features in the Everglades Agricultural Area as well as the final operations manual. The area of potential effects, based on preliminary modeling) for all of the CEPP extends from the Everglades Agricultural Area into Everglades National Park, including state, federal, private, and Native American lands (Figure 2).

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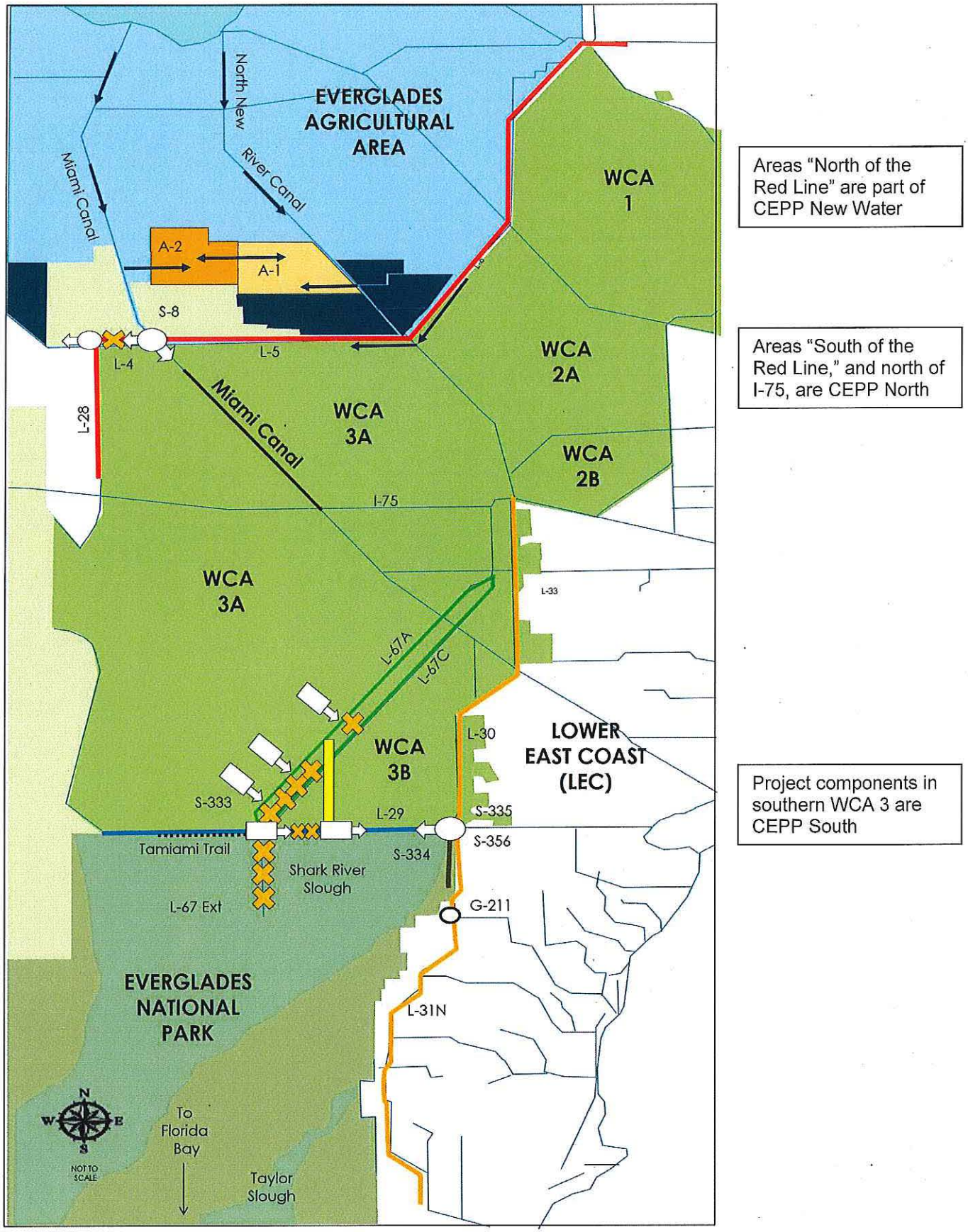
Angela E. Dunn
Chief, Environmental Branch

Enclosure



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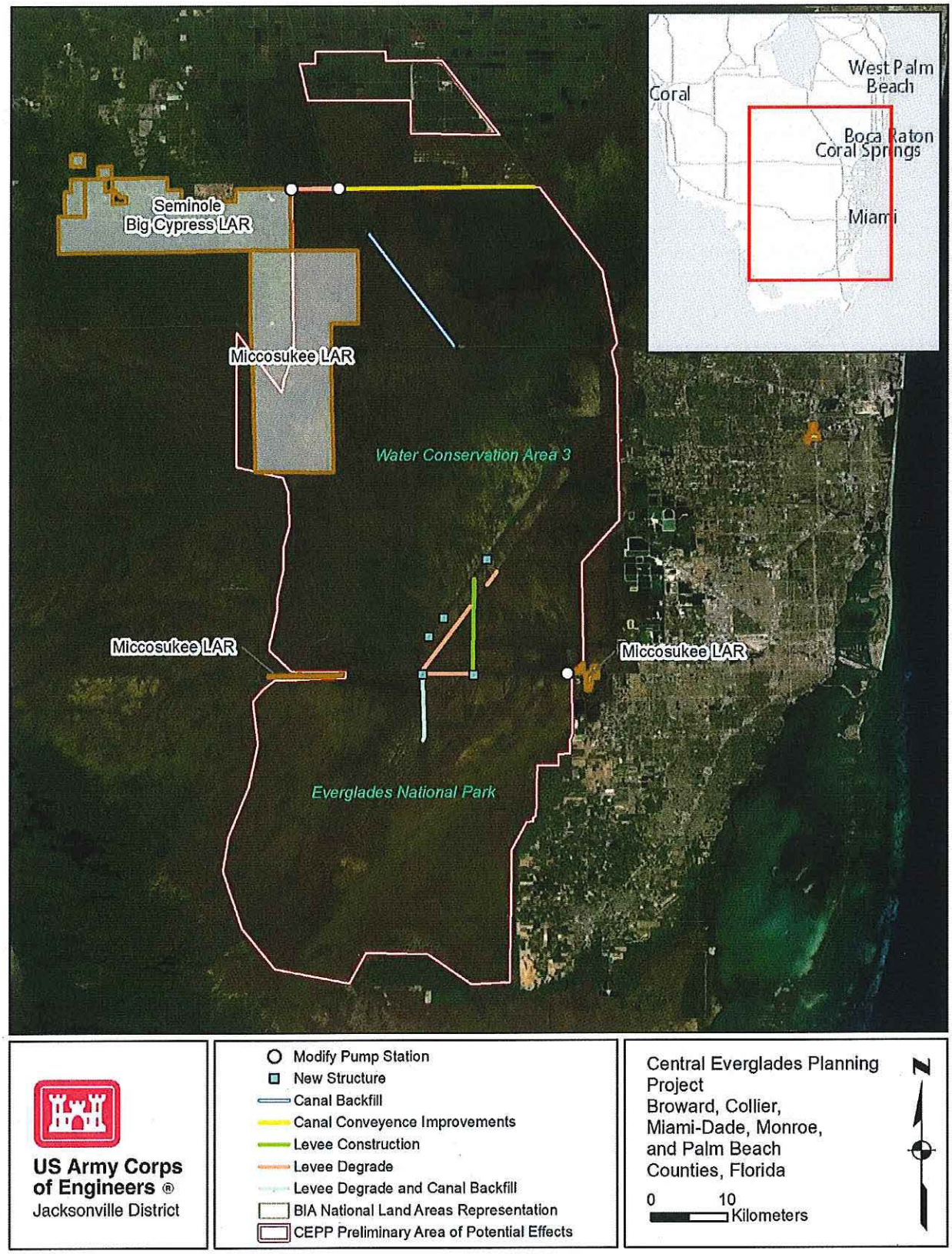

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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-8915

Planning and Policy Division
Environmental Branch

MAR 30 2020

David Frank
Tribal Historic Preservation Officer
Seminole Nation of Oklahoma
P.O. Box 1498
Wewoka, OK 74884

Re: Central Everglades Planning Project Cultural Resources Working Group and CEPP South Programmatic Agreement

Dear Mr. Frank:

The U.S. Army Corps of Engineers, Jacksonville District (Corps), is planning to implement the Central Everglades Planning Project (CEPP), as authorized by Congress under P.L 144-322 Water Infrastructure Improvements (WIIN) Act of 2016. The purpose of this letter is to formally invite participation in the CEPP Cultural Resources Working Group (Working Group) and invite participation as a Concurring Party in the development of a Programmatic Agreement for CEPP South. The CEPP is a multi-component subset of Comprehensive Everglades Restoration Plan projects intended to improve the quality, timing, duration, and volume of water flowing from Lake Okeechobee to the south, through the Everglades, and out to Florida Bay. The CEPP has been divided into three components, based on geography and scope (Figure 1). CEPP North consists of construction features on the northern end of Water Conservation Area 3. CEPP South consists of construction features in the southern portion of Water Conservation Area 3 and the northern portion of Everglades National Park. CEPP New Water includes new storage and treatment features in the Everglades Agricultural Area as well as the final operations manual. The area of potential effects, based on preliminary modeling) for all of the CEPP extends from the Everglades Agricultural Area into Everglades National Park, including state, federal, private, and Native American lands (Figure 2).

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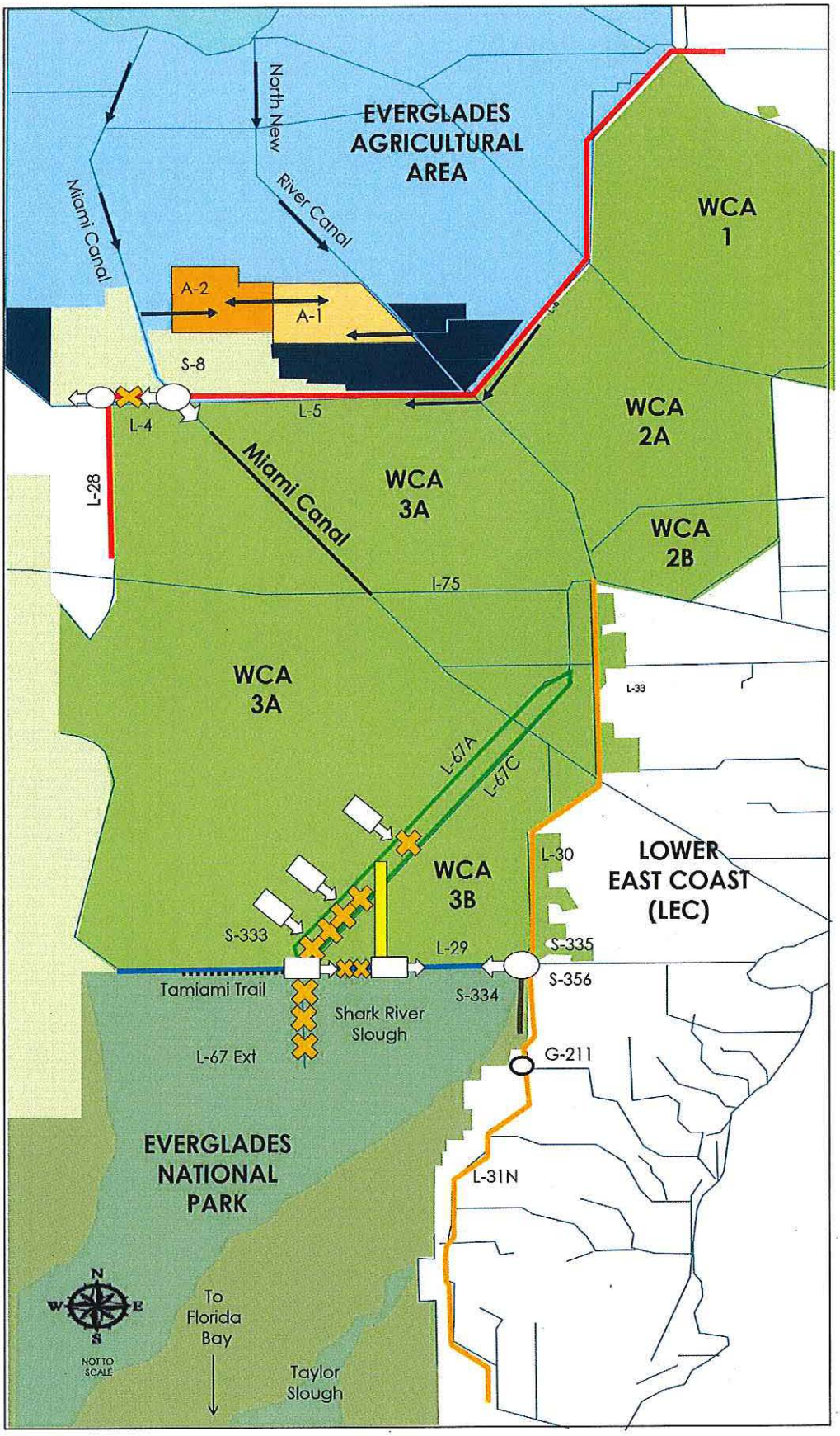
Sincerely,

Angela E. Dunn
Chief, Environmental Branch

Enclosure



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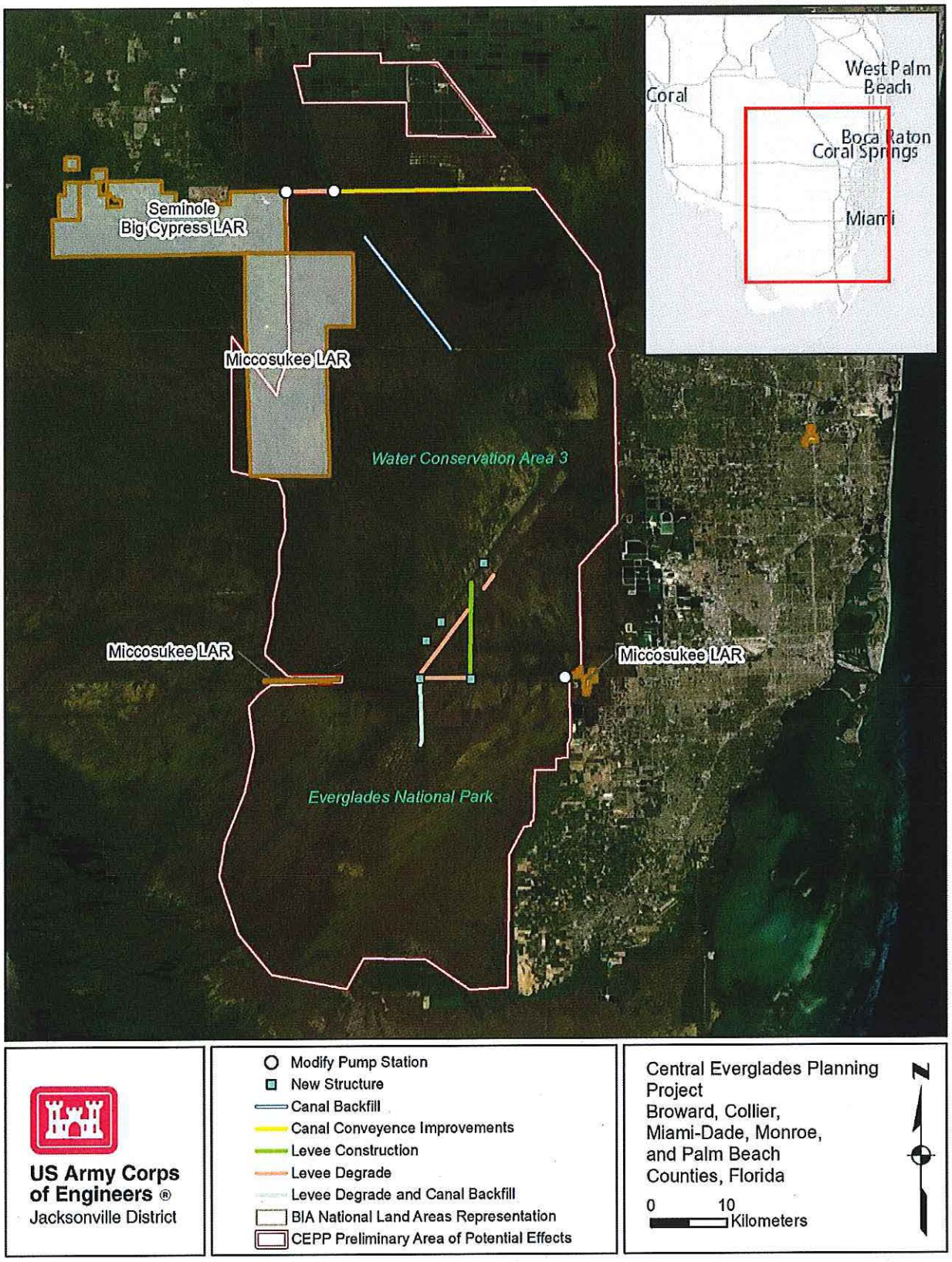

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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-8915

Planning and Policy Division
Environmental Branch

MAR 30 2020

Jane Maylen
Tribal Historic Preservation Officer (acting)
Thlopthlocco Tribal Town
P.O. Box 188
Okemah, OK 74859

Re: Central Everglades Planning Project Cultural Resources Working Group and CEPP South Programmatic Agreement

Dear Ms. Maylen:

The U.S. Army Corps of Engineers, Jacksonville District (Corps), is planning to implement the Central Everglades Planning Project (CEPP), as authorized by Congress under P.L 144-322 Water Infrastructure Improvements (WIIN) Act of 2016. The purpose of this letter is to formally invite participation in the CEPP Cultural Resources Working Group (Working Group) and invite participation as a Concurring Party in the development of a Programmatic Agreement for CEPP South. The CEPP is a multi-component subset of Comprehensive Everglades Restoration Plan projects intended to improve the quality, timing, duration, and volume of water flowing from Lake Okeechobee to the south, through the Everglades, and out to Florida Bay. The CEPP has been divided into three components, based on geography and scope (Figure 1). CEPP North consists of construction features on the northern end of Water Conservation Area 3. CEPP South consists of construction features in the southern portion of Water Conservation Area 3 and the northern portion of Everglades National Park. CEPP New Water includes new storage and treatment features in the Everglades Agricultural Area as well as the final operations manual. The area of potential effects, based on preliminary modeling) for all of the CEPP extends from the Everglades Agricultural Area into Everglades National Park, including state, federal, private, and Native American lands (Figure 2).

The Corps recognizes the scale and scope of CEPP requires ongoing coordination and consultation. The Corps intends the Working Group to serve as a venue to provide information, collaborate, receive feedback, and develop plans for ensuring compliance with Section 106 of the National Historic Preservation Act (NHPA) during the construction of the CEPP. The CEPP is a large and complex project, with intricate dependencies, dozens of features, and broad potential effects. The input from the Working Group will be used by the Corps to determine areas of potential effect, identify historic properties, assess adverse effects to historic properties, and resolve any adverse effects.

The Corps plans to implement a project partnership agreement with the South Florida Water Management District for the design and construction of CEPP South in June 2020. The Corps has begun efforts necessary for the identification of historic properties within portions of CEPP South, but due to unknown locations of project features, the Section 106 of the NHPA Review Process cannot be completed prior to the implementation of this decision document. In order to comply with Section 106 of the NHPA, the Corps proposes to develop a Programmatic Agreement for CEPP South. This agreement will detail that the Corps will complete the Section 106 of the NHPA Review Process for each feature prior to its approval and construction. Based on the schedule for CEPP North and CEPP New Water, the Corps anticipates the Section 106 of the NHPA Review Process will be completed without the need for a Programmatic Agreement.

The Corps requests a response regarding participation in the Working Group and Programmatic Agreement within 30 days. Please contact Mr. Christopher Altes with any question or concerns by email at christopher.f.altes@usace.army.mil or by telephone at (904) 232-1694.

Sincerely,

Angela E. Dunn
Chief, Environmental Branch

Enclosure

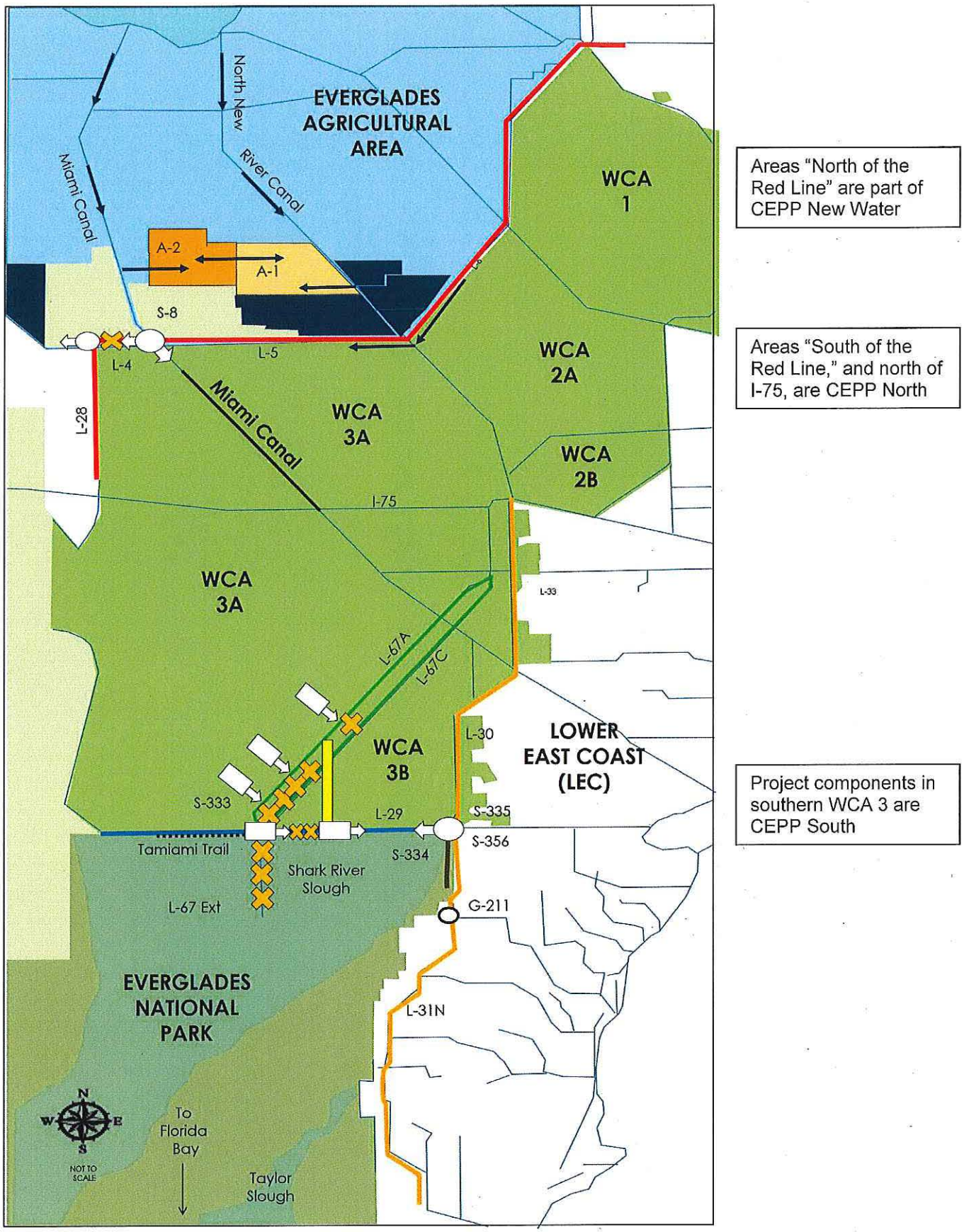

Figure 1. CEPP Features and Components from the 2014 Environmental Impacts Statement

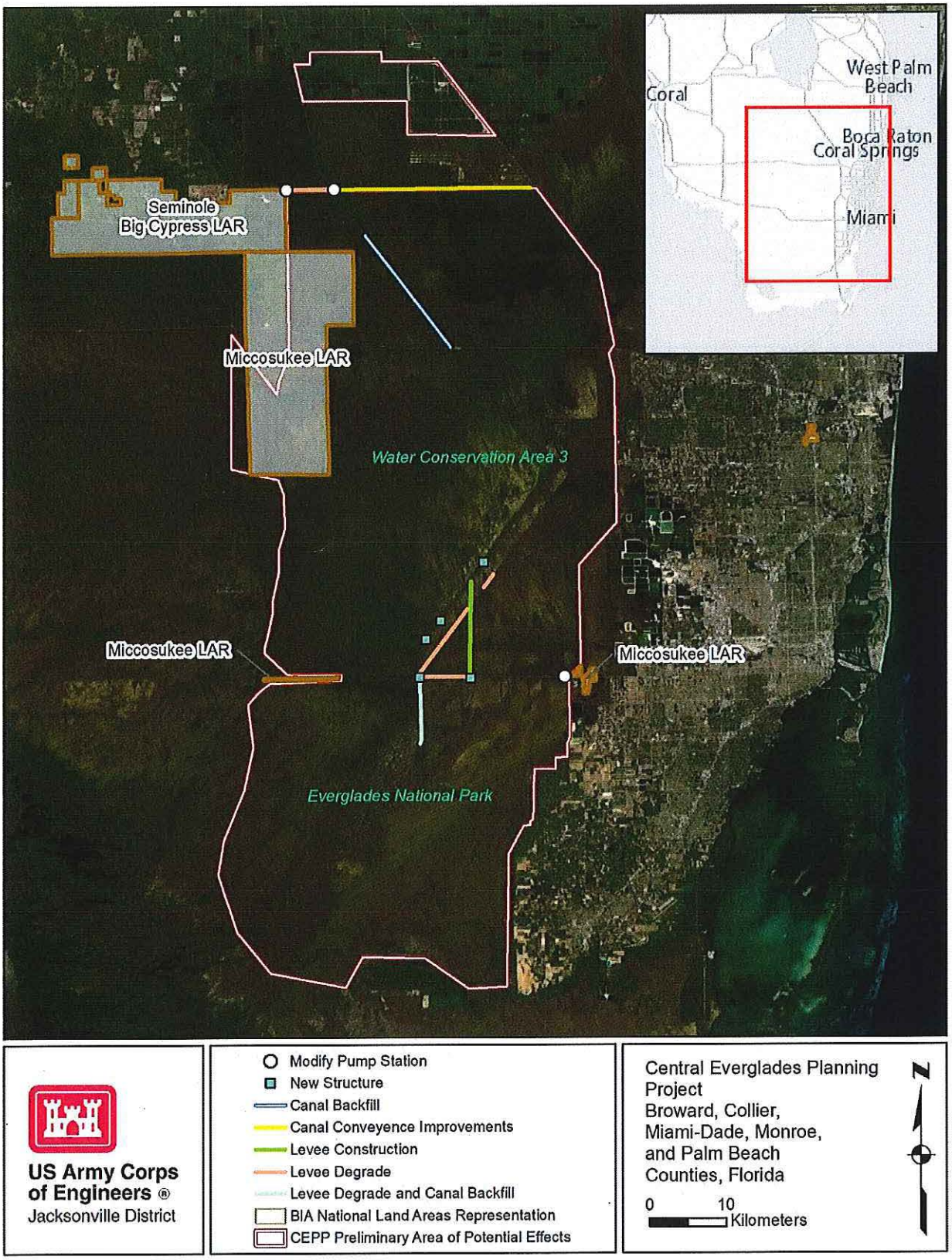

Figure 2. Preliminary CEPP Area of Potential Effects

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-8915

Planning and Policy Division
Environmental Branch

MAR 30 2020

Sarah Cody
Miami-Dade County
Certified Local Government
111 Northwest First Street, Mailbox 114,
Miami, FL 33128

Re: Central Everglades Planning Project Cultural Resources Working Group and CEPP South Programmatic Agreement

Dear Ms. Cody:

The U.S. Army Corps of Engineers, Jacksonville District (Corps), is planning to implement the Central Everglades Planning Project (CEPP), as authorized by Congress under P.L 144-322 Water Infrastructure Improvements (WIIN) Act of 2016. The purpose of this letter is to formally invite participation in the CEPP Cultural Resources Working Group (Working Group) and invite participation as a Consulitng Party in the development of a Programmatic Agreement for CEPP South. The CEPP is a multi-component subset of Comprehensive Everglades Restoration Plan projects intended to improve the quality, timing, duration, and volume of water flowing from Lake Okeechobee to the south, through the Everglades, and out to Florida Bay. The CEPP has been divided into three components, based on geography and scope (Figure 1). CEPP North consists of construction features on the northern end of Water Conservation Area 3. CEPP South consists of construction features in the southern portion of Water Conservation Area 3 and the northern portion of Everglades National Park. CEPP New Water includes new storage and treatment features in the Everglades Agricultural Area as well as the final operations manual. The area of potential effects, based on preliminary modeling) for all of the CEPP extends from the Everglades Agricultural Area into Everglades National Park, including state, federal, private, and Native American lands (Figure 2).

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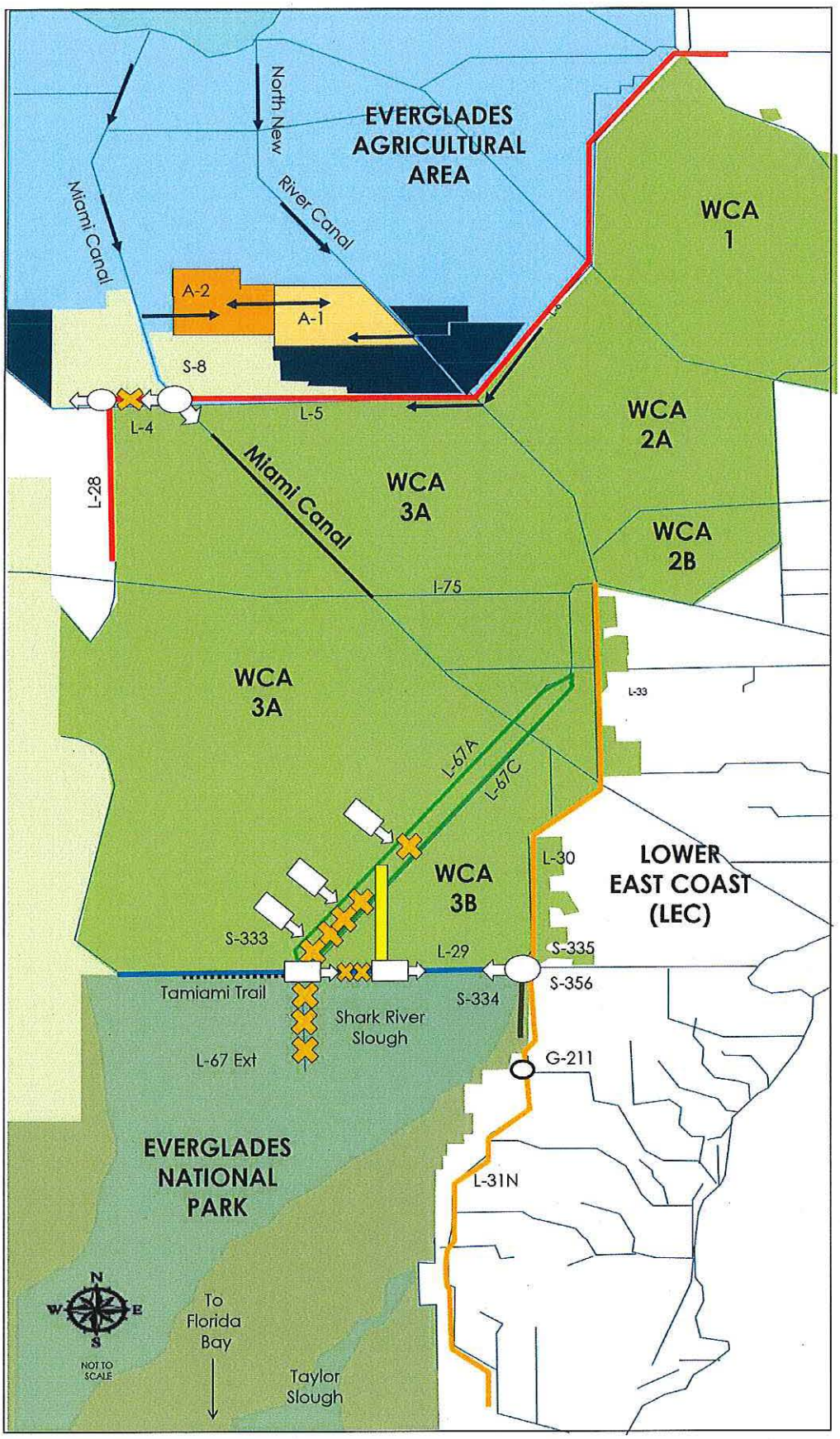
The Corps requests a response regarding participation in the Working Group and Programmatic Agreement within 30 days. Please contact Mr. Christopher Altes with any question or concerns by email at christopher.f.altes@usace.army.mil or by telephone at (904) 232-1694.

Sincerely,

Angela E. Dunn
Chief, Environmental Branch

Enclosure

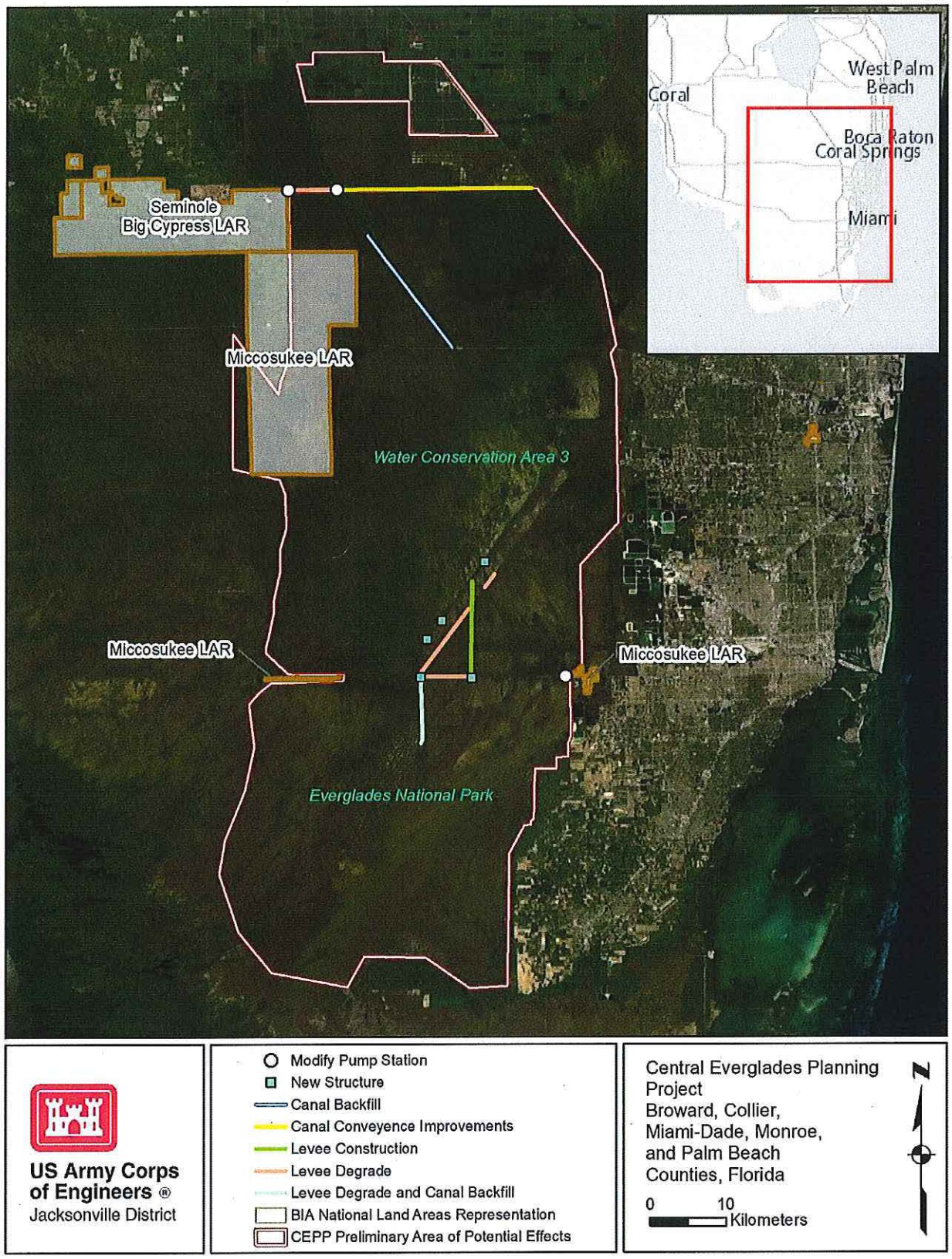


Areas "North of the Red Line" are part of CEPP New Water

Areas "South of the Red Line," and north of I-75, are CEPP North

Project components in southern WCA 3 are CEPP South

Figure 1. CEPP Features and Components from the 2014 Environmental Impacts Statement



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CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-8915

Planning and Policy Division
Environmental Branch

1 May 2020

Tim Parsons, Ph.D.
State Historic Preservation Officer
Florida Division of Historical Resources
500 South Bronough Street
Tallahassee, FL 32399-0250

Re: Central Everglades Planning Project South Phase Contract 1, Dade County, Florida

Dear Dr. Parsons:

The U.S. Army Corps of Engineers, Jacksonville District (Corps), is studying the environmental effects associated with Central Everglades Planning Project (CEPP) South Phase, Contract 1 (CEPP South Contract 1). CEPP South Contract 1 consists of features intended to allow flow from Water Conservation Area (WCA) 3A into WCA 3B. The proposed actions include constructing gated culverts in the L-67A levee, removing spoil piles to grade along the L-67A canal, creating gaps in the L-67C levee, and backfilling a ditch between L-67A and L-67C (Figure 1). The proposed actions are located along the boundary of WCA 3A and WCA 3B in Dade County, Florida. The area of potential effects (APE) for this construction includes the construction footprints with a buffer for staging and access. The proposed features are part of the decompartmentalization of the Everglades and the CEPP goals of improve the quality, timing, duration, and volume of water in South Florida.

The L-67A canal and levee was recorded as resource group 8BD5100 by Panamerican Consultants, Inc. (PCI) in a 2012 report titled “Phase I Historical and Archaeological Survey within WCA-3A, Levee 4-5 Spreader Channel, and Levee 5 Spreader Channel Pump Station, Broward and Dade Counties, Florida” (BAR # 20487). The description and map of resource group 8BD5100 in the PCI report and site file includes the portion of the L-67A canal and levee within the APE; however, no site file number was assigned for the portion in Dade County. The Florida Division of Historical Resource, Appendix E of the “Guide to the Resource Group Form, v. 5.0” (2019), states that typically only older canals (19th century), transportation canals, larger regional canals dug as part of the early 20th century reclamation activities, or canals used in industry are considered eligible for inclusion in the National Register of Historic Places (NRHP). The L-67A canal and levee was constructed in 1961-1962 and is not part of a primary canal or part of the historically significant early attempts to drain and control water in the Everglades; therefore, PCI recommended L-67A as ineligible for listing in the NRHP. The Corps has determined, based on the lack of association with a primary canal, the nondescript and typical character, and lack of association with the earlier phases of control system of South Florida, the L-67A levee is not eligible for listing in the NRHP.

The Corps archaeologist reviewed the locations of the proposed water control structures on historic aerial photography. The newly proposed structures are designed to allow water to pass through the L-67A and are aligned to sloughs visible in 1940s aerials, and not located with potentially buried tree islands (Figure 2).

The spoil piles proposed for removal are associated with the construction of the L-67A levee, and are located across from two of the proposed structures. These spoil piles were created during the dredging of the canal in 1961 and therefore do not contain archaeological materials. Spoil piles were expressly selected that do not correspond with the locations of tree islands on historic aerial photography, but were sited in order to fit with the pattern of sloughs seen on historic aerial photography (see Figure 2). The spoil piles are a byproduct of canal construction, do not correspond with locations of historic tree islands, and do not possess any unique qualities that would make the spoil piles eligible for listing in the NRHP. The Corps removed from consideration of the removal spoil piles in areas identified by a representative of the Miccosukee Tribe of Indians of Florida.

In 2013, New South Associates, Inc. (NSA) completed a cultural resources assessment survey to include the ditch between L-67A and L-67 C that the Corps is currently proposing to backfill, as reported in “Central Everglades Planning Project Cultural Resources Survey of Water Conservation Areas 3A and 3B” (DHR # 20328). This survey documented the ditch as part of the Blue Shanty Canal (8DA12826). The Corps determined this resource was ineligible for listing in the NRHP in 2013, with SHPO concurrence. The locations selected for backfill do not correspond with any tree islands on historic aerial photography (see Figure 2).

NSA also surveyed the L-67C canal in 2013, and recorded the canal in the report as resource group 8BD4994 and 8DA13014. Though these site file numbers have been assigned, there is no entry in the Florida Master Site File. This is likely because this resource was not fifty years old at the time of the report, having been constructed in 1965-1966. This resource was recorded and evaluated in anticipation of the potential lag between survey and the current action. The L-67C is not associated with a primary canal or the early attempts to drain and control water in the Everglades. The levee exhibits a nondescript and typical character and is a late addition to the water control system of South Florida, and does not exhibit qualities indicating it would be eligible for listing in the National Register of Historic Places (NSA 2013: 363). The Corps has determined this resource is not eligible for listing in the NRHP. The locations of proposed degrading to create gaps correspond with historic sloughs (see Figure 2).

CEPP South Contract 1 does not include new volumes of water, but will spread the locations of water transported between WCA 3A and WCA 3B. The design is intended to put water in locations that were historically sloughs. The schedule and total volume of water will not change as a result of CEPP South Contract 1. Currently, water enters WCA 3B from

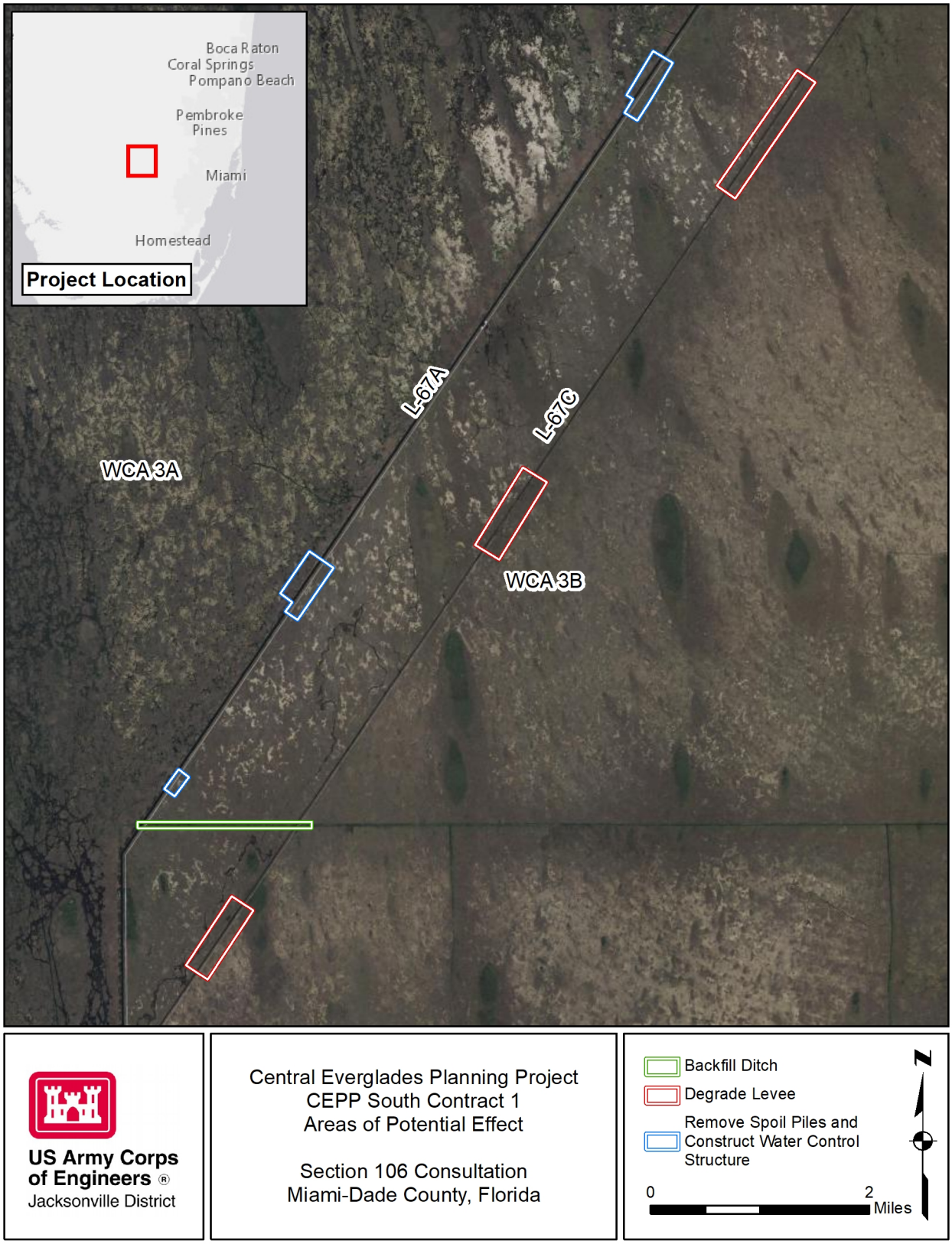
S-151, a gated structure on the north side of this compartmentalized area, with seepage through the L-67A and L-67C levees. The change to a more distributed water flow from existing conditions is not a potential adverse effect to historic properties and provide beneficial effects to tree islands.

The potential effects for this action include disturbance of the direct construction footprints and the alteration of water flow. The Corps has determined the proposed actions of CEPP South Contract 1 will not adversely affect any historic properties. The canals, levees, ditch, and spoil islands are not cultural resources eligible for listing in the NRHP. The design of the project took the historic locations of tree islands and sloughs into account in order to reduce potential impacts to cultural resources. Pursuant to Section 106 of the Nation Historic Preservation Act (54 U.S.C. § 306108) and respective implementing regulations (36 CFR § 800), the Corps kindly requests comments on this determination within 30 days from the receipt of this letter. Please provide comments or questions to Chris Altes by telephone at 904-232-1694 or by email to christopher.f.altes@usace.army.mil.

Sincerely,

Angela E. Dunn
Chief, Environmental Branch

Encl



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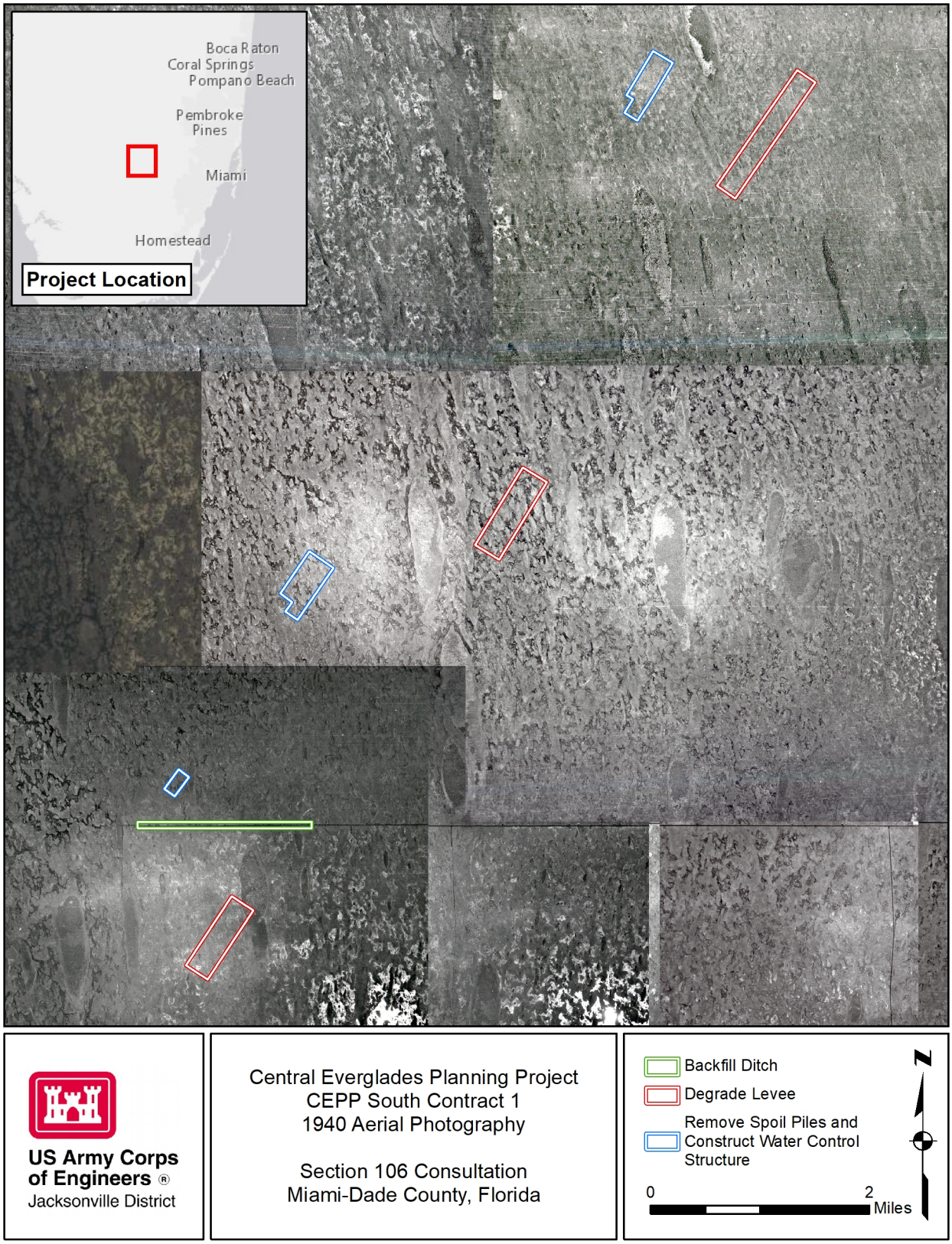

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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-8915

Planning and Policy Division
Environmental Branch

1 May 2020

Kevin Donaldson
NAGPRA Representative
Miccosukee Tribe of Indians of Florida
P.O. Box 440021
Tamiami Station
Miami, FL 33144

Re: Central Everglades Planning Project South Phase Contract 1, Dade County, Florida

Dear Mr. Donaldson:

The U.S. Army Corps of Engineers, Jacksonville District (Corps), is studying the environmental effects associated with Central Everglades Planning Project (CEPP) South Phase, Contract 1 (CEPP South Contract 1). CEPP South Contract 1 consists of features intended to allow flow from Water Conservation Area (WCA) 3A into WCA 3B. The proposed actions include constructing gated culverts in the L-67A levee, removing spoil piles to grade along the L-67A canal, creating gaps in the L-67C levee, and backfilling a ditch between L-67A and L-67C (Figure 1). The proposed actions are located along the boundary of WCA 3A and WCA 3B in Dade County, Florida. The area of potential effects (APE) for this construction includes the construction footprints with a buffer for staging and access. The proposed features are part of the decompartmentalization of the Everglades and the CEPP goals of improve the quality, timing, duration, and volume of water in South Florida.

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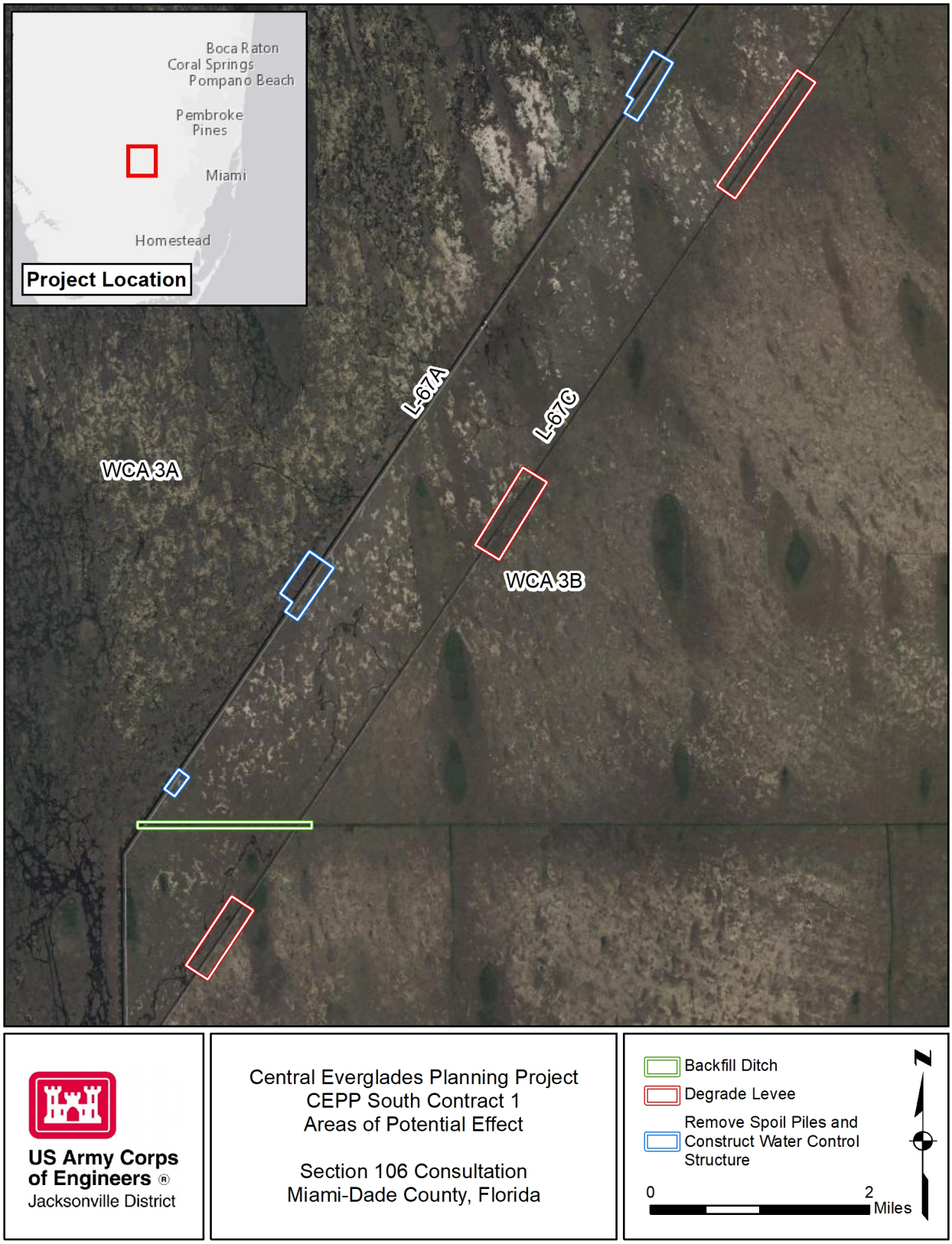
Sincerely,

Angela E. Dunn
Chief, Environmental Branch

Encl



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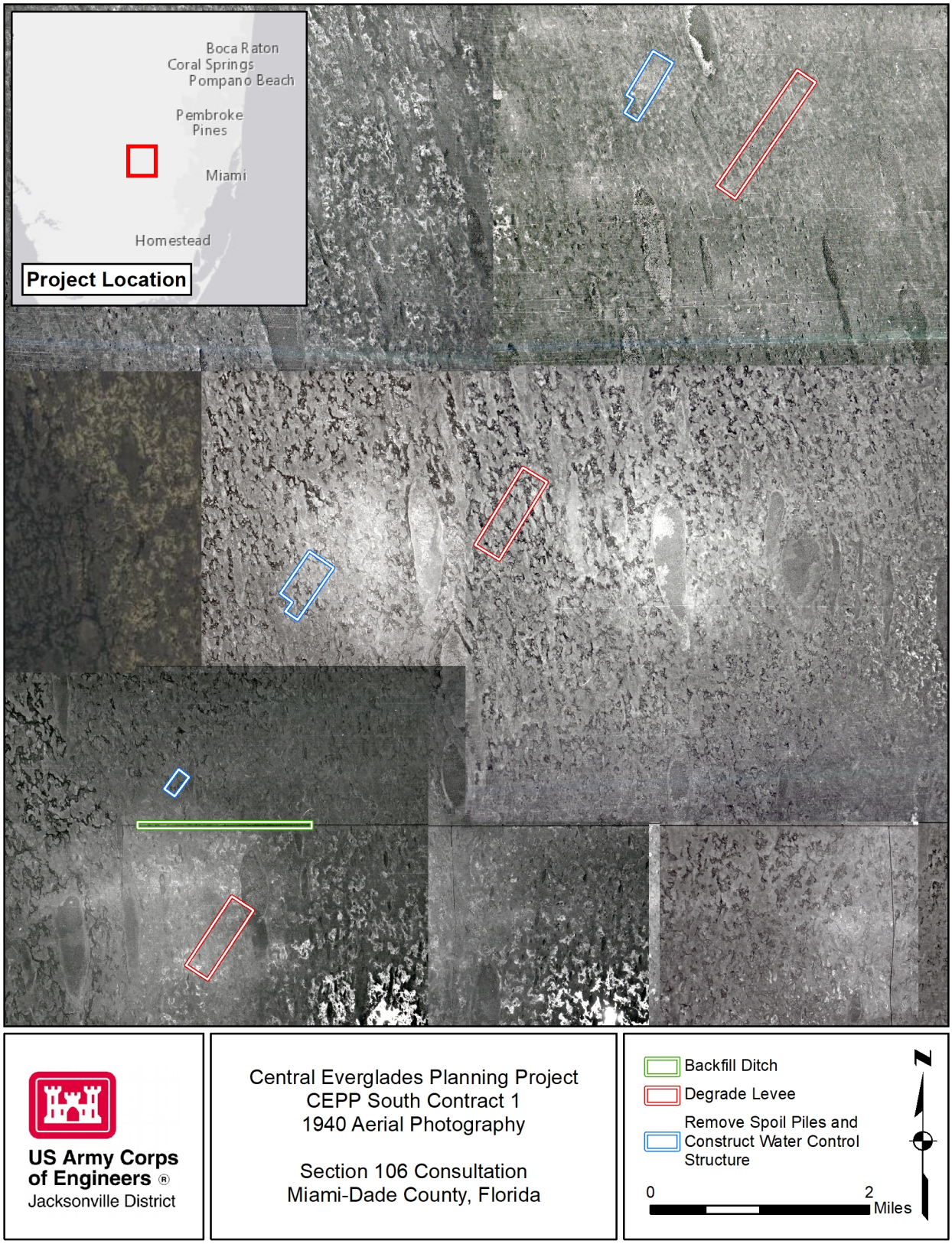

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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-8915

Planning and Policy Division
Environmental Branch

1 May 2020

Paul Backhouse, Ph.D.
Tribal Historic Preservation Officer
Seminole Tribe of Florida
Ah Tah Thi Ki Museum
30290 Josie Billie Hwy., PMB 1004
Clewiston, FL 33440

Re: Central Everglades Planning Project South Phase Contract 1, Dade County, Florida

Dear Dr. Backhouse:

The U.S. Army Corps of Engineers, Jacksonville District (Corps), is studying the environmental effects associated with Central Everglades Planning Project (CEPP) South Phase, Contract 1 (CEPP South Contract 1). CEPP South Contract 1 consists of features intended to allow flow from Water Conservation Area (WCA) 3A into WCA 3B. The proposed actions include constructing gated culverts in the L-67A levee, removing spoil piles to grade along the L-67A canal, creating gaps in the L-67C levee, and backfilling a ditch between L-67A and L-67C (Figure 1). The proposed actions are located along the boundary of WCA 3A and WCA 3B in Dade County, Florida. The area of potential effects (APE) for this construction includes the construction footprints with a buffer for staging and access. The proposed features are part of the decompartmentalization of the Everglades and the CEPP goals of improve the quality, timing, duration, and volume of water in South Florida.

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Angela E. Dunn
Chief, Environmental Branch

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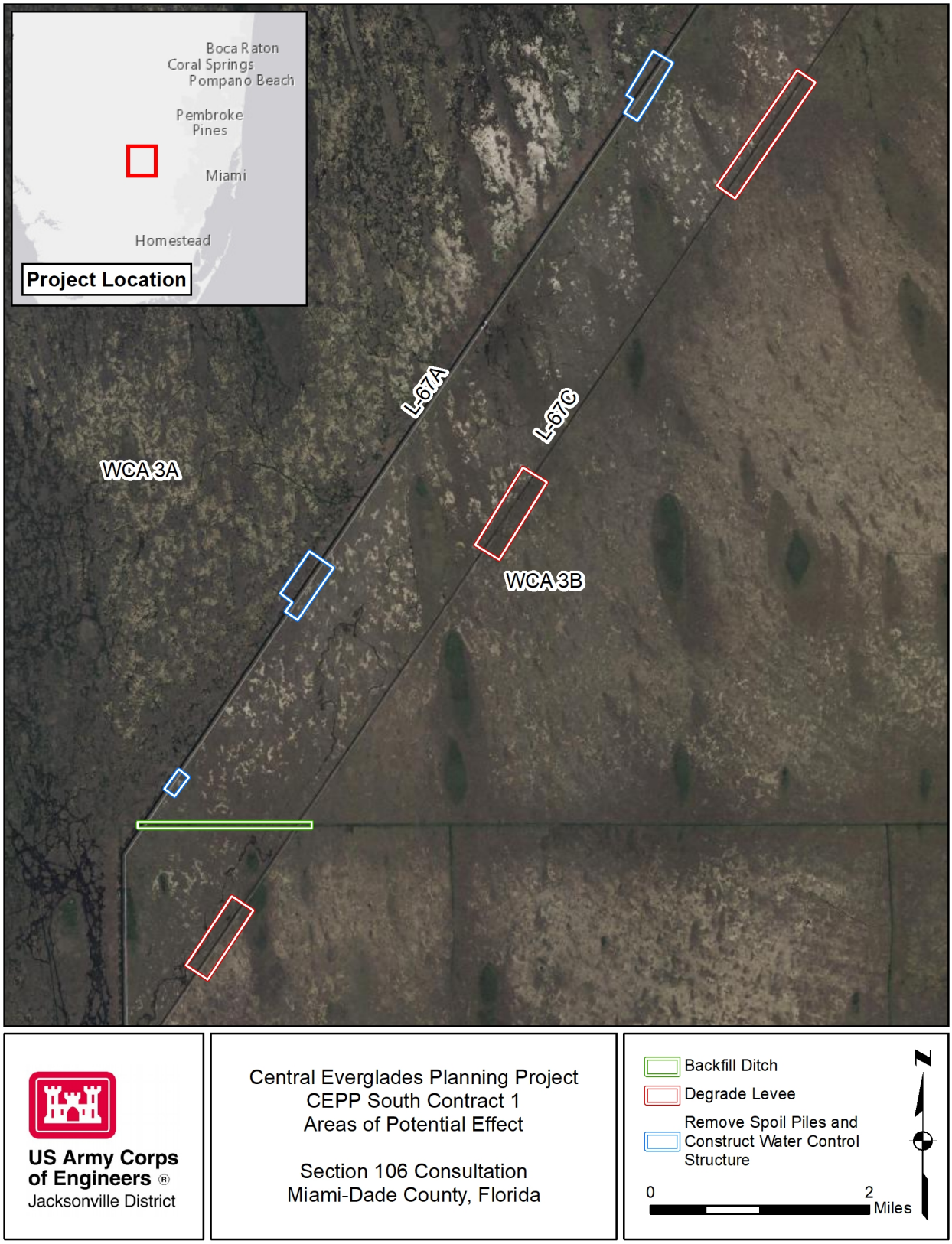

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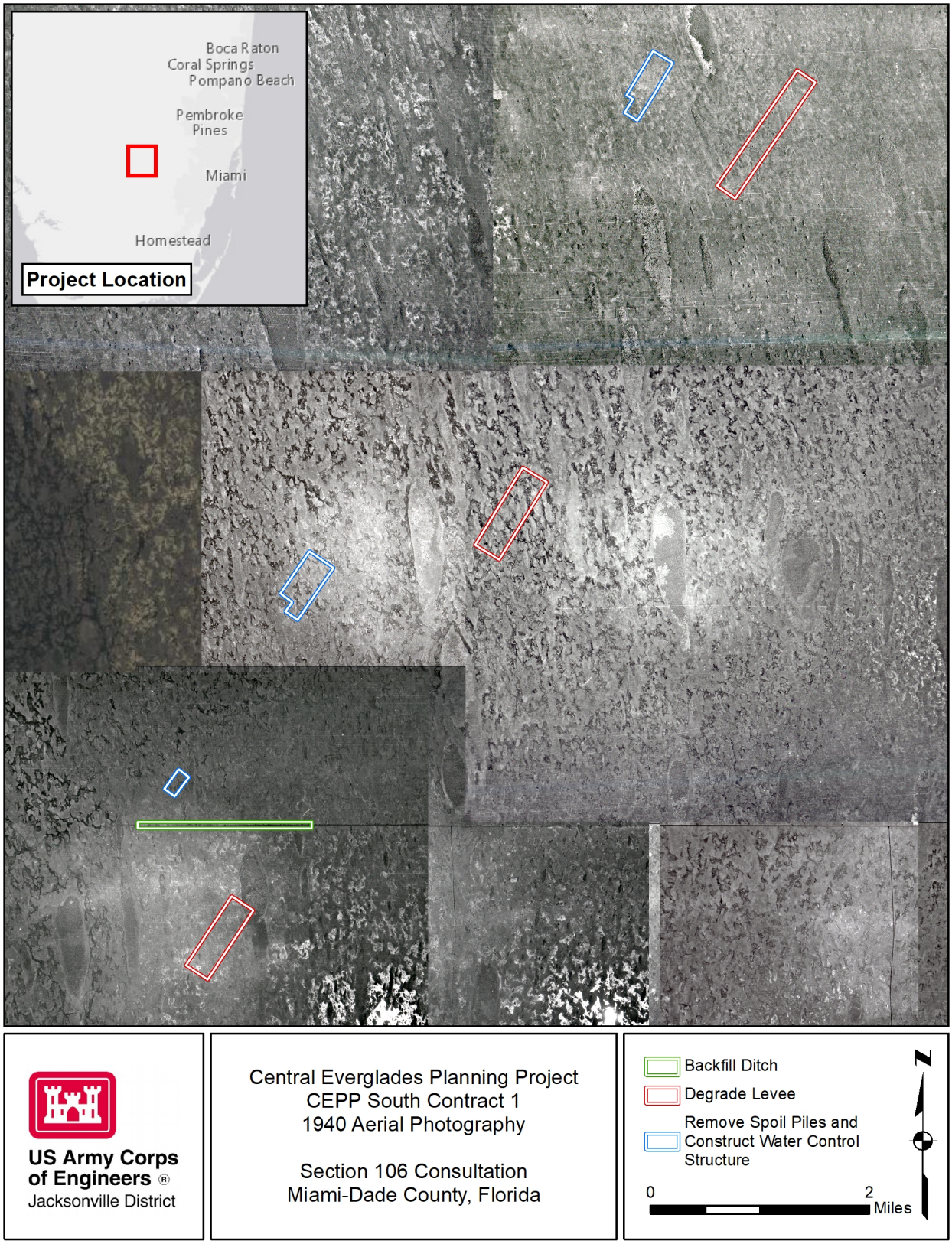

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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-8915

Planning and Policy Division
Environmental Branch

1 May 2020

David Frank
Tribal Historic Preservation Officer
Seminole Nation of Oklahoma
P.O. Box 1498
Wewoka, OK 74884

Re: Central Everglades Planning Project South Phase Contract 1, Dade County, Florida

Dear Mr. Frank:

The U.S. Army Corps of Engineers, Jacksonville District (Corps), is studying the environmental effects associated with Central Everglades Planning Project (CEPP) South Phase, Contract 1 (CEPP South Contract 1). CEPP South Contract 1 consists of features intended to allow flow from Water Conservation Area (WCA) 3A into WCA 3B. The proposed actions include constructing gated culverts in the L-67A levee, removing spoil piles to grade along the L-67A canal, creating gaps in the L-67C levee, and backfilling a ditch between L-67A and L-67C (Figure 1). The proposed actions are located along the boundary of WCA 3A and WCA 3B in Dade County, Florida. The area of potential effects (APE) for this construction includes the construction footprints with a buffer for staging and access. The proposed features are part of the decompartmentalization of the Everglades and the CEPP goals of improve the quality, timing, duration, and volume of water in South Florida.

The L-67A canal and levee was recorded as resource group 8BD5100 by Panamerican Consultants, Inc. (PCI) in a 2012 report titled “Phase I Historical and Archaeological Survey within WCA-3A, Levee 4-5 Spreader Channel, and Levee 5 Spreader Channel Pump Station, Broward and Dade Counties, Florida” (BAR # 20487). The description and map of resource group 8BD5100 in the PCI report and site file includes the portion of the L-67A canal and levee within the APE; however, no site file number was assigned for the portion in Dade County. The Florida Division of Historical Resource, Appendix E of the “Guide to the Resource Group Form, v. 5.0” (2019), states that typically only older canals (19th century), transportation canals, larger regional canals dug as part of the early 20th century reclamation activities, or canals used in industry are considered eligible for inclusion in the National Register of Historic Places (NRHP). The L-67A canal and levee was constructed in 1961-1962 and is not part of a primary canal or part of the historically significant early attempts to drain and control water in the Everglades; therefore, PCI recommended L-67A as ineligible for listing in the NRHP. The Corps has determined, based on the lack of association with a primary canal, the nondescript and typical character, and lack of association with the earlier phases of control system of South Florida, the L-67A levee is not eligible for listing in the NRHP.

The Corps archaeologist reviewed the locations of the proposed water control structures on historic aerial photography. The newly proposed structures are designed to allow water to pass through the L-67A and are aligned to sloughs visible in 1940s aerials, and not located with potentially buried tree islands (Figure 2).

The spoil piles proposed for removal are associated with the construction of the L-67A levee, and are located across from two of the proposed structures. These spoil piles were created during the dredging of the canal in 1961 and therefore do not contain archaeological materials. Spoil piles were expressly selected that do not correspond with the locations of tree islands on historic aerial photography, but were sited in order to fit with the pattern of sloughs seen on historic aerial photography (see Figure 2). The spoil piles are a byproduct of canal construction, do not correspond with locations of historic tree islands, and do not possess any unique qualities that would make the spoil piles eligible for listing in the NRHP. The Corps removed from consideration of the removal spoil piles in areas identified by a representative of the Miccosukee Tribe of Indians of Florida.

In 2013, New South Associates, Inc. (NSA) completed a cultural resources assessment survey to include the ditch between L-67A and L-67 C that the Corps is currently proposing to backfill, as reported in “Central Everglades Planning Project Cultural Resources Survey of Water Conservation Areas 3A and 3B” (DHR # 20328). This survey documented the ditch as part of the Blue Shanty Canal (8DA12826). The Corps determined this resource was ineligible for listing in the NRHP in 2013, with SHPO concurrence. The locations selected for backfill do not correspond with any tree islands on historic aerial photography (see Figure 2).

NSA also surveyed the L-67C canal in 2013, and recorded the canal in the report as resource group 8BD4994 and 8DA13014. Though these site file numbers have been assigned, there is no entry in the Florida Master Site File. This is likely because this resource was not fifty years old at the time of the report, having been constructed in 1965-1966. This resource was recorded and evaluated in anticipation of the potential lag between survey and the current action. The L-67C is not associated with a primary canal or the early attempts to drain and control water in the Everglades. The levee exhibits a nondescript and typical character and is a late addition to the water control system of South Florida, and does not exhibit qualities indicating it would be eligible for listing in the National Register of Historic Places (NSA 2013: 363). The Corps has determined this resource is not eligible for listing in the NRHP. The locations of proposed degrading to create gaps correspond with historic sloughs (see Figure 2).

CEPP South Contract 1 does not include new volumes of water, but will spread the locations of water transported between WCA 3A and WCA 3B. The design is intended to put water in locations that were historically sloughs. The schedule and total volume of water will not change as a result of CEPP South Contract 1. Currently, water enters WCA 3B from

S-151, a gated structure on the north side of this compartmentalized area, with seepage through the L-67A and L-67C levees. The change to a more distributed water flow from existing conditions is not a potential adverse effect to historic properties and provide beneficial effects to tree islands.

The potential effects for this action include disturbance of the direct construction footprints and the alteration of water flow. The Corps has determined the proposed actions of CEPP South Contract 1 will not adversely affect any historic properties. The canals, levees, ditch, and spoil islands are not cultural resources eligible for listing in the NRHP. The design of the project took the historic locations of tree islands and sloughs into account in order to reduce potential impacts to cultural resources. Pursuant to Section 106 of the Nation Historic Preservation Act (54 U.S.C. § 306108) and respective implementing regulations (36 CFR § 800), the Corps kindly requests comments on this determination within 30 days from the receipt of this letter. Please provide comments or questions to Chris Altes by telephone at 904-232-1694 or by email to christopher.f.altes@usace.army.mil.

Sincerely,

Angela E. Dunn
Chief, Environmental Branch

Encl

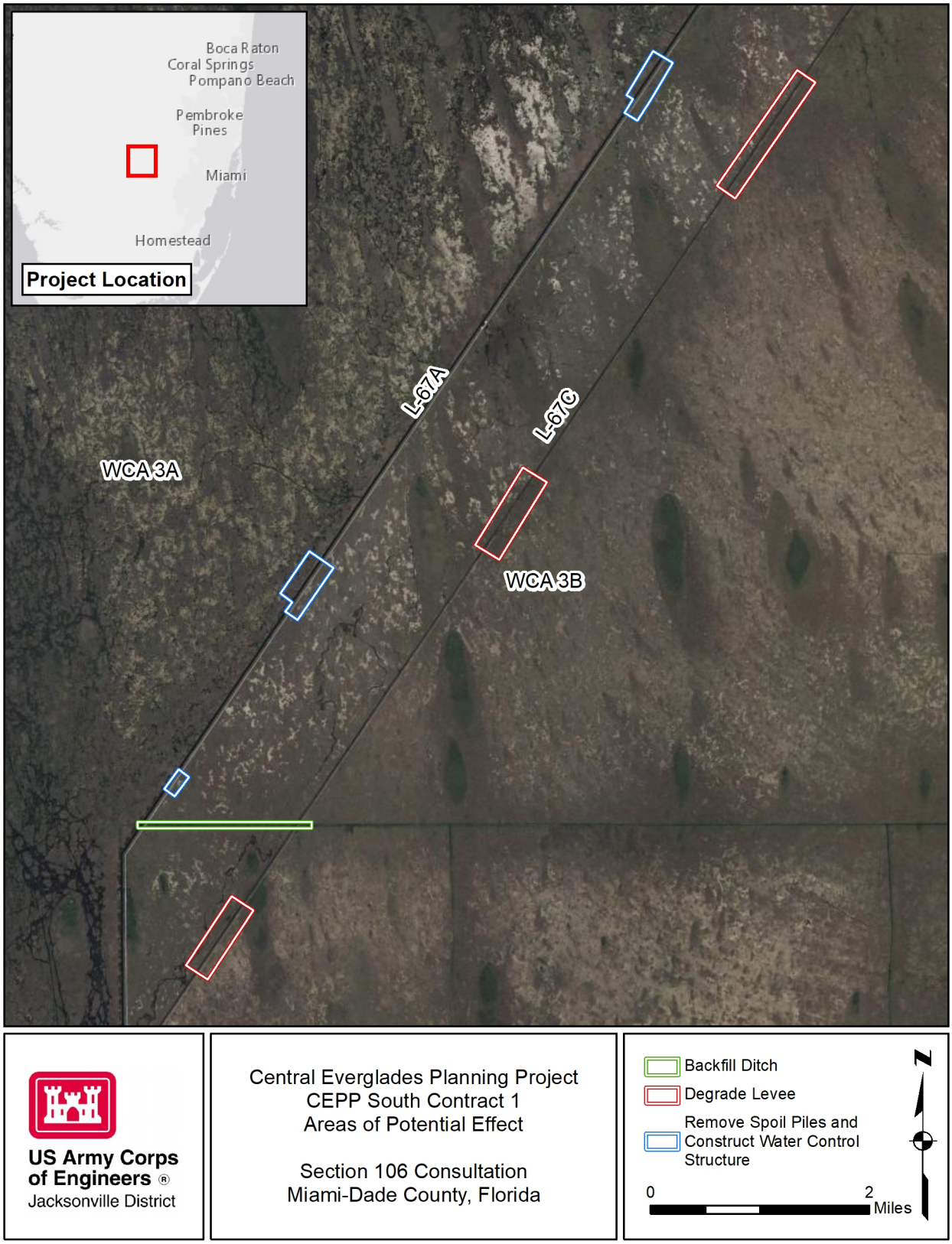


Figure 1. The area of potential effects for the proposed CEPP South Contract 1 Features.

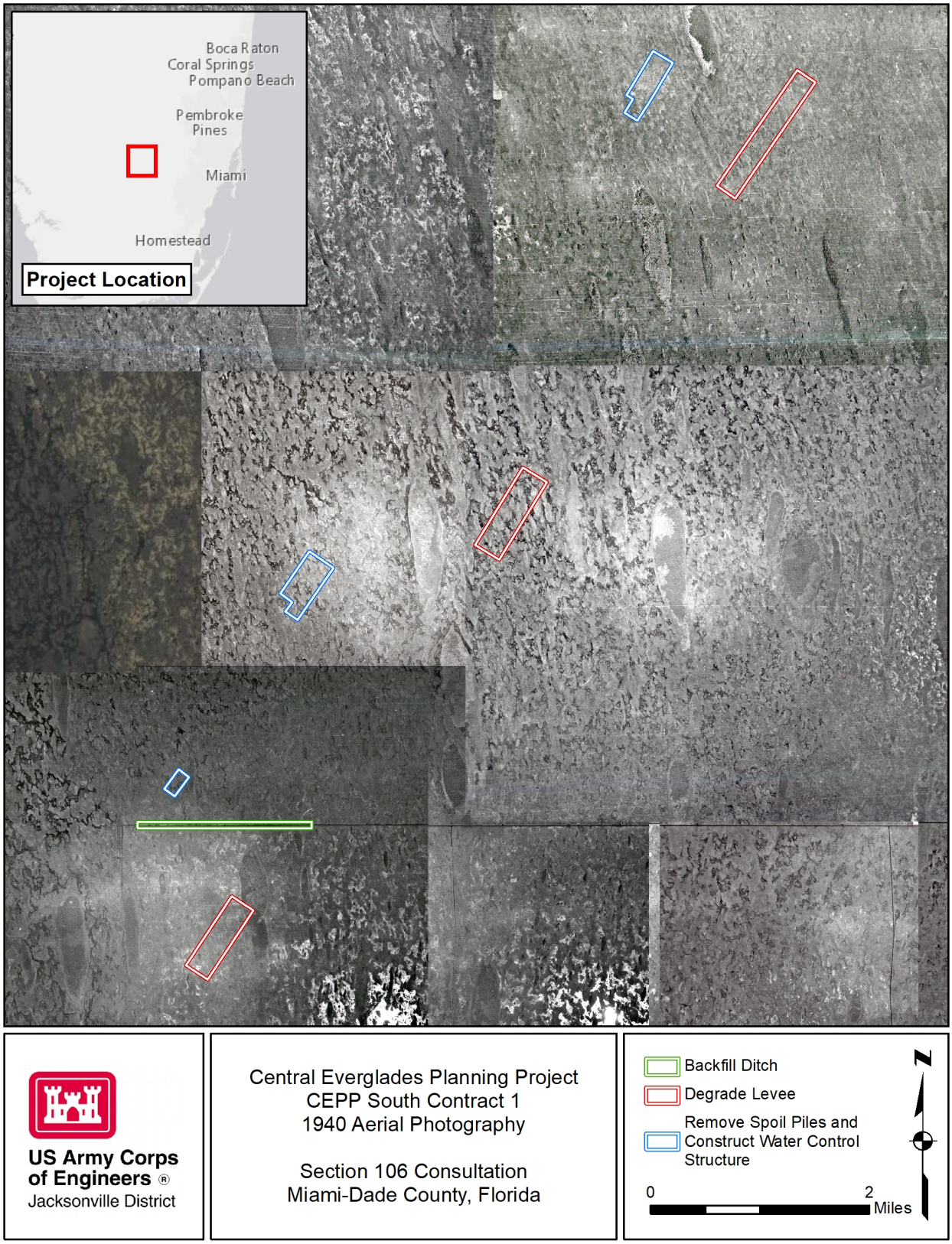


Figure 2. The CEPP South Contract 1 features shown on 1940 aerial photography.

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-8915

Planning and Policy Division
Environmental Branch

1 May 2020

Jane Maylen
Tribal Historic Preservation Officer (acting)
Thlopthlocco Tribal Town
P.O. Box 188
Okemah, OK 74859

Re: Central Everglades Planning Project South Phase Contract 1, Dade County, Florida

Dear Ms. Maylen:

The U.S. Army Corps of Engineers, Jacksonville District (Corps), is studying the environmental effects associated with Central Everglades Planning Project (CEPP) South Phase, Contract 1 (CEPP South Contract 1). CEPP South Contract 1 consists of features intended to allow flow from Water Conservation Area (WCA) 3A into WCA 3B. The proposed actions include constructing gated culverts in the L-67A levee, removing spoil piles to grade along the L-67A canal, creating gaps in the L-67C levee, and backfilling a ditch between L-67A and L-67C (Figure 1). The proposed actions are located along the boundary of WCA 3A and WCA 3B in Dade County, Florida. The area of potential effects (APE) for this construction includes the construction footprints with a buffer for staging and access. The proposed features are part of the decompartmentalization of the Everglades and the CEPP goals of improve the quality, timing, duration, and volume of water in South Florida.

The L-67A canal and levee was recorded as resource group 8BD5100 by Panamerican Consultants, Inc. (PCI) in a 2012 report titled “Phase I Historical and Archaeological Survey within WCA-3A, Levee 4-5 Spreader Channel, and Levee 5 Spreader Channel Pump Station, Broward and Dade Counties, Florida” (BAR # 20487). The description and map of resource group 8BD5100 in the PCI report and site file includes the portion of the L-67A canal and levee within the APE; however, no site file number was assigned for the portion in Dade County. The Florida Division of Historical Resource, Appendix E of the “Guide to the Resource Group Form, v. 5.0” (2019), states that typically only older canals (19th century), transportation canals, larger regional canals dug as part of the early 20th century reclamation activities, or canals used in industry are considered eligible for inclusion in the National Register of Historic Places (NRHP). The L-67A canal and levee was constructed in 1961-1962 and is not part of a primary canal or part of the historically significant early attempts to drain and control water in the Everglades; therefore, PCI recommended L-67A as ineligible for listing in the NRHP. The Corps has determined, based on the lack of association with a primary canal, the nondescript and typical character, and lack of association with the earlier phases of control system of South Florida, the L-67A levee is not eligible for listing in the NRHP.

The Corps archaeologist reviewed the locations of the proposed water control structures on historic aerial photography. The newly proposed structures are designed to allow water to pass through the L-67A and are aligned to sloughs visible in 1940s aerials, and not located with potentially buried tree islands (Figure 2).

The spoil piles proposed for removal are associated with the construction of the L-67A levee, and are located across from two of the proposed structures. These spoil piles were created during the dredging of the canal in 1961 and therefore do not contain archaeological materials. Spoil piles were expressly selected that do not correspond with the locations of tree islands on historic aerial photography, but were sited in order to fit with the pattern of sloughs seen on historic aerial photography (see Figure 2). The spoil piles are a byproduct of canal construction, do not correspond with locations of historic tree islands, and do not possess any unique qualities that would make the spoil piles eligible for listing in the NRHP. The Corps removed from consideration of the removal spoil piles in areas identified by a representative of the Miccosukee Tribe of Indians of Florida.

In 2013, New South Associates, Inc. (NSA) completed a cultural resources assessment survey to include the ditch between L-67A and L-67 C that the Corps is currently proposing to backfill, as reported in “Central Everglades Planning Project Cultural Resources Survey of Water Conservation Areas 3A and 3B” (DHR # 20328). This survey documented the ditch as part of the Blue Shanty Canal (8DA12826). The Corps determined this resource was ineligible for listing in the NRHP in 2013, with SHPO concurrence. The locations selected for backfill do not correspond with any tree islands on historic aerial photography (see Figure 2).

NSA also surveyed the L-67C canal in 2013, and recorded the canal in the report as resource group 8BD4994 and 8DA13014. Though these site file numbers have been assigned, there is no entry in the Florida Master Site File. This is likely because this resource was not fifty years old at the time of the report, having been constructed in 1965-1966. This resource was recorded and evaluated in anticipation of the potential lag between survey and the current action. The L-67C is not associated with a primary canal or the early attempts to drain and control water in the Everglades. The levee exhibits a nondescript and typical character and is a late addition to the water control system of South Florida, and does not exhibit qualities indicating it would be eligible for listing in the National Register of Historic Places (NSA 2013: 363). The Corps has determined this resource is not eligible for listing in the NRHP. The locations of proposed degrading to create gaps correspond with historic sloughs (see Figure 2).

CEPP South Contract 1 does not include new volumes of water, but will spread the locations of water transported between WCA 3A and WCA 3B. The design is intended to put water in locations that were historically sloughs. The schedule and total volume of water will not change as a result of CEPP South Contract 1. Currently, water enters WCA 3B from

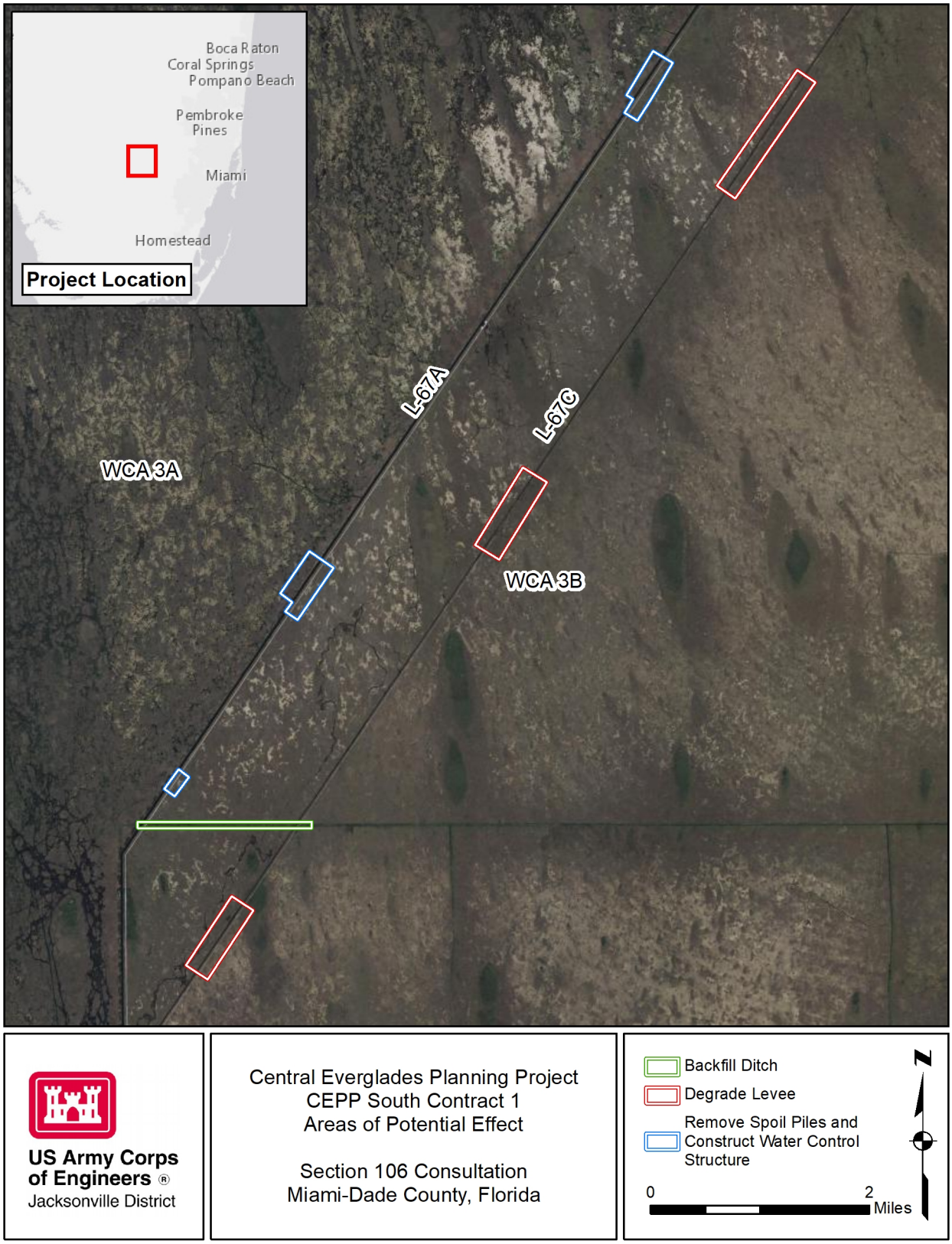
S-151, a gated structure on the north side of this compartmentalized area, with seepage through the L-67A and L-67C levees. The change to a more distributed water flow from existing conditions is not a potential adverse effect to historic properties and provide beneficial effects to tree islands.

The potential effects for this action include disturbance of the direct construction footprints and the alteration of water flow. The Corps has determined the proposed actions of CEPP South Contract 1 will not adversely affect any historic properties. The canals, levees, ditch, and spoil islands are not cultural resources eligible for listing in the NRHP. The design of the project took the historic locations of tree islands and sloughs into account in order to reduce potential impacts to cultural resources. Pursuant to Section 106 of the Nation Historic Preservation Act (54 U.S.C. § 306108) and respective implementing regulations (36 CFR § 800), the Corps kindly requests comments on this determination within 30 days from the receipt of this letter. Please provide comments or questions to Chris Altes by telephone at 904-232-1694 or by email to christopher.f.altes@usace.army.mil.

Sincerely,

Angela E. Dunn
Chief, Environmental Branch

Encl



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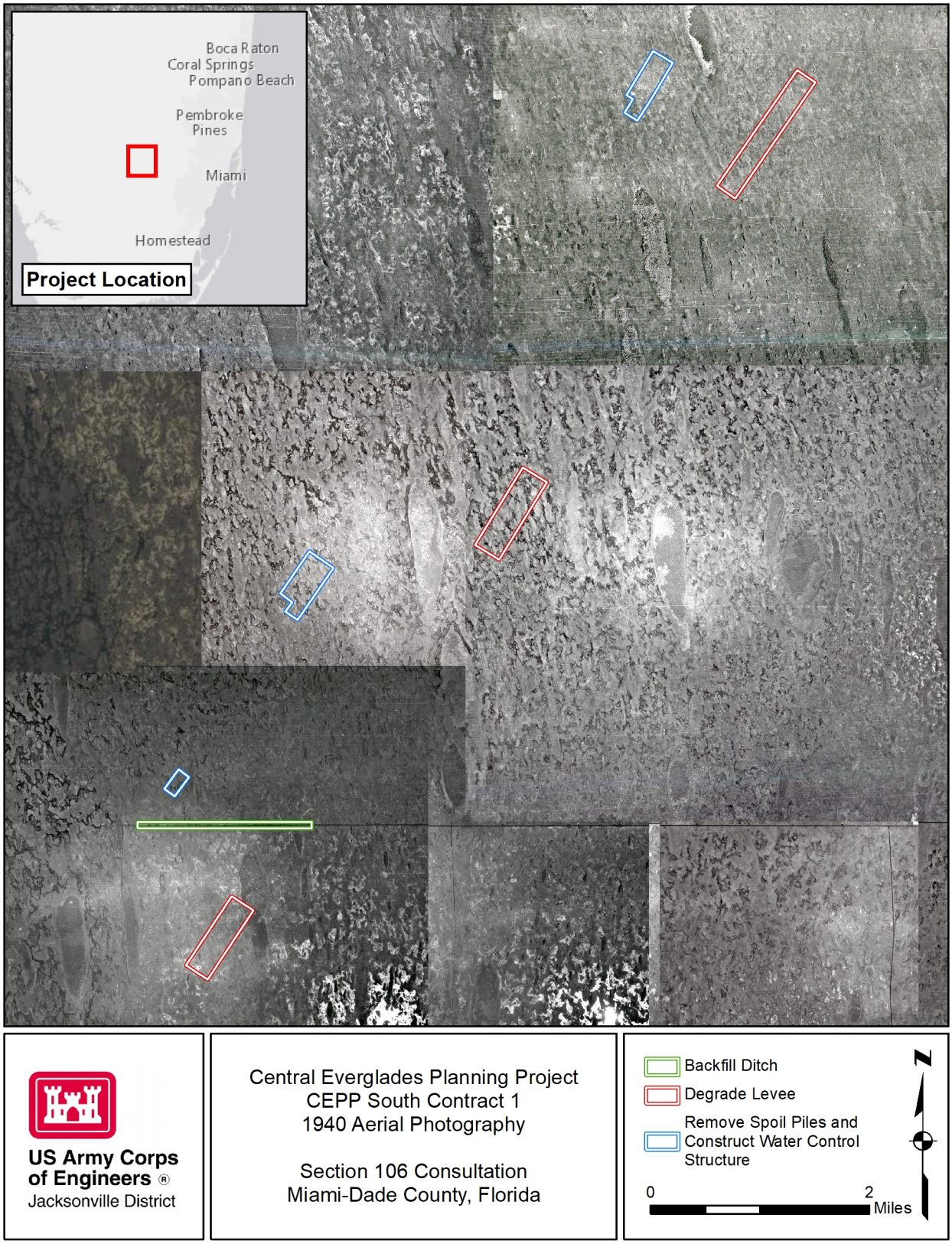

Figure 2. The CEPP South Contract 1 features shown on 1940 aerial photography.

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-8915

Planning and Policy Division
Environmental Branch

1 May 2020

Sarah Cody
Historic Preservation Planner
Miami-Dade County
111 Northwest First Street, Mailbox 114
Miami, FL 33128

Re: Central Everglades Planning Project South Phase Contract 1, Dade County, Florida

Dear Ms. Cody:

The U.S. Army Corps of Engineers, Jacksonville District (Corps), is studying the environmental effects associated with Central Everglades Planning Project (CEPP) South Phase, Contract 1 (CEPP South Contract 1). CEPP South Contract 1 consists of features intended to allow flow from Water Conservation Area (WCA) 3A into WCA 3B. The proposed actions include constructing gated culverts in the L-67A levee, removing spoil piles to grade along the L-67A canal, creating gaps in the L-67C levee, and backfilling a ditch between L-67A and L-67C (Figure 1). The proposed actions are located along the boundary of WCA 3A and WCA 3B in Dade County, Florida. The area of potential effects (APE) for this construction includes the construction footprints with a buffer for staging and access. The proposed features are part of the decompartmentalization of the Everglades and the CEPP goals of improve the quality, timing, duration, and volume of water in South Florida.

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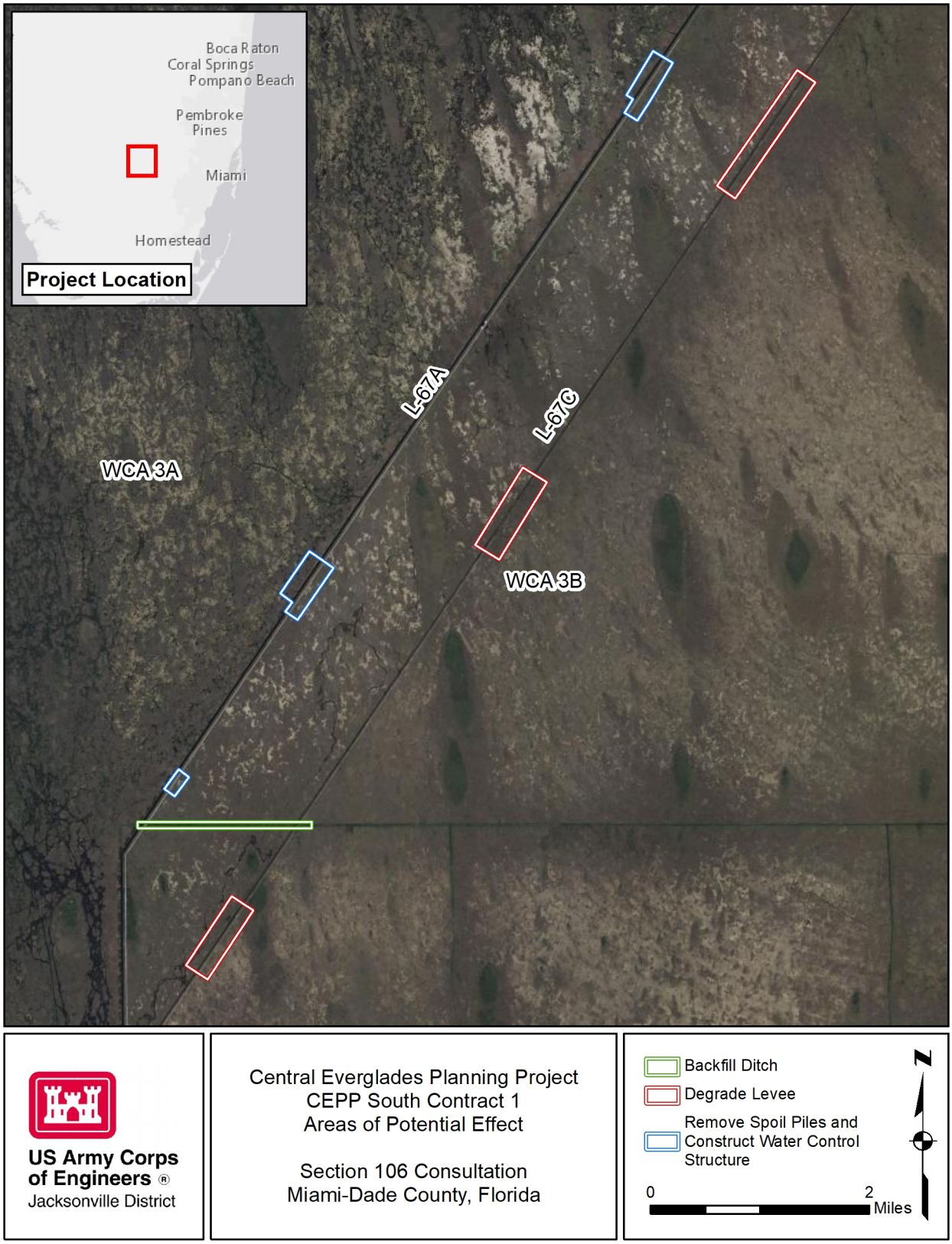

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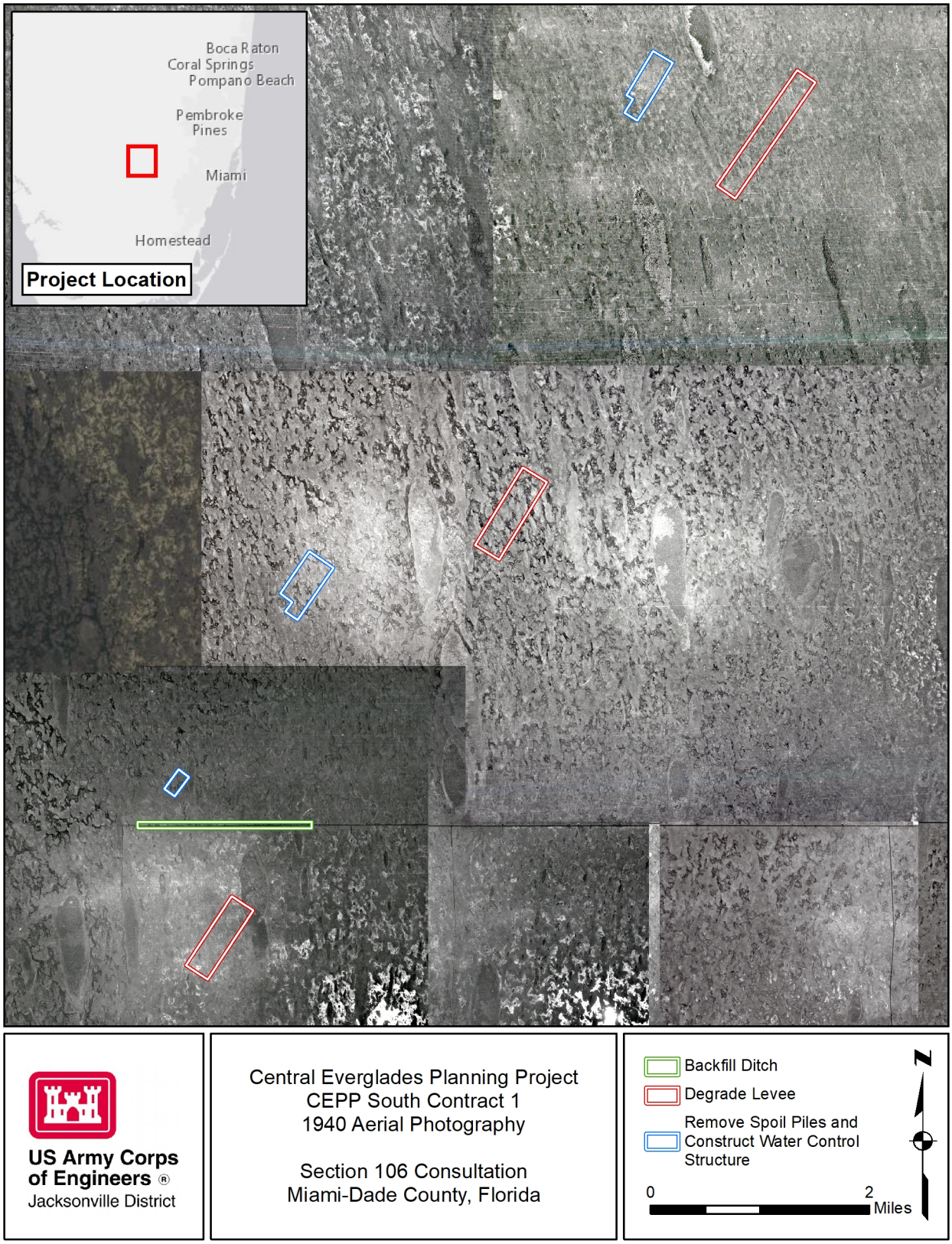

Figure 2. The CEPP South Contract 1 features shown on 1940 aerial photography.