Appendix A

United States Fish and Wildlife Service Coordination – Endangered Species Act

SFWMD Section 203 Everglades Agricultural Area Southern Reservoir and Stormwater Treatment Area

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-0019

Planning and Policy Division
Environmental Branch

May 1, 2018

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 of 1973, as amended, the U.S. Army Corps of Engineers (Corps) is hereby initiating consultation with the U.S. Fish and Wildlife Service (FWS) concerning the South Florida Water Management District (SFWMD) Section 203 Everglades Agricultural Area Southern Reservoir Project. SFWMD prepared a feasibility study and environmental documentation ("study") pursuant to Section 203 of the Water Resources Development Act (WRDA) of 1986 (33 U.S.C. 2231(a)(1)), as amended and submitted this study on March 30, 2018 to the Assistant Secretary of the Army for Civil Works (ASA(CW)) for review in order to determine under 33 U.S.C. 2231(b) whether the study complies with Federal laws and regulations applicable to feasibility studies of water resources development projects. This SFWMD request, if approved, would be a Post Authorization Change Report to modify the Central Everglades Planning Project (CEPP), which was authorized as a Federal project by Congress in 2016. The SFWMD request modifies CEPP features specific to the New Water Project Partnership Agreement (PPA). The SFWMD study was made available to the public on their website at https://www.sfwmd.gov/our-work/cerp-project-planning/eaa-reservoir. The Corps, Jacksonville District has prepared a Biological Assessment that identifies potential effects on listed species pertaining only to the features in the SFWMD Section 203 study that differ from CEPP; namely conversion of the CEPP A-2 Flow Equalization Basin to a deep storage reservoir (A-2 Reservoir), and conversion of 3,000 acres of upland agricultural land to a Stormwater Treatment Area (A2-STA). Species effects determinations for all remaining project components within the proposed SFWMD Section 203 EAA Southern Reservoir and STA Project are the same as outlined within the 2014 CEPP Biological Assessment (USACE 2013) and 2014 CEPP Final Project Implementation Report and Environmental Impact Statement (Corps 2014).

The Corps has determined that the conversion of the CEPP A-2 Flow Equalization Basin to a deep storage reservoir (A-2 Reservoir), and conversion of 6,500 acres of upland agricultural land to a Stormwater Treatment Area (A2-STA) may affect, but is not likely to adversely affect, Audubon's crested caracara (*Caracara cheriway)*, Everglade snail kite *(Rostrhamus sociablis plumbeus)* and wood stork *(Mycteria americana)*. The Corps has also determined that the proposed conversion may affect Eastern indigo snake (*Drymarchon corais couperi*) and Florida panther (*Puma concolor coryi*).

We request the FWS provide concurrence on the Corps species effect determinations, provide a Draft Biological Opinion within 90 days of receipt of this letter for Corps' review and a Final Biological Opinion within 135 days from receipt of this letter. Please contact Stacie Auvenshine by email stacie.J.Auvenshine@usace.army.mil or telephone 904-314-7614 regarding this consultation request.

Sincerely,

Gina Paduano Ralph, Ph.D.
Chief, Environmental Branch

Enclosure

cc:
Mr. Donald Progulske, U.S. Fish and Wildlife Service, 1339 20th Street, Vero Beach, Florida 32960
Mr. Tim Breen, U.S. Fish and Wildlife Service, 1339 20th Street, Vero Beach, Florida 32960

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-0019

REPLY TO
ATTENTION OF

CESAJ-PPD-ES (ER 200-2-2)

MEMORANDUM FOR RECORD

SUBJECT: Fish and Wildlife Coordination Act Report for the Everglades Agricultural Area Southern Reservoir Study (Water Resources Development Act 1986, Section 203)

PURPOSE:

To document an informal understanding between the U.S. Army Corps of Engineers, Jacksonville District, and the U.S. Fish and Wildlife Service, South Florida Ecological Services Field Office.

BACKGROUND:

The South Florida Water Management District (SFWMD) prepared a feasibility study and environmental documentation ("study") pursuant to Section 203 of the Water Resources Development Act (WRDA) of 1986 (33 U.S.C. 2231(a)(1)), as amended. SFWMD submitted this study on March 30, 2018 to the Assistant Secretary of the Army for Civil Works (ASA(CW)) for review in order to determine under 33 U.S.C. 2231(b) whether the study, and the process under which the study was developed, comply with Federal laws and regulations applicable to feasibility studies of water resources development projects. SFWMD made the study available to the public on their website: https://www.sfwmd.gov/our-work/cerp-project-planning/eaa-reservoir. The U.S. Army Corps of Engineers, Jacksonville District (Corps) role in this review is to prepare an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA) to document how the Federal government will evaluate environmental concerns of the SFWMD recommended plan under Section 203 guidance. The SFWMD study has documented their consideration of the potential effects of their proposed activity on the human environment in a manner that was intended to be consistent with NEPA. As such, the SFWMD environmental analysis will be referenced in the Corps' EIS as an appendix. Under Section 203 guidance, the Corps is not involved in a non-Federal Interest's process of the development of alternatives (in this case SFWMD is the non-Federal Interest) and NEPA does not apply to non-federal entities.

CESAJ-PPD-ES (ER 200-2-2)
SUBJECT: Fish and Wildlife Coordination Act Report for the Everglades Agricultural Area Southern Reservoir Study (Water Resources Development Act 1986, Section 203)

The role of the ASA (CW) is to report the results of the Army's evaluation of the SFWMD study on whether the project is feasible and further to report on any recommendations the Secretary of the Army may have concerning the SFWMD's selected plan or project design, and on any conditions the Secretary of the Army may recommend to several congressional committees regarding the construction or design of the project. This request, if approved, would be a Post Authorization Change Report (PACR) to modify the Central Everglades Planning Project (CEPP) features specific to the New Water Project Partnership Agreement (PPA).

The SFWMD has described the purpose of the study as increasing the amount of water storage, treatment and conveyance in CEPP, which was authorized as a federal project by Congress in 2016. The increase in conveyance, storage and treatment provided by the SFWMD proposed project would further reduce discharges from Lake Okeechobee to the Northern Estuaries and send additional water south to the Everglades above and beyond the authorized CEPP.

The SFWMD study identified Alternative C240A as the Tentatively Selected Plan (TSP). The SFWMD determined the TSP to be a cost effective and best buy plan, working towards achieving the overall Comprehensive Everglades Restoration Plan (CERP) goals, and meeting the expressed desires of stakeholders by:

- Decreasing the occurrence and magnitude of undesirable regulatory releases from Lake Okeechobee to the Northern Estuaries
- Increasing flows to the central Everglades by 160,000 acre-feet above the authorized CEPP on an average annual year for a total flow of 370,000 acre-feet

In addition, the SFWMD study reaffirms that the CEPP PPA North and PPA South project features can accommodate the additional flows south to the central Everglades, that would result from additional canal conveyance, storage, and treatment wetlands proposed on lands within the Everglades Agricultural Area.

EVALUATION:

The Corps will produce an EIS in accordance with NEPA to evaluate the SFWMD study process in its decision-making under Section 203. The SFWMD's study has documented their consideration of the effects of their proposed activity on the human environment in a manner that was intended to be consistent with NEPA. The Draft EIS will be submitted for agency and public review in spring 2018 with a Final EIS anticipated by fall of 2018.

CESAJ-PPD-ES (ER 200-2-2)
SUBJECT: Fish and Wildlife Coordination Act Report for the Everglades Agricultural Area Southern Reservoir Study (Water Resources Development Act 1986, Section 203)

The Corps will also produce a Biological Assessment for coordination with the U.S. Fish and Wildlife Service (Service) under the Endangered Species Act of 1973, as amended. The Corps will utilize information provided within the SFWMD study to develop a Biological Assessment for Service review by May 1, 2018 culminating with a final Biological Opinion anticipated within 135 calendar days after submittal.

COORDINATION:

The Fish and Wildlife Coordination Act (FWCA; 16 U.S.C. 661 et seq., March 10, 1934, as amended 1946, 1958, 1978, and 1995) requires federal agencies to consult with the Service regarding potential effects to fish and wildlife resources and the proposed measures to mitigate these effects. Additional coordination authorities exist through the review process of NEPA (42 U.S.C. 4321-4347, January 1, 1970, as amended 1975 and 1982) and the consultations required under ESA of 1973 (7 U.S.C. 136, 16 U.S.C. 1532 et seq. December 28, 1973). The Service will continue to coordinate and consult with the Corps through NEPA and the ESA to ensure potential effects to fish and wildlife resources are adequately addressed via these two authorities. The Service will include comments relevant to the FWCA in the Service's response to the Corps' ESA coordination letter, where applicable. The Corps agrees to maintain open and cooperative communication with the Service during development of the EIS and Biological Opinion for the SFWMD study.

AGREEMENT:

The undersigned, Corps and the Service, agree to utilize the Everglades Agricultural Area Southern Reservoir NEPA review and ESA consultation processes to complete coordination responsibilities under the FWCA. This agreement will avoid duplicated analysis and documentation as authorized under 40 CFR section 1500.4(k), 1502.25, 1506.4, and is consistent with Presidential Executive Order for Improving Regulation and Regulatory Review, released January 18, 2011.

Gina Paduano Ralph, Ph.D.
Chief, Environmental Branch

April 13, 2018
Date

Donald Progulske
Everglades Program Supervisor
South Florida Ecological Services Office

April 23, 2018
Date

Biological Assessment

Central Everglades Planning Project

Everglades Agricultural Area Storage Reservoir and Treatment Wetlands Project
Submitted by the South Florida Water Management District Under Section 203
(Water Resources Development Act of 1986; 33 U.S.C. 2231(a)(1)), as amended)
to the Assistant Secretary of the Army of Civil Works.

Prepared by: U.S. Army Corps of Engineers, Jacksonville District, with information prepared by the South Florida Water Management District

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

1 INTRODUCTION

The purpose of a Biological Assessment (BA) is to evaluate the potential effects of a Federal action on listed species, including designated and proposed critical habitat, and determine whether the continued existence of any such species or habitat are likely to be adversely affected by the Federal action. The BA is also used in determining whether formal consultation or a conference is necessary (50 CFR Section 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 of 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 project (50CFR Section 402.12(f)).

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 the BA is initiating consultation with the U.S. Fish and Wildlife Service (USFWS) regarding the South Florida Water Management District (SFWMD) Section 203 Everglades Agricultural Area (EAA) Southern Reservoir and Storm Water Treatment Area (STA) Project. SFWMD prepared a feasibility study and environmental documentation pursuant to Section 203 of the Water Resources Development Act (WRDA) of 1986 (33 U.S.C. 2231(a)(1)), as amended, and submitted this study on March 30, 2018 to the Assistant Secretary of the Army for Civil Works (ASA(CW)) for review in order to determine under 33 U.S.C. 2231(b) whether the study complies with Federal laws and regulations applicable to feasibility studies of water resources development projects. This SFWMD request, if approved, would be a Post Authorization Change Report (PACR) to modify the Central Everglades Planning Project (CEPP), which was authorized as a Federal project by Congress in 2016. The SFWMD request modifies CEPP features specific to the New Water Project Partnership Agreement (PPA). The SFWMD study was made available to the public on their website at https://www.sfwmd.gov/our-work/cerp-project-planning/eaa-reservoir.

The Corps has prepared a BA that identifies potential effects on listed species, including designated and proposed critical habitat, pertaining only to the features in the SFWMD Section 203 EAA Southern Reservoir and STA Project that differ from CEPP; namely conversion of the CEPP A-2 Flow Equalization Basin (FEB) to a deep storage reservoir, and conversion of 3,000 acres of upland agricultural land to a STA (further described in the following sections). This BA will also determine whether the continued existence of any listed species or habitat is likely to be adversely affected by the action. Species effects determinations for all remaining project components within the proposed SFWMD Section 203 EAA Southern Reservoir and STA Project are the same as outlined within the 2014 CEPP BA (USACE 2013) and 2014 CEPP Final Project Implementation Report and Environmental Impact Statement (PIR/EIS; USACE 2014).

2 CONSULTATION SUMMARY FOR CENTRAL EVERGLADES PLANNING PROJECT AND SOUTH FLORIDA WATER MANAGEMENT DISTRICT SECTION 203 EVERGLADES AGRICULTURAL AREA SOUTHERN RESERVOIR AND STORMAWATER TREATMENT AREA PROJECT

2.1 CONSULTATION SUMMARY CEPP 2014

Coordination with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NFMS) under the ESA of 1973, as amended, on CEPP occurred during development of the 2014 CEPP Final P (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 Everglade snail kite (*Rostrhamus sociablis plumbeus*), and its designated critical habitat, Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*; CSSS) and its designated critical habitat, wood stork (*Mycteria americana*) and Eastern indigo snake (*Drymarchon corais couperi*). A Programmatic Biological Opinion (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 the three endangered avian species (Everglade snail kite, CSSS and wood stork), it did describe the anticipated effects based on information available at the time of consultation. Due to the scale of CEPP, the project was divided into three construction phases that would each have its own Project Partnership Agreement (PPA) with the project's non-federal sponsor, SFWMD. The project features within each of the three PPAs (PPA New Water, PPA North and PPA South) are illustrated in **Table 2-1**. As outlined within the CEPP Programmatic BO, the USFWS will provide separate consultation documents for each PPA which may authorize incidental take, provide applicable reasonable and prudent measures and associated terms and conditions. The Corps would then undertake the agreed-to avoidance and minimization measures and implement any required terms and conditions. The preliminary conclusion from the 2014 CEPP 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 not likely to adversely affect, Florida panther (*Puma concolor coryi*), West Indian manatee (*Trichechus manatus*), and its designated critical habitat, American alligator (*Alligator mississippiensis*), American crocodile (*Crocodylus acutus*) and its critical habitat, deltoid spurge (*Chamaesyce deltoidea* ssp. *deltoidea*), Garber's spurge (*Chamaesyce garberii*), 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 paucifl*ora), Florida prairie clover (*Dalea carthagenesis floridana*), Florida semaphore cactus (*Consolea corallicola*), pineland sandmat (Chaemaesyce deltoidea pinetorium), sand flax (*Linum arenicola*), 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 completed for each PPA 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 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 Eastern indigo snake. Up to 268 Eastern indigo snakes could be harassed through being displaced as a result of the CEPP and up to two Eastern indigo snakes may be injured or killed (harmed).

A Programmatic Section 7 ESA 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 CEPP. The 2013 Programmatic BO concurred with the determination that CERP, including CEPP, is not likely to adversely affect any listed species or their designated critical habitat under NMFS' purview. The 2013 Programmatic BO also 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. No further consultation is necessary under ESA for species under NMFS' purview.

Table 2-1. CEPP Project features by PPA identified within the CEPP Final PIR/EIS (USACE 2014).

PPA North	• L-6 Diversion
	• S-8 Pump Modifications
	• L-4 Levee Degrade and Pump Station
	• L-5 Canal Improvements
	• Miami Canal Backfill
PPA 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*
PPA New Water	• Seepage Barrier L-31 N
	• A-2 FEB

2.2 DESCRIPTION OF PROJECT DIFFERENCES BETWEEN CEPP AND SFWMD SECTION 203 EAA SOUTHERN RESERVOIR AND STA PROJECT

The purpose of this BA is to evaluate the potential effects due to the proposed SFWMD Section 203 EAA Southern Reservoir and STA Project 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 action.

Potential effects that are evaluated within this BA are solely the direct and indirect effects associated with the proposed SFWMD Section 203 modification of the CEPP PPA New Water features which includes the change from a 14,000 acre shallow A-2 FEB to construction of a 6,500 acre A-2 Expansion Area (STA) and a 10,500 acre deep A-2 Reservoir (**Figure 2-1 and Table 2-2**). The SFWMD EAA Southern Reservoir and STA Project increase the acreage for water storage and treatment by 3,000 acres and 160,000 acre-feet (ac-ft) a year (**Table 2-2**).

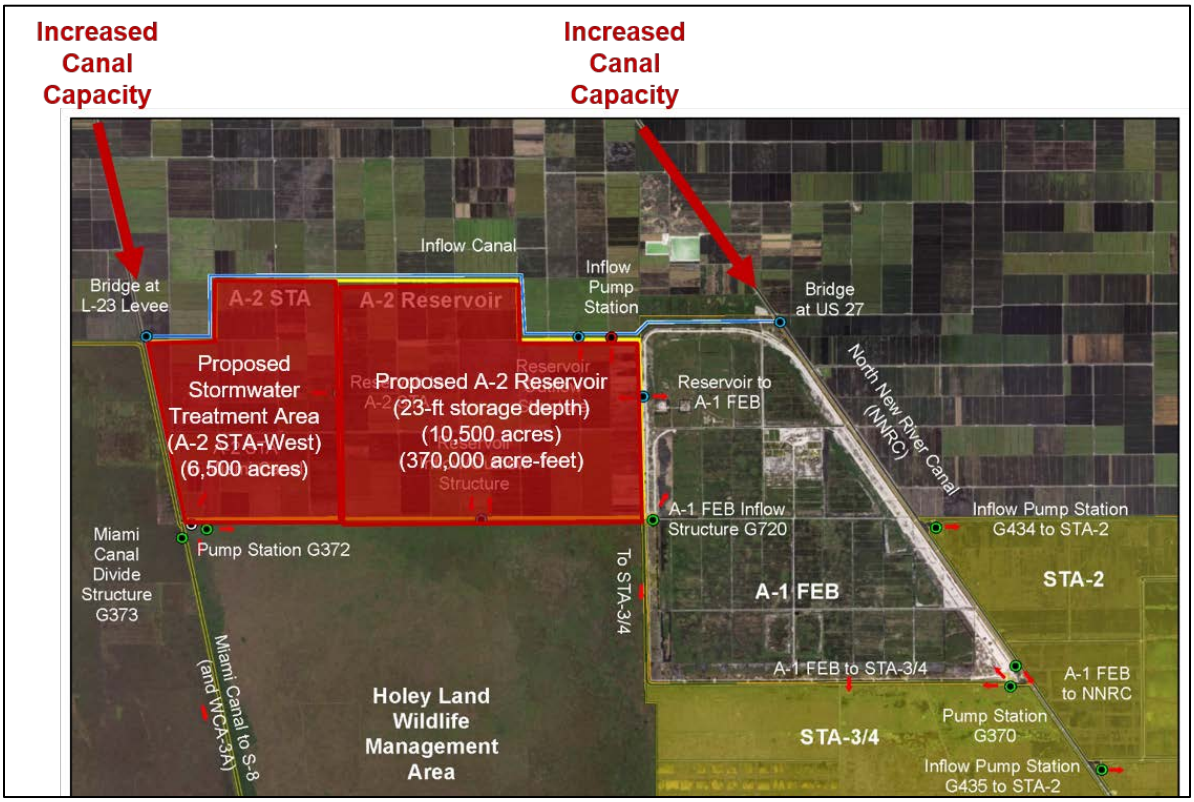


Figure 2-1. SFWMD Section 203 EAA Southern Reservoir Changes from the CEPP 2014 TSP.

Table 2-2. Changes in Acreage between CEPP and the SFWMD Section 203 EAA Southern Reservoir and STA Project. Refer to Figure 2-1 for Location of Features.

Feature	Acreage	Change in Acreage from CEPP A-2 FEB Footprint
CEPP A-2 FEB	14,000 acres	Removal of Project Feature
SFWMD A-2 Reservoir (East)	10,500 acres	10,500 acres conversion of wetland to reservoir

SFWMD A-2 STA (West)	6,500 acres	3,500 acres of previous FEB will now be STA, then an additional 3,000 acres of footprint on A-2 parcel will be STA
AC-FT of flow for CEPP	210,000 ac-ft/year	---
AC-FT of flow for SFWMD TSP	370,000 ac-ft/year	160,000 ac-ft/yr

The proposed SFWMD Section 203 EAA Southern Reservoir and STA Project is described in further detail in Section 3; the SFWMD reaffirms that the CEPP PPA North and PPA South project features can accommodate the additional flows south to the central Everglades, that would result from additional canal conveyance, storage, and treatment wetlands proposed on lands within the EAA (please refer to Appendix A, Section 6.0 for additional details). The Corps does not believe that the additional flows made available from the TSP to areas south of the project features (A-2 STA and A-2 Reservoir) would result in any additional or different species effect determinations from the CEPP BA (2013). The additional flows expected from the TSP are described in **Table 2-3,** which is extracted from the SFWMD Draft Report, Section 5 Table 5.2-1 (Appendix A).

Table 2-3. Effects of the TSP on Hydrology in Each South Florida Region

Geographic Region	FWO (CEPP)	TSP
Lake Okeechobee	Moderate hydrologic change, with improvements from reducing the frequency of low lake stages and adverse effect from increasing the frequency of high lake stages. Significant stage increase of 0.25-0.50 ft for the upper 70% of the stage duration curve, excluding extreme wet hydrologic conditions. Number of days with stages above 16 ft NGVD is increased from 768 to 1,163 during the 1965- 2005 period of simulation.	Minimal hydrologic change, with improvements from reducing the frequency of lake stages near the top of the beneficial range and from further reducing frequency of extreme low stages. A minor adverse effect from slightly increasing the frequency of extreme high lake stages. A minor beneficial effect from having more lake stages within preferred stage envelope more frequently than the FWO. A minor adverse effect from decreasing the frequency of low lake stages

Geographic Region	FWO (CEPP)	TSP
Northern Estuaries	Caloosahatchee Estuary: Moderate improvement. Mean monthly flows above 2,800 cfs and 4,500 cfs are reduced by 11 months and 4 months, respectively (14% and 12% reductions, respectively. Mean monthly flows less than 450 cfs are reduced by 4 months (15%). St. Lucie Estuary: Moderate to significant improvement. Mean monthly flows above 2,000 cfs and 3,000 cfs are reduced by 29 months and 7 months, respectively (34% and 23% reductions, respectively). Mean monthly flows less than 350 cfs are reduced by 27 months (29%). Additional analysis for Savings Clause requirements is provided in Annex B.	Caloosahatchee Estuary: Moderate improvement. Mean monthly flows above 2,800 cfs and 4,500 cfs are reduced by 10 and 3 months, respectively as compared to the FWO). Mean monthly flows less than 450 cfs increase by 3 months (12%). St. Lucie Estuary: Moderate hydrologic change, with improvements for high volume discharges and adverse effect for low volume discharges. The 14-day moving average above 2,000 cfs is reduced by 14 as compared to the FWO. Mean monthly flows less than 350 cfs are increased by 1 month. Provides an overall 55% reduction in discharge volumes and a 63% reduction in the number of discharge events to the Northern Estuaries from Lake Okeechobee, in conjunction with other authorized projects. High flow discharges lasting more than 60 days in the Caloosahatchee River Estuary (CRE) or more than 42 days in the St. Lucie Estuary (SLE) have been found to be particularly damaging to the oyster populations. The additional storage and treatment proposed in the PACR would reduce the number of these discharges by an additional 40% in the CRE and 55% in the SLE, in addition to the benefits provided by CEPP.
Greater Everglades: WCA 2A and WCA 2B	WCA 2A (2A-17): Moderate improvement. Stages are decreased by 0.1-0.3 ft under all hydrologic conditions. WCA 2B (2B-Y): Minor adverse effect. Stages within WCA 2B are slightly decreased by less than 0.10 ft for wet-to-normal conditions and stages are decreased by 0.25 ft during the driest 20% of the stage duration curve. Compared to the ECB, stages within WCA 2B are moderately improved with significant	WCA 2A (2A-17): Moderate improvement. Stages are slightly increased under all hydrologic conditions especially in NW 2A which tends to stay too dry. Annual overland flow increases by 60,000 ac-ft on an average annual basis. WCA 2B (2B-Y): Negligible adverse impacts as stages within WCA 2B are slightly increased by less than 0.10 ft between 20%-80% of the stage duration curve.

Geographic Region	FWO (CEPP)	TSP
Greater Everglades: WCA 3A and WCA 3B	a) **L-28 Triangle**: Minor improvement. Stages increased by 0.1-0.2 ft during all hydrologic conditions, excluding extreme wet conditions. b) **Northwest WCA 3A (3A-NW)**: Major improvement. Stages are generally significantly increased by 0.6-0.8 ft. c) **Northeast WCA 3A (3A-NE)**: Major improvement. Stages are increased by 0.4-0.7 ft, with no significant change during extreme wet conditions and a slight increase in stage for extreme dry conditions. d) **East-Central WCA 3A (3A-3)**: Major improvement. Stages are generally increased by 0.2-0.5 ft, with no significant change during the wettest 20% of conditions. e) **Central WCA 3A (3A-4)**: Minor to Moderate favorable effect. Stages are generally increased by 0.1-0.2 ft during average to dry conditions, with a slight depth reduction during the wettest 10% of conditions and no significant change during extreme dry conditions. f) **Southern WCA 3A (3A-28)**: Minor improvement. Stages are decreased by 0.1-0.2 ft during the wettest 5% of conditions and slightly decreased during normal to dry conditions. g) **WCA 3B (Site 71)**: Moderate to major improvement. Stages are increased under all hydrologic conditions, including stage increases of 0.1 ft during the upper 20% of the stage duration curve (normal to extreme wet conditions), stage increases of 0.2-0.3 ft for normal to dry conditions, and a slight stage increase during extreme dry conditions.	a) **L-28 Triangle**: Moderate beneficial effect as stages are increased by 0.1-0.2 ft under normal-to-dry hydrologic conditions, with no significant change indicated for extreme wet conditions. b) **Northwest WCA 3A (3A-NW)**: Moderate beneficial effect as stages are increased by 0.1-0.2 ft, except in the wettest 20% of conditions. Annual overland flow increases by 47,000 ac-ft on an average annual basis. c) **Northeast WCA 3A (3A-NE)**: Minor beneficial effect. Stages increased by 0.1 ft with a minor decrease during 30% dry conditions. Annual overland flow increases by 47,000 ac-ft on an average annual basis. d) **East-Central WCA 3A (3A-3)**: Minor beneficial effect. Stages slightly increased by less than a 0.1 ft, with no significant change during the wettest 5% of conditions. e) **Central WCA 3A (3A-4)**: Negligible effect. Stages experience a minor increase of less than a 0.1 ft during average conditions with no significant change during extreme dry and wet conditions. f) **Southern WCA 3A (3A-28)**: Minor beneficial effect. Stages are decreased by 0.1-0.2 ft during the wettest 5% of conditions and slightly decreased during normal-to-dry conditions. g) **WCA 3B (Site 71)**: Negligible effect. Peak stages exceed 9.0 ft NGVD less than 1% of period of simulation.

Geographic Region	FWO (CEPP)	TSP
Greater Everglades: ENP	a) **Northwest ENP (NP-201)**: Minor to moderate adverse effect. Stages are significantly decreased by 0.1-0.3 ft under both wet and dry hydrologic conditions; stages are slightly increased or unchanged for normal hydrologic conditions between approximately 35% and 55% on the stage duration curve. b) **Northeast ENP (NESRS-2)**: Major improvement. Stages are significantly increased by 0.5-0.9 ft under all hydrologic conditions. c) **Central ENP (P-33)**: Major improvement. Stages are increased by 0.2-0.4 ft under all hydrologic conditions. d) **Taylor Slough**: Minor adverse effect. Stages are slightly decreased by approximately 0.1 ft during the wettest 20% of hydrologic conditions and slightly increased by 0.1-0.2 ft	a) **Northwest ENP (NP-201)**: Stages are increased by 0.1 ft during 30% wettest hydrologic conditions b) **Northeast ENP (NESRS-2)**: Minor improvement. Stages are not significantly (less than 0.1 ft) increased under all hydrologic conditions. c) **Central ENP (NP-33**): Minor improvement. Stages are slightly increased under 40% wettest hydrologic condition. d) **Taylor Slough**: Stages are slightly increased by less than a 0.1 ft during the driest 50% of hydrologic conditions.
Southern Estuaries	a) **Biscayne Bay**: Minor-to-moderate adverse effect. Combined total average annual canal discharges to central and southern Biscayne Bay are increased by 17,000 ac-ft (15%). Average annual canal discharges to northern Biscayne Bay are reduced by 46,000 ac-ft (11%). b) **Florida Bay**: Moderate improvement. Combined average annual overland flows from southern ENP to Florida Bay (Transect	a) **Biscayne Bay**: Minor beneficial effects to nearshore Biscayne Bay. Combined total average annual canal discharges to central and southern Biscayne Bay are increased by 6,200 ac-ft (2%). Average annual canal discharges to northern Biscayne Bay are increased by 12,000 ac-ft (2%). b) **Florida Bay**: Minor beneficial effects. Combined average annual overland flows from southern ENP to nearshore Florida Bay (Transect 23) are increased by 7,000 ac-ft.

Since features authorized within the 2014 CEPP PPA North and CEPP PPA South remain unchanged, the Corps reaffirms the 2013 CEPP BA species effect determinations for listed species that may potentially occur within areas included within the CEPP South PPA and CEPP North PPA (refer to **Table 2-1**. The action area for this BA includes solely the A-2 deep reservoir and the A-2 STA. Species that may be affected by either the A-2 Reservoir or the A-2 STA are noted in **Table 4-1**.

On April 19, 2018, the Corps provided a list of federally listed threatened and endangered species that may be present in the action area via email to USFWS for concurrence. The Corps revised the species list to only include species within the SFWMD Section 203 EAA Southern Reservoir and STA Project Footprint (**Figure 2-1**) for submittal of this BA. The USFWS responded by email April 30, 2018 and asked the Corps to make a determination on the Roseate tern. However, the Roseate tern is

not located within the SFWMD Section 203 EAA Southern Reservoir and STA Project Action Area/Palm Beach County, therefore, the Corps does not expect any effects to Roseate tern.

3 PROJECT DESCRIPTION

The proposed SFWMD Section 203 EAA Southern Reservoir and STA Project is located in southern Florida, south of Lake Okeechobee in south Palm Beach County (**Figure 3-1**).

The SFWMD study states that "All Project Partnership Agreement (PPA) North and PPA South components of the authorized CEPP plan in areas south of the EAA are robust enough to accommodate the TSP [Tentatively Selected Plan] and would remain unchanged under this CEPP PACR. The TSP affects only the water storage, treatment, and conveyance features in the New Water PPA of CEPP in the EAA (Appendix A, Section 6.0, page 6-2)".

As described by SFWMD (Appendix A, Section 6.0), the TSP includes a conceptual design for a 10,500 acre (which holds 240,000 acre-feet (ac-ft)) above-ground reservoir and a 6,500-acre STA, located on the A-2 parcel and A-2 Expansion area (STA), that will work in conjunction with the existing 60,000 ac-ft A-1 FEB, STA-2, and STA-3/4 to meet state water quality standards (**Figure 3-2**). The proposed A-2 Reservoir is 10,500 acres and is designed to have a normal full storage water depth of approximately 22.6 feet. The TSP also includes 1,000 cubic feet per second (cfs) of additional conveyance capacity in the Miami Canal within the EAA and 200 cfs of additional conveyance capacity in the North New River Canal within the EAA. The A-2 Reservoir outflows can be sent to the new A-2 STA (located adjacent to and directly west of the A-2 Reservoir), to the existing A-1 FEB, to the existing STA-2, and/or to the existing STA-3/4. Outflows from the A-2 STA would be conveyed to the Miami Canal south of the existing G-373 divide structure. A-2 Reservoir outflows could also be conveyed to either the Miami Canal or North New River Canal via the intake canal.

According to SFWMD, this combination of new and existing storage and treatment features provides maximum operational flexibility and efficiency. The TSP includes refined operations to provide water to meet other water related needs (*i.e.*, water supply) in the EAA. These refined operations are described in detail in Annex C, located on the SFWMD website: https://www.sfwmd.gov/our-work/cerp-project-planning/eaa-reservoir.

The focus of the SFWMD TSP is to provide sufficient water storage, conveyance and treatment capacity in the EAA to deliver freshwater flows to the central Everglades by redirecting undesirable discharges to the Northern Estuaries to the central portion of the Everglades to further restore ecosystem conditions.

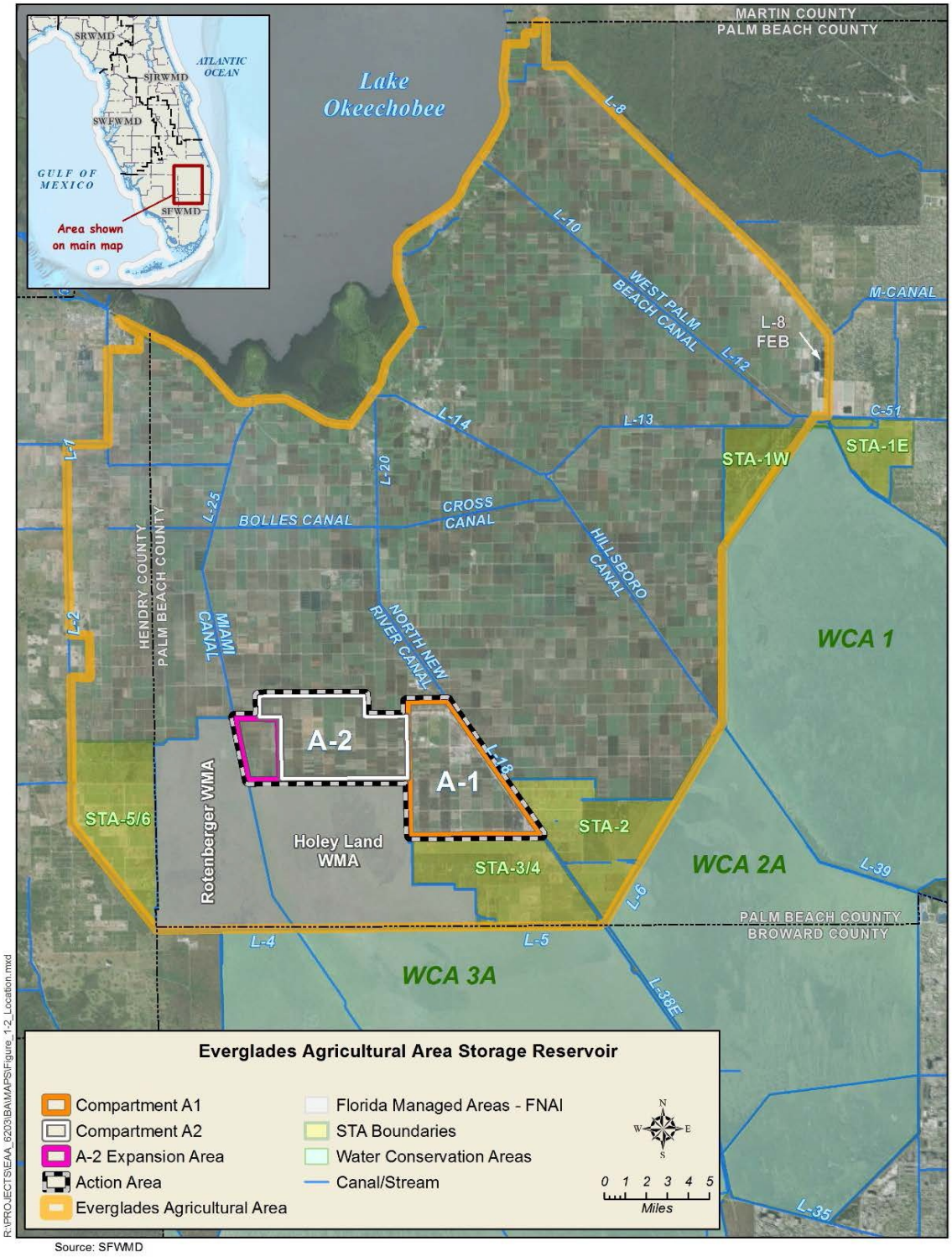


Figure 3-1. Regional Map for the SFWMD Section 203 EAA Southern Reservoir and STA Project.

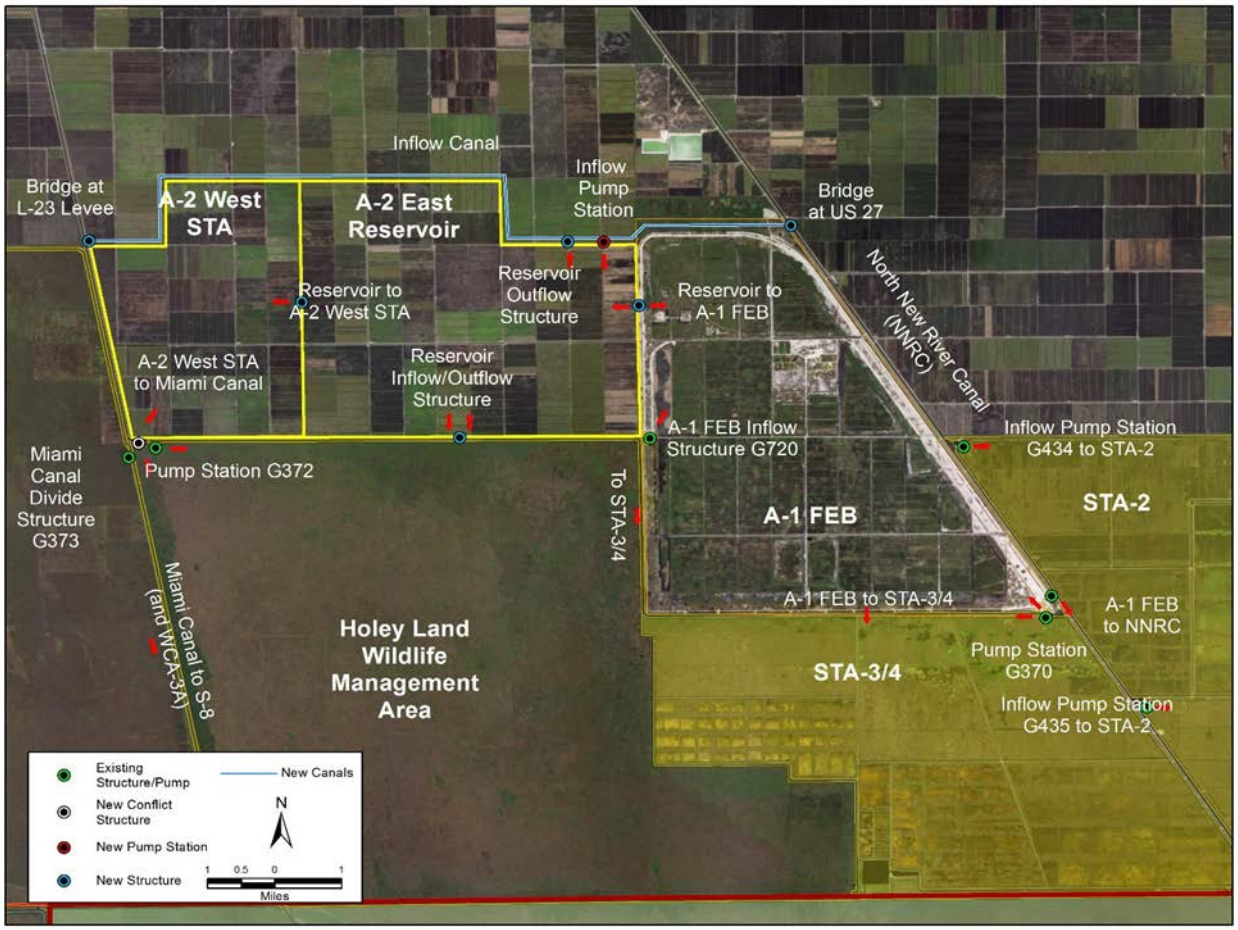


Figure 3-2. **SFWMD Section 203 EAA Southern Reservoir and STA Project Features. Change includes the A-2 East Reservoir and the A-2 West STA (Changes highlighted in Figure 2-1**).

3.1 PROJECT GOALS AND OBJECTIVES

The purpose of the proposed project is to increase above-ground water storage amounts by building a reservoir on the A-2 parcels and the A-2 Expansion area, and to revise the project component of the A-2 parcel from a shallow FEB to a deep reservoir to increase water storage from 210,000 ac-ft/year to a 370,000 ac-ft/year (Appendix A, SFWMD 2018). The overall objectives for CERP, CEPP, and the proposed project are the same, as presented in **Table 3-1.**

Table 3-1. Goals and Objectives of the Proposed Project

CERP Objective	CEPP Objective	SFWMD Proposed Project
CERP Goal: Enhance Ecological Values		
Improve habitat and functional quality	Reduce high-volume discharges from Lake Okeechobee to improve the quality of oyster and submerged aquatic vegetation (SAV) habitat in the Northern Estuaries	Reduce high volume discharge by 40% in the Caloosahatchee, and 55% in the St. Lucie Estuary from Lake Okeechobee to improve the quality of oyster and SAV habitat in the Northern Estuaries
	Restore seasonal hydroperiods and freshwater distribution to support a natural mosaic of wetland and upland habitat in the Everglades System	Further improve upon restoration of 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	Further 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
Increase the total spatial extent of natural areas	No corresponding CEPP objective; consider this objective in future increments.	No corresponding SFWMD Proposed Project objective
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	No corresponding SFWMD Proposed Project objective
	Restore more natural water level responses to rainfall to promote plant and animal diversity and habitat function	Further 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	Increase availability of water supply
Reduce flood damages (agricultural/urban)	No corresponding CEPP objective; consider this objective in future increments	No corresponding SFWMD Proposed Project objective
Provide recreational and navigation opportunities	Provide recreational opportunities	Provide recreational opportunities
Protect cultural and archeological resources and values	Protect cultural and archeological resources and values	Protect cultural and archeological resources and values

4 DESCRIPTION OF THE SFWMD SECTION 203 EAA SOUTHERN RESERVOIR AND STA PROJECT EXISTING CONDITIONS

Existing conditions within the A-2 Reservoir and A-2 STA action area are described below. Existing conditions south of the action area (Water Conservation Areas, existing STAs, Etc.) are thoroughly described in the CEPP BA (USACE 2013) and CEPP BO (USFWS 2014; http://141.232.10.32/pm/projects/proj_51_cepp.aspx) and are incorporated by reference into this document.

The A-2 STA and A-2 Reservoir project area is characterized by three soil types: Lauderhill muck (drained), Pahokee muck (drained), and Terra Ceia muck (drained). These soil types are classified as very poorly drained, hydric, organic (herbaceous organic parent material) soils over shallow limestone (26–80 inches). The land use for the SFWMD Section 203 EAA Southern Reservoir and STA Project includes the CEPP 14,000 acre FEB, and an additional 3,000 acres in the A-2 Expansion Area that is currently under lease for sugarcane. Within this project area, there are also channelized waterways and linear water control features used to manipulate water levels in support of agricultural operations.

The CEPP FEB within the A-2 STA and A-2 Reservoir would support wetland functions and provide foraging and nesting opportunities for wading birds. Further benefits are described in detail in the CEPP BA (2013). Current wetlands within the additional 3,000 acres of the A-2 Expansion area are degraded wetlands due to sugar cane farming practices that comprise the majority of the surrounding area. Wetland features are generally dominated by nuisance and/or exotic vegetation as identified by the Florida Exotic Pest Plant Council on the List of Invasive Species, and appear to be isolated by the surrounding sugar cane farming. Although wetland features appear to be ecologically isolated from natural uplands and other wetland features, some wetland features appear to have a hydrologic connection to the network of drainage ditches and canals. The remnant wetland habitat is degraded and predominately exotic (vegetation and exotic/invasives are described in detail in the Future Without Project Sections C.1.3.1 and C.1.3.3 of the SFWMD Section 203 draft report), but still provide limited habitat for native and faunal species including amphibians and reptiles, birds, and small mammals.

4.1 FEDERALLY LISTED SPECIES

The Corps has coordinated the existence of federally listed species within the SFWMD proposed project action area with the USFWS via email correspondence on April 18, 2018. The species list in this BA only contains species within Palm Beach County and the SFWMD Section 203 EAA Southern Reservoir and STA Project Area, rather than the list that was sent in previous email correspondence to the USFWS. The action area (A-2 STA and A-2 Reservoir) currently contains habitat that has the potential to support protected and federally threatened or endangered species, in particular, Eastern indigo snake, northern crested caracara, Everglade snail kite, wood stork, and Florida panther. The action area does not contain designated critical habitat for any species and is outside of the consultation area for Florida bonneted bat.

Table 4-1. List of threatened and endangered species known to occur in the SFWMD TSP Action Area within Palm Beach County and Corps' Species Effect Determination for A-2 STA and A-2 Reservoir Project.

Common Name	Scientific Name	Federal Status[1]	Corps Effect Determination
FLOWERING PLANTS			
Beach jacquemontia	*Jacquemontia reclinata*	E	No Effect
Four-petal pawpaw	*Asimina tetramera*	E	No Effect
Johnson's seagrass	*Halophila johnsonii*	T	No Effect
Okeechobee gourd	*Curcubita okeechobeensis* ssp.	E	No Effect
Tiny polygala	*Polygala smallii*	E	No Effect
LICHENS			
Florida perforate cladonia	*Cladonia perforata*	E	No Effect
INVERTEBRATES			
Bartram's hairstreak butterfly	*Strymon acis bartrami*	E	No Effect
Stock Island tree snail	*Orthalicu reses* (not including *nesodryas*)	T	No Effect
REPTILES			
American alligator	*Alligator mississippiensis*	SAE	No Effect
American crocodile	*Crocodylus acutus*	T	No Effect
Eastern indigo snake	*Drymarchon corais couperi*	T	May Affect
Gopher tortoise	*Gopherus Polyphemus*	C	No Effect
BIRDS			
Audubon's crested caracara	*Caracara cheriway*	T	May Affect
Everglade snail kite	*Rostrhamus sociabilis plumbeus*	E	May Affect
Florida scrub-jay	*Aphelocoma coerulescens*	T	No Effect
Piping plover	*Charadrius melodus*	T	No Effect
Red-cockaded woodpecker	*Picoides borealis*	E	No Effect
Wood stork	*Mycteria americana*	T	May Affect
MAMMALS			
Florida panther	*Felis concolor coryi*	E	May Affect
West Indian manatee	*Trichechus manatus*	T	No Effect

Source: SFWMD field observations and FNAI website, updated March 2018.

1 E – federally endangered; T – federally threatened; SAE – Similarity in appearance, endangered; EXPN – experimental population, nonessential

5 SPECIES DESCRIPTIONS AND EFFECTS DETERMINATIONS

The Corps recognizes that until completion of CERP there are few opportunities within the current constraints of the Central and South Florida system to completely avoid effects to listed species. However, the SFWMD proposed project would improve the quantity and timing of flows to the Northern Estuaries, Everglades and Florida Bay.

Potential effects on listed species were evaluated based on the SFWMD Future Without Project (FWO)/No Action Alternative, which includes all CEPP features as outlined with the CEPP Final PIR/EIS (2014) and compared with the SFWMD proposed project changes to the 2014 CEPP. As previously stated in Section 1 and Section 2.2 of this BA, species effect determinations will involve evaluating only effects resulting from the change from the CEPP Feature A-2 shallow FEB to the deep A-2 Reservoir and the change in land use associated with conversion of existing agriculture and wetlands within the A-2 Expansion area to the A-2 STA. All other effect determinations remain the same as detailed within the CEPP BA (USACE 2013) and CEPP BO (USFWS 2014) with regard to all other CEPP project features and species that may exist within STA 2, STA 3/4, the Water Conservation Areas, Florida Bay, and Biscayne Bay.

Species discussed in this section are either known to occur or could potentially occur within the action area and include the Eastern indigo snake, Audubon's crested caracara, Everglade snail kite, wood stork, and Florida panther. For information on species listed in **Table 4-1** that are not expected to occur within the project area, please refer to Appendix A (SFWMD Section 203 Report, Annex A – Biological Assessment).

5.1 AUDUBON'S CRESTED CARACARA (CARACARA)

The threatened caracara is a unique raptor scavenger in the family Falconidae that reaches the northern limit of its geographic range in the southern United States. In Florida, this raptor occurs as an isolated population in the south-central region of the state. Changes in land use patterns throughout central Florida have resulted in this population becoming a subject of concern. This raptor has been documented to occur almost exclusively in cabbage palms on privately owned cattle ranches in the south-central part of the state.

Currently, much of the caracara population is found on improved or semi-improved pastures on private cattle ranches. Available evidence suggests that the most serious threat to Florida's caracara population is loss or degradation of nesting and feeding habitat. Such loss is most commonly due to conversion of pasture and other grassland habitats and wetlands to citrus, sugar cane, other agriculture, and urban development.

Adult caracaras exhibit high site- and mate-fidelity; therefore, extensive loss of habitat within the home range, particularly of the nesting site itself, may cause the pair to abandon that home range, or at least the nesting site (Morrison 2001). Egg laying has been documented as early as September and as late as June; peak activity occurs from late December through February (Morrison 2001). Clutch size is 2-3 eggs, with an incubation period of 32-33 days. Double brooding can occur if a nest is lost early in the season. Fledging occurs at 8 weeks. Young are dependent on parents for at least 2 months post-fledging, and may remain in the natal territory for up to 10 months. Most young in Florida leave their natal territory after 4-6 months and form groups of up to 30 individuals.

The caracara is an opportunistic feeder, taking prey items such as insects, small reptiles, amphibians, and small mammals. Eggs and carrion are also included in the diet of caracaras. Foraging for food takes place in early morning and late afternoon. Caracaras often walk through pastures searching for prey items, particularly after disturbance such as mowing or plowing. Caracaras have also been observed feeding in recently burned areas. Hunting takes place from conspicuous perches or while in flight. Once prey is sighted, the caracara flies to the ground and walks up to prey item (Morrison 1996, Morrison 2001). Caracara have been documented to nest near the project area are shown in **Figure 5-1**.

Caracara have been observed within the A-1 FEB in December 2013 during construction monitoring (SFWMD, personal communication). Additionally, there are three documented observations of caracara near the 10-mile buffer of the project to the west, and several observations of this species within the 20-mile project buffer, also concentrated west of the project within Hendry County (see **Figure 5-1**). A review of eBird data identified an observation of caracara within the A-2 parcel of the project on January 1, 2003 (eBird 2017a). A caracara also was observed just outside the eastern boundary of the A-1 parcel on U.S. Route 27 on January 17, 2015 (eBird 2017b). No suitable nest trees for caracara are present within the SFWMD Project action area.

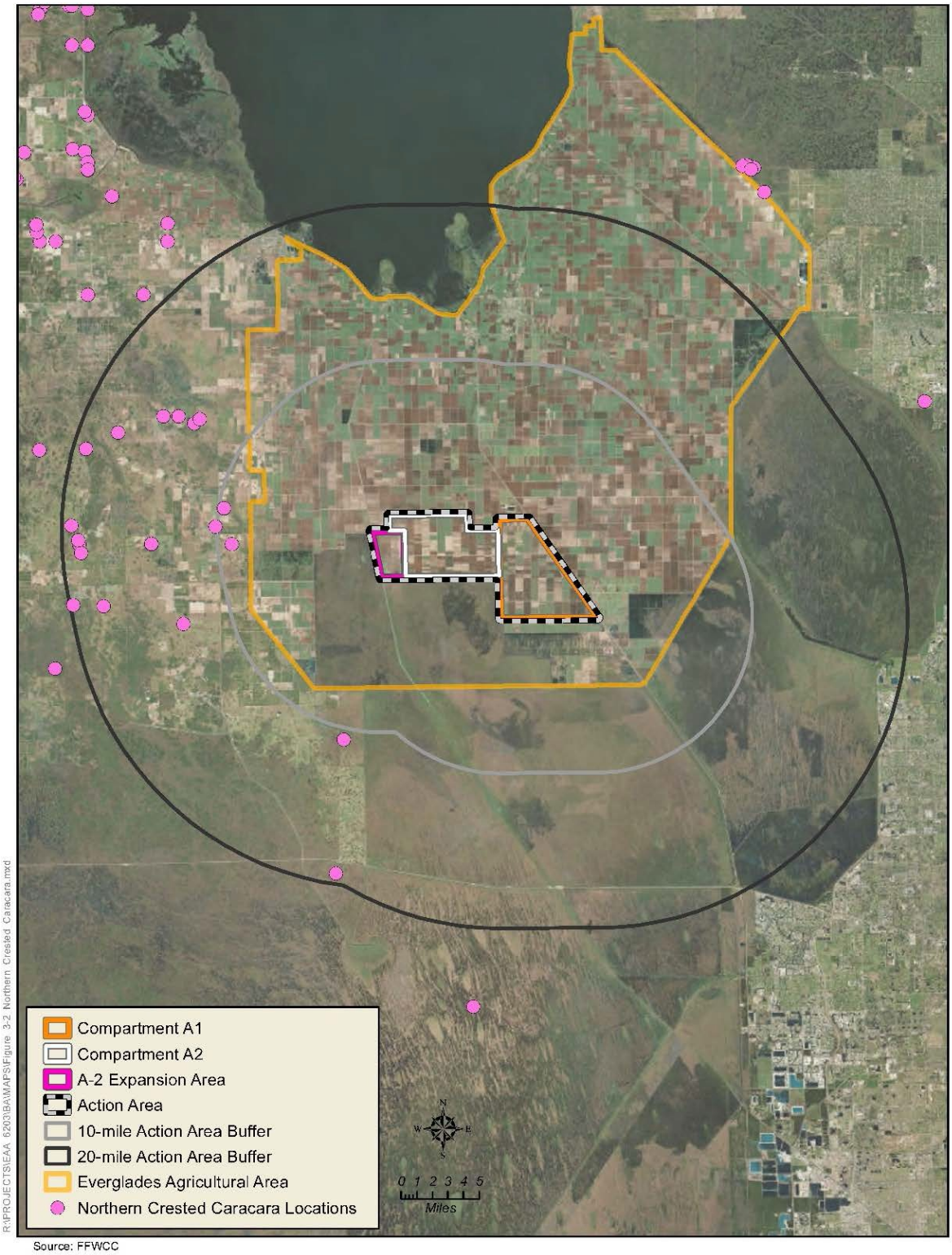


Figure 5-1. Caracara nesting locations data from 1987-2011. Source: SFWMD Section 203 Report, Annex A.

5.1.1 Audubon's Crested Caracara (Caracara) Effect Determination

The caracara prefers open fields, pine flatwoods, dry prairie, and wet prairie. The caracara nests primarily in cabbage palm trees and forages in vegetated areas less than 1-foot in height. The USFWS defines the primary protection zone for this species as 985 feet outward from a nesting tree (USFWS 2004). The secondary zone is 4,920 feet outward from an active nesting tree. Direct impacts to the northern crested caracara would include effects associated with the construction and operation of the proposed A-2 Reservoir and A-2 STA.

There are no freestanding cabbage palm trees within the A-2 STA and A-2 Reservoir, and no signs of previous or new caracara nesting activity. No known nest sites are located within 4,920 feet of the A-2 STA or A-2 Reservoir. Currently, many areas of the site contain vegetation higher than one foot or are inundated with water. Therefore, there is a low potential for the caracara to utilize the existing A-2 STA or A-2 Reservoir project areas for nesting or foraging habitat due to lack of preferred habitat. Construction of the A-2 STA and A-2 Reservoir on the proposed project site would also not provide suitable habitat for foraging or nesting caracara, as the interior of the A-2 STA site would contain emergent wetlands.

Potential indirect effects include an increase in traffic and noise levels during construction. An increase in traffic may increase the quantity of wildlife mortality along the project roadways. Caracaras are seen frequently along roadways feeding on the wildlife that has been killed by vehicle strikes. Although this would represent an increase in potential feeding opportunities, it also increases the caracaras' risk of being struck by vehicles. The increase in noise levels is not expected to cause an adverse effect to caracaras. Based upon the information outlined above, the A-2 STA and A-2 Reservoir Project may affect, but is not likely to adversely affect, caracara.

5.2 EASTERN INDIGO SNAKE

The threatened Eastern indigo snake is the largest native non-venomous snake in North America. 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 from xeric sandhills, to cabbage palm hammocks, to hydric hardwood hammocks (Schaefer and Junkin 1990). It has also been found in citrus groves and sugar cane. Eastern indigo snakes need relatively large areas of undeveloped land to maintain their population. In warm months, Eastern indigo snakes use a variety of natural areas and have large home ranges (Moler 1992; USFWS 1999). Eastern indigo snakes occupy larger home ranges in the summer than the winter. Information on this species in Florida indicates adult males have home ranges as high as 224 hectares in the summer (Moler 1992). Because it is such a wide-ranging species, the Eastern indigo snake is especially vulnerable to habitat fragmentation that makes travel between suitable habitats difficult. The main reason for its decline is 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).

In south Florida, the Eastern indigo snake is thought to be widely distributed. Given their preference for upland habitats, Eastern indigo snakes are not commonly found in great numbers in wetland complexes, though they have been found in pinelands, tropical hardwood hammocks, and mangrove forests in extreme south Florida (Duellman and Schwartz 1958; Steiner *et al*. 1983). Within the range of the gopher tortoise, tortoise burrows are favorite refugia for Eastern indigo snakes. They are known to use burrows made by cotton rats and land crabs, hollows at bases of trees and stumps, ground litter, trash piles and rock piles lining banks of canals and pipes or culverts.

Sexual maturity appears to occur around 3-4 years of age. In North Florida, breeding occurs November to April with females laying 4-12 eggs in May-June (Moler 1992). Most hatching of eggs occurs August-September, with yearling activity peaking in April-May (USFWS 1999). Limited data on reproduction in south Florida indicate the breeding season is extended; breeding occurs from June-January, egg deposition is April to July, and hatchlings are born through early fall (USFWS 1999). Although FFWCC has not reported any sightings of Eastern indigo snake in the A-2 STA and A-2 Reservoir project area, they have been observed within the A-1 FEB area (SFWMD, personal communication), and they also have been observed in other areas of the EAA (**Figure 5-2**) (note this figure does not contain the data for sightings within the A-1 portion of the project). Eastern indigo snakes were reported in the A-2 STA and A-2 Reservoir project area from 2006–2014. Currently, some of the former agricultural lands have converted back to wetland vegetation. Since the Eastern indigo snake is typically found in upland areas, it is anticipated that Eastern indigo snakes may be found in and around the levees and berms, as well as along roadways.

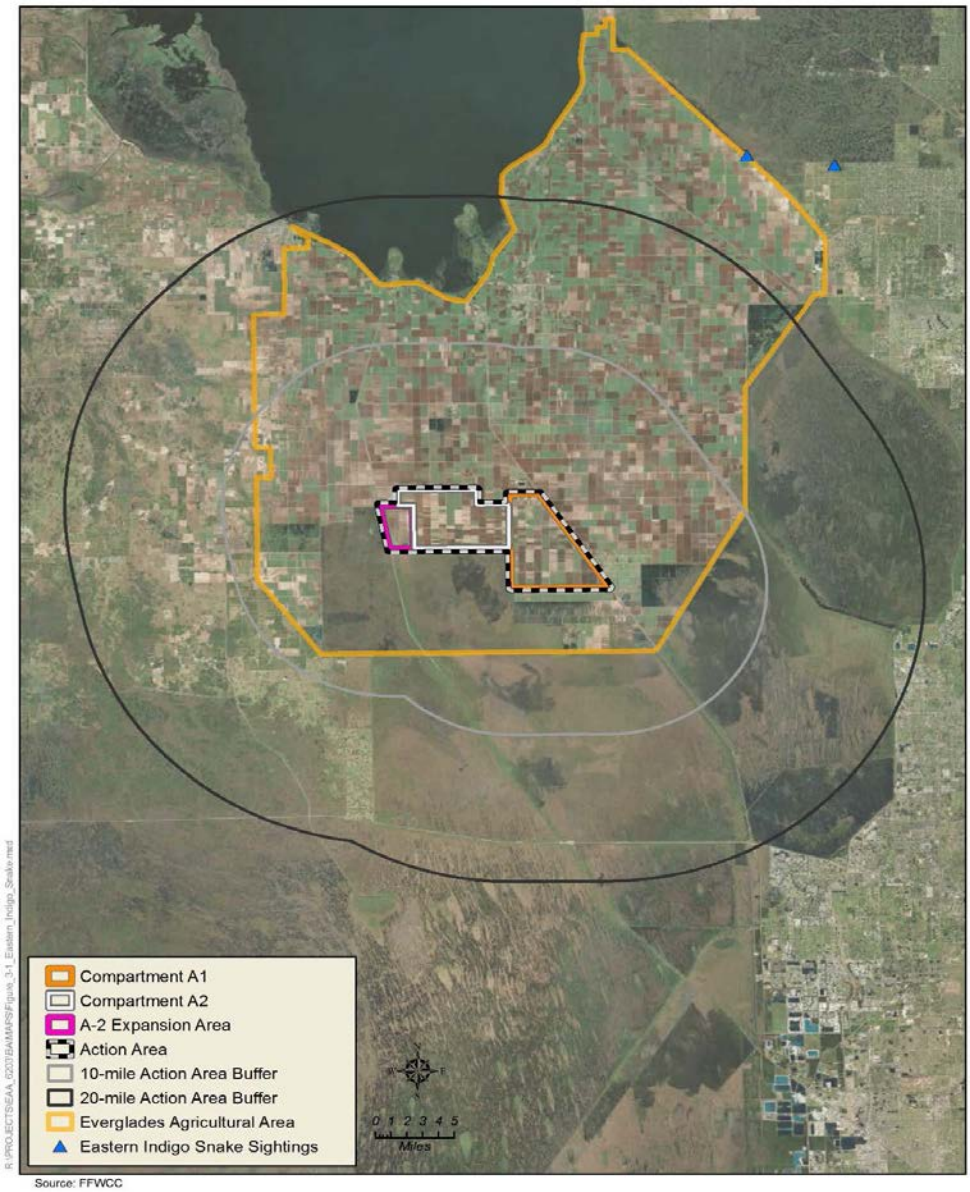


Figure 5-2. Eastern Indigo Snake Sightings from 1983-2012 (figure does not include A-1 FEB construction sightings).

5.2.1 Eastern Indigo Snake Effect Determination

Construction of the A-2 STA and A-2 Reservoir would result in the conversion of approximately 14,000 acres of FEB and 3,000 acres of sugar cane agricultural fields to stormwater treatment wetlands and above ground water storage reservoir. Eastern indigo snakes may forage along the edges of the A-2 STA and A-2 Reservoir during drier periods, but conditions within the impoundments would generally not be suitable for habitation as these areas are anticipated to be permanently inundated.

Eastern indigo snakes have a high probability of occurrence within the proposed A-2 STA and A-2 Reservoir footprints. The CEPP Final PIR/EIS (2014) and CEPP BA (2013) accounted for 14,000 acres of upland conversion to a FEB. This TSP results in an additional 3,000 acres of upland habitat removal and conversion of the land to a STA and deep water reservoir. As a result of the A-2 STA and A-2 Reservoir, Eastern indigo

snakes are likely to be displaced with the removal of 3,000 acres of potential habitat, thereby having a significant and unavoidable major adverse effect. Construction activities may result in Eastern indigo snakes leaving the area, abandoning den sites, and possibly losing foraging and mating opportunities. In addition, construction activities associated with the earth-moving equipment may increase the likelihood of adverse effects to eastern indigo snake. Heavy machinery, which would be re-contouring ground levels, removing and relocating berms, and constructing roads, may unearth eastern indigo snakes and cause inadvertent impacts to occur. Eastern Indigo Snake Standard Protection Measures shall be utilized during construction to avoid adverse effects to this species. Based upon the information outlined, construction of the A-2 STA and A-2 Reservoir may affect Eastern indigo snake.

5.3 EVERGLADE SNAIL KITE

The Everglade snail kite is listed as an endangered species by both the USFWS and the State of Florida. Although previously located in freshwater marshes over a considerable area of peninsular Florida, the range of the Everglade snail kite is now limited to central and southern portions of Florida. Six large freshwater systems are located within the current range of the Everglade snail kite: Upper St. Johns marshes, Kissimmee Chain of Lakes (KCOL), Lake Okeechobee, Loxahatchee Slough, the Everglades, and the Big Cypress basin. Habitats that have supported Everglade snail kites include East Orlando Wilderness Park, Blue Cypress Water Management Area, St. Johns Reservoir, and Cloud Lake, Strazzulla, and Indrio impoundments. In the KCOL, Everglade snail kites may occur within most of the lakes and adjacent wetlands, with the majority of snail kite nesting occurring within Lake Kissimmee, Lake Tohopekaliga, and East Lake Tohopekaliga. In the KCOL, Everglade snail kites have also nested in lower numbers on Lakes Hatchineha and Jackson. Everglade snail kite nesting also has occurred periodically since about 2002 in Lake Istokpoga.

Lake Okeechobee and surrounding wetlands represent significant nesting and foraging habitats that have historically supported Everglade snail kites. In the Loxahatchee Slough region of Palm Beach County, Everglade snail kites may occur in the Loxahatchee National Wildlife Refuge (WCA-1) and throughout the remaining marshes in the vicinity, most frequently nesting within Grassy Waters, also known as the West Palm Beach Water Catchment Area. This species also occurs within nearly all remaining wetlands of the Everglades region, including WCA-2B, WCA-3A, WCA-3B, and Everglades National Park (ENP).

Lake Okeechobee is of particular importance for this species as it serves as a critical stopover point as Everglade snail kites traverse the network of wetlands within their range. A loss of suitable habitat and refugia, especially during droughts in the lake, may have significant demographic consequences. Lake Okeechobee is critical to the long-term population persistence, especially given the susceptibility of juvenile Everglade snail kites in the Kissimmee River Valley to an increased frequency of local disturbance events due to cold weather and the treatment of hydrilla. The Everglade snail kite feed primarily on apple snails which are dependent on the hydrology and water quality of the watersheds. Foraging habitat requires shallow open-area ponds with low marsh areas; nesting/roosting sites are located over water. Foraging conditions have expanded recently due to the increase in exotic apple snail population (since about 2010). As a result, the Everglade snail kite breeding season has lengthened (sometimes into fall) and some previous unsuitable foraging areas now have the more robust exotic apple snail populations that are being exploited by foraging Everglade snail kites.

With the action area of this BA, designated critical habitat includes western portions of Lake Okeechobee. Based on the description in the Federal Register (1977), Everglade snail kite critical habitat in Lake Okeechobee is located in the western parts of Glades and Hendry Counties, extending along the western shore to the east of the dike system and the un-diked high ground at Fisheating Creek, and from the

Hurricane Gate at Clewiston northward to the mouth of the Kissimmee River, including all the spike rush 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. Critical habitat for the Everglade snail kite includes the southwest and western shore of Lake Okeechobee from Clewiston to the Kissimmee River, excluding deep open water **(Figure 5-3**). Nests around the action area are shown in **Figure 5-4**.

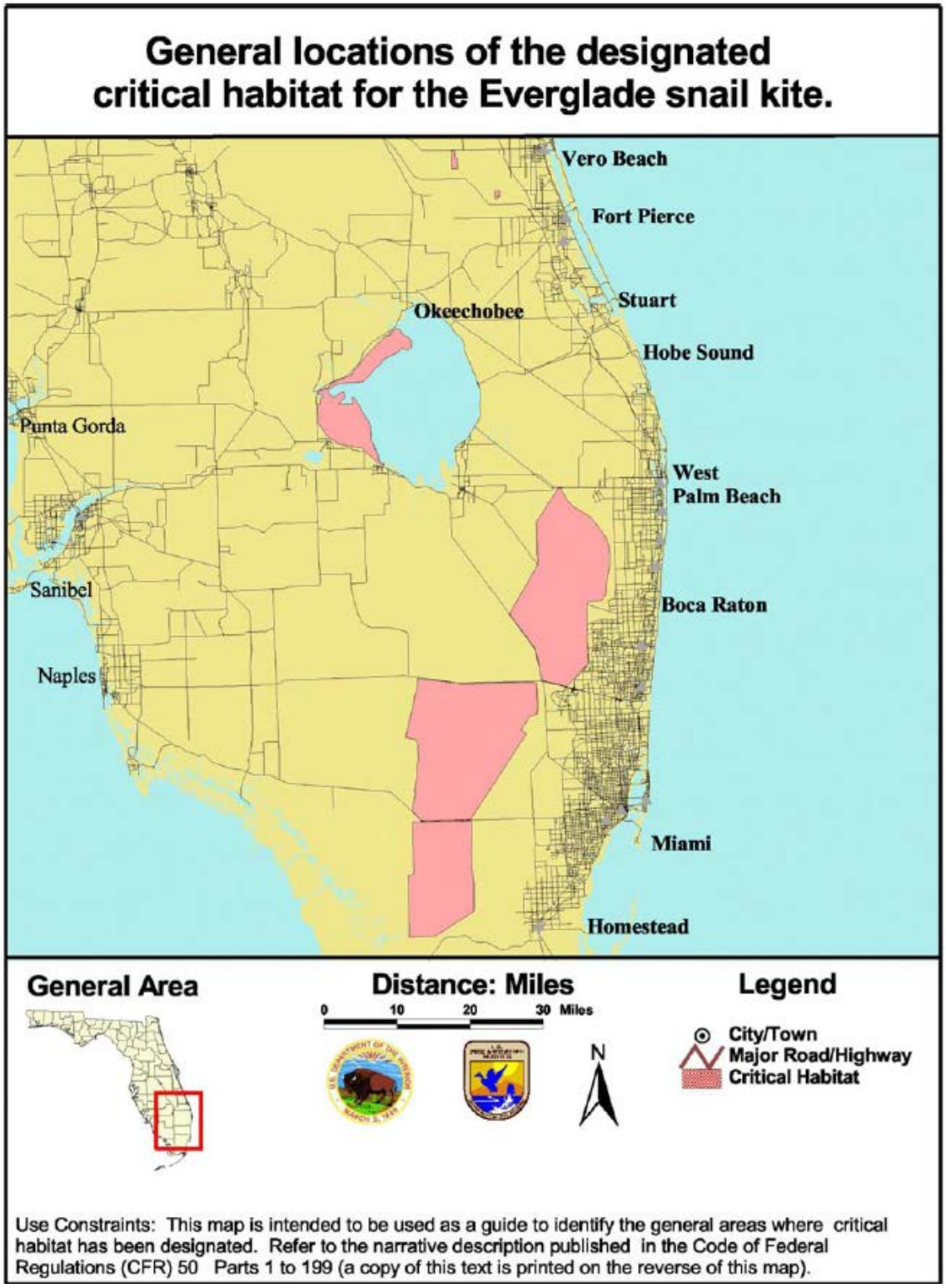
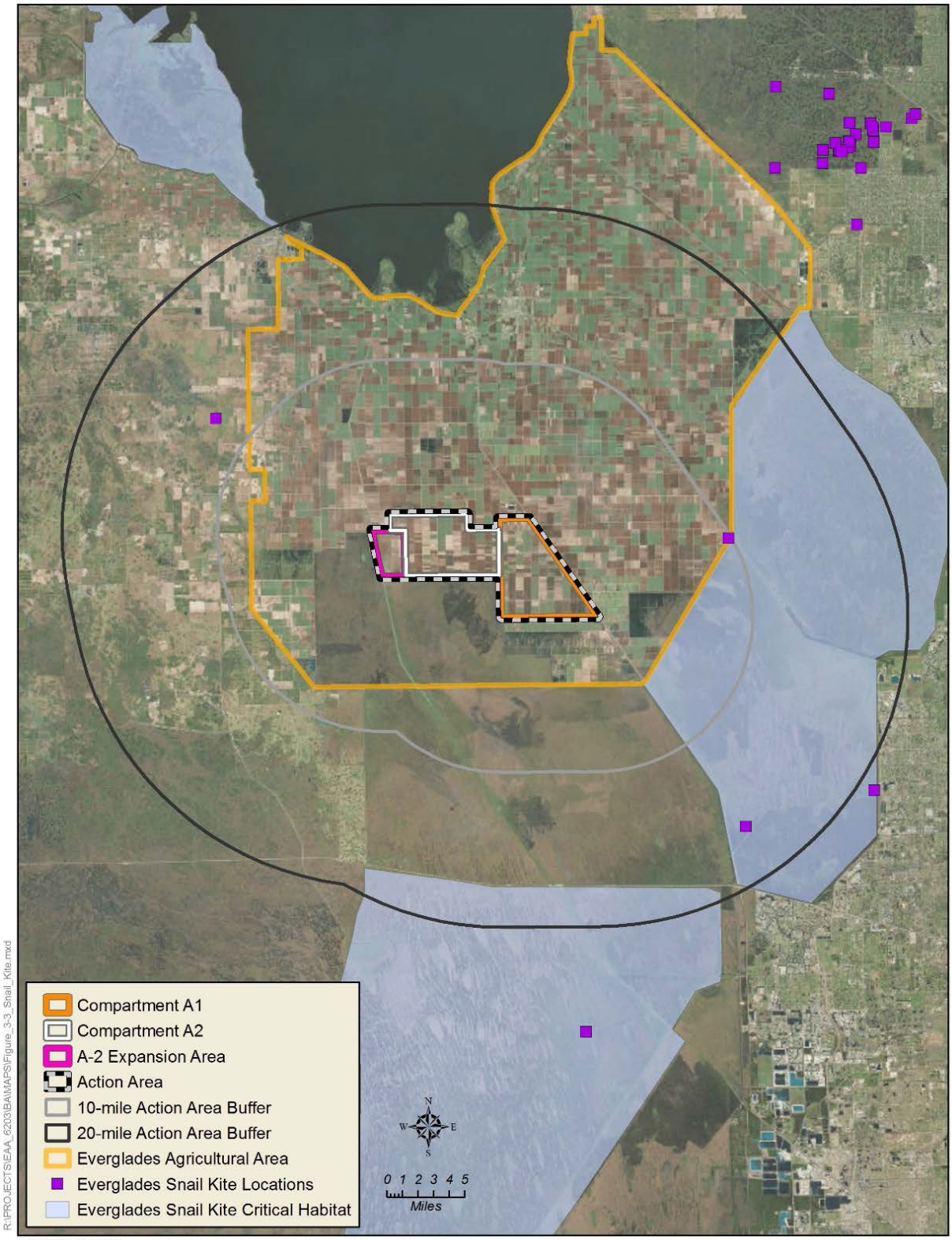


Figure 5-3. Everglade Snail Kite Critical Habitat Map.



Source: FFWCC

Figure 5-4. Everglade Snail Kite Occurrences from 1987-2011. Source: SFWMD Section 203 Report Annex A, Draft Biological Assessment.

5.3.1 Everglade Snail Kite Effect Determination

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). Everglade snail kites require foraging areas that are relatively clear and open to visually search for apple snails. Suitable foraging habitat is typically a combination of low profile marsh and a mix of shallow open water. Shallow wetlands with emergent vegetation such as spike rush, maidencane, sawgrass, and other native emergent wetland plant species provide good snail kite foraging habitat, as long as the vegetation is not too dense to locate apple snails. Approximately 14,000 acres of FEB and 3,000 acres of agricultural lands would be converted to a 10,500 acre deep water storage reservoir and an approximately 6,500 acre A-2 STA. The 14,000 acre FEB conversion of uplands to wetlands were discussed in the CEPP 2013 BA, while this TSP proposes to convert those same 14,000 acres to 10,500 acres to a deep water reservoir, and 3,500 to a STA. An additional 3,000 acres of upland conversion to wetlands/deep water reservoir is proposed beyond the 2013 CEPP BA in this TSP. Conversion of uplands to treatment wetlands and reservoir in the A-2 STA would provide decreases in the frequency and duration of extreme low lake stages in Lake Okeechobee, which may increase suitable habitat for apple snails, thereby increasing spatial extent of suitable foraging opportunities for snail kites, providing a minor beneficial effect. Emergent wetland habitat within the proposed A-2 STA has potential to provide foraging opportunities and nesting and roosting habitat for Everglade snail kite. Other SFWMD STAs exhibit significant numbers of foraging and nesting Everglade snail kites; in addition, Everglade snail kites were recently observed in the A-1 FEB in 2014 and 2015 during construction monitoring (SFWMD, personal communication).

Increased noise levels and traffic from construction and post-construction maintenance and operational activities within the A-2 STA and A-2 Reservoir sites could result in a higher risk of direct mortality; however, since Everglade snail kites do not typically forage along roadways, increased traffic is not expected to cause an unacceptable adverse effect.

Based on the above discussion, the construction and operation of the A-2 STA and A-2 Reservoir may affect, but is not likely to adversely affect, Everglade snail kite.

5.4 WOOD STORK

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. No critical habitat has been designated for the wood stork.

In the United States, wood storks were historically known to nest in all coastal states from Texas to South Carolina (Wayne 1910; Bent 1926; Howell 1932; Oberholser 1938). 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. Currently, wood stork nesting is known to occur in Florida, Georgia, South Carolina, and North Carolina from March to late May. However, in south Florida, wood storks lay eggs as early as October and fledge in February or March. Breeding colonies of wood storks are currently documented in all southern Florida counties except for Okeechobee County. Known nesting colonies are shown in **Figure 5-5**.

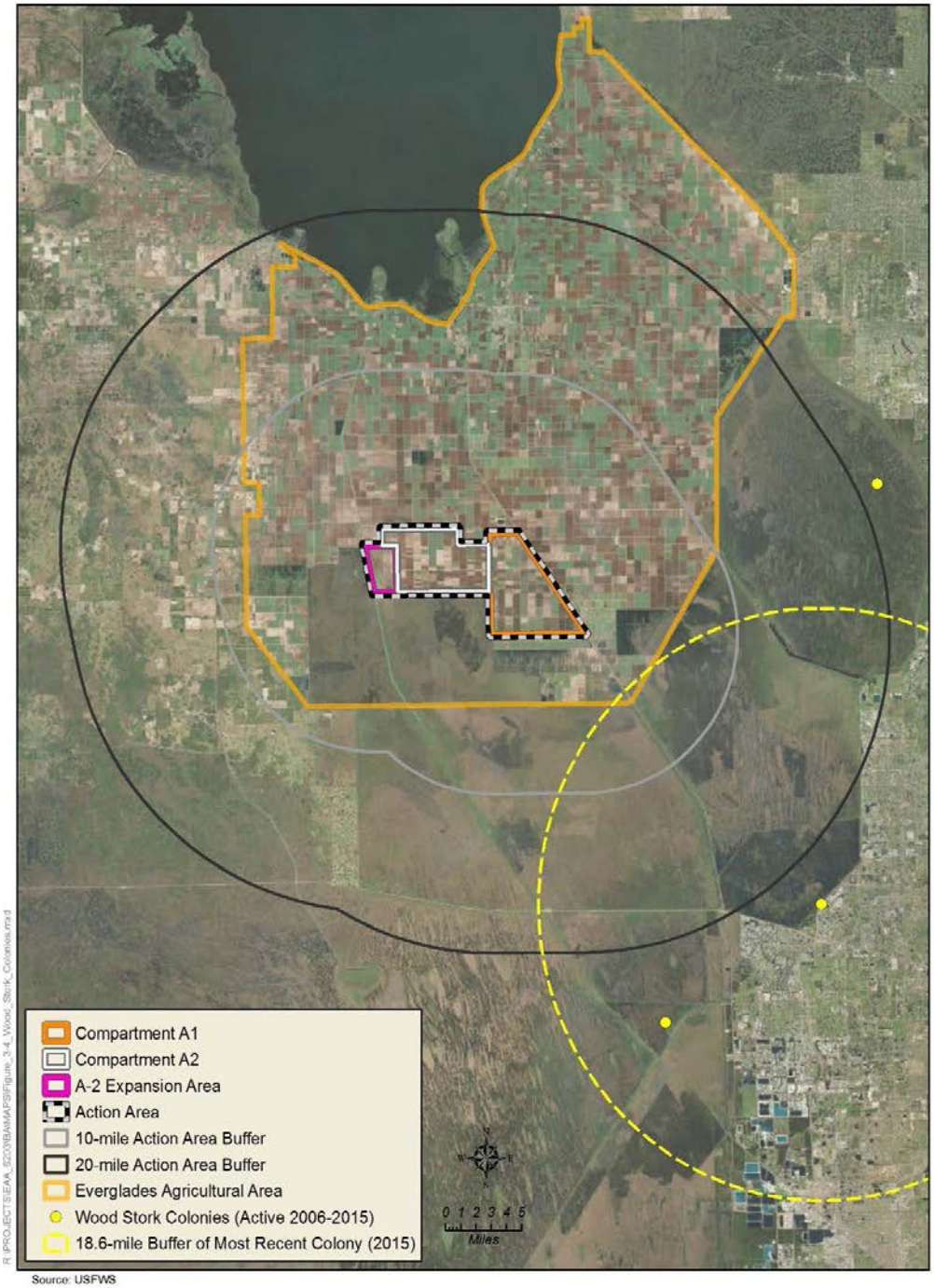


Figure 5-5. Active Wood Stork Colonies in the Vicinity of the SFWMD A-2 STA and A-2 Reservoir between 2006 and 2015.

The wood stork population in the southeastern United States appears to be increasing. Preliminary population totals indicate that the wood stork population has reached its highest level since it was listed as endangered in 1984. In all, approximately 11,200 wood stork pairs nested within their breeding range in the southeastern United States. Wood stork nesting was first documented in North Carolina in 2005 and wood storks have continued to nest in this state since that time. This suggests that the northward expansion of wood stork nesting may be continuing.

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.

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 et al. 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.

5.4.1 Wood Stork Effect Determination

The nearest active wood stork colony is located over 20 miles east of the project (**Figure 5-5**), but wood storks have been observed within the A-2 STA and A-2 Reservoir project site. Wood storks typically forage within 5 miles of their colonies; given the proximity of the known colonies to the SFWMD TSP Project Area, wood storks would not likely forage within the SFWMD EAA Southern Reservoir and STA project area. Wood storks were last seen within the A-1 parcel of the project on January 31, 2017 (eBird 2017c), and within the A-2 parcel of the project on August 30, 2014 (eBird 2017a). Wood storks were also observed just outside the eastern boundary of the A-1 parcel on U.S. Route 27 on January 17, 2015 (eBird 2017b). Construction monitoring conducted for the A-1 FEB documented presence of wood stork within the A-1 parcel of the project on several occasions in 2014.

Indirect effects associated with construction and operations of the A-2 reservoir and A-2 STA include an increase in traffic and noise levels. Construction activities and noise associated with the proposed work are not expected to adversely affect the wood stork. Because storks are mobile, an increase in traffic in the area is not expected to cause a measurable risk. It is not anticipated that wood storks would be adversely affected by noise and traffic.

Direct effects from construction of the A-2 reservoir and A-2 STA could occur as a result of conversion of approximately 14,000 acres of FEB and 3,000 acres of agricultural habitat to open water reservoir and STA habitat. Anticipated direct effects from construction of the 10,500 acre A-2 Reservoir would decrease foraging opportunities. However, creation of the additional 3,000 acres of land from agriculture to the A-2 STA would potentially offset the effects of the deep water reservoir by increasing the aquatic foraging habitat available. As discussed in the sections above, the 2013 CEPP BA discussed and analyzed the conversion of 14,000 acres of agriculture within the A-2 parcels to wetland habitat, which was a benefit to foraging wood storks. This TSP proposes to convert 10,500 acres (of the 14,000) to a deep water reservoir, and 3,500 acres to treatment wetlands (STA). In addition to the CEPP features, this TSP

proposes to convert 3,000 acres will from upland agricultural habitat to treatment wetlands. The conversion of a relatively shallow 14,000 acre FEB to a 10,500 acre deep reservoir will reduce wood stork foraging opportunities that CEPP was going to provide within the A-2 footprint. This TSP includes 6,500 acres of treatment wetlands, which slightly offsets the deep water reservoir effects by providing potential foraging habitat within the STA. The reduction in high lake levels within Lake Okeechobee may also improve the littoral habitat within Lake Okeechobee, thereby potentially increasing foraging suitability within Lake Okeechobee.

Based upon the discussion, and the availability of wood stork to forage within the STA, the Corps has determined that the TSP may affect, but is not likely to adversely affect, wood stork.

5.5 FLORIDA PANTHER

The endangered Florida panther, also known as cougar, mountain lion, puma and catamount, was once the most widely distributed mammal (other than humans) in North and South America, but it is now virtually exterminated in the eastern United States. Habitat loss had driven this subspecies south of the Caloosahatchee River in central Florida. Only recently have adult female panthers been recorded north of the Caloosahatchee River. The Florida panther has been found in almost all Lake Okeechobee watershed ecological communities, including mesic temperate hammocks (Humphrey 1992). The Florida panther utilizes mesic pine flatwoods in combination with other forested communities. Foraging, breeding, and wildlife corridors are provided for the panther and its prey. Mesic flatwoods are associated with natural drainage patterns defining travel corridors.

One of 30 cougar subspecies, the 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. Present population estimations range from 80 to 100 individuals. 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. Florida panther primary, secondary, and dispersal zones are shown in **Figure 5-6,** however, there is no designated critical habitat for the Florida panther.

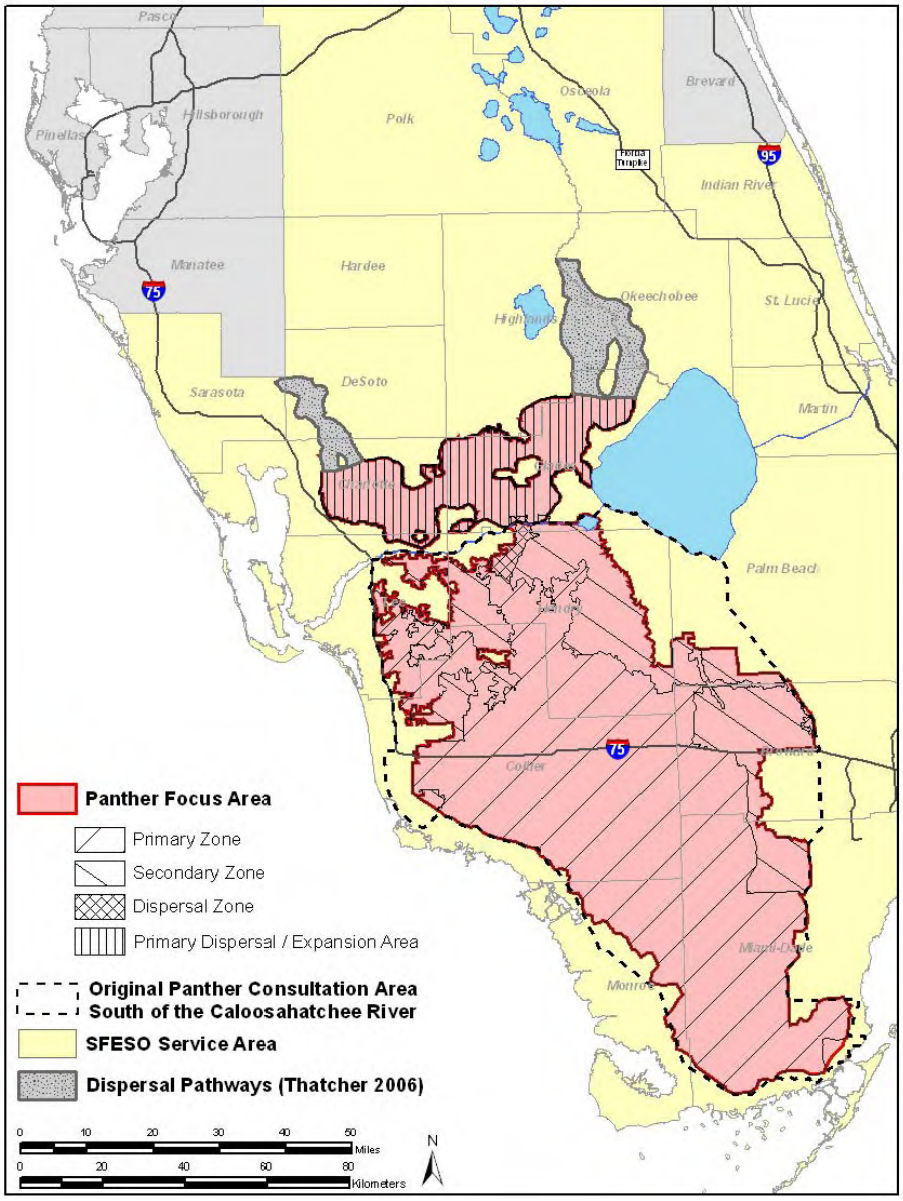


Figure 5-6. Florida panther zones in South Florida.

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 (USFWS 1999).

Some areas of the primary and secondary Florida panther management zones are located within the A-2 STA and A-2 Reservoir project areas. There are small portions of both zones in the A-2 Expansion area (25.1 acres of primary management zone, and 5.9 acres of secondary management zone). Additional primary and secondary habitat management zone areas abut the project site to the south and west.

Florida panther have been observed in the A-2 STA and A-2 Reservoir project areas, having been documented on several occasions within the A-1 FEB project in 2014 and 2015 during construction monitoring (SFWMD, personal communication). Telemetry data have recorded a Florida panther along the western boundary of the A-2 Expansion area **(Figure 5-7**), and there have been two documented Florida panther mortalities, south of the project area, within the 10-mile buffer area of the project.

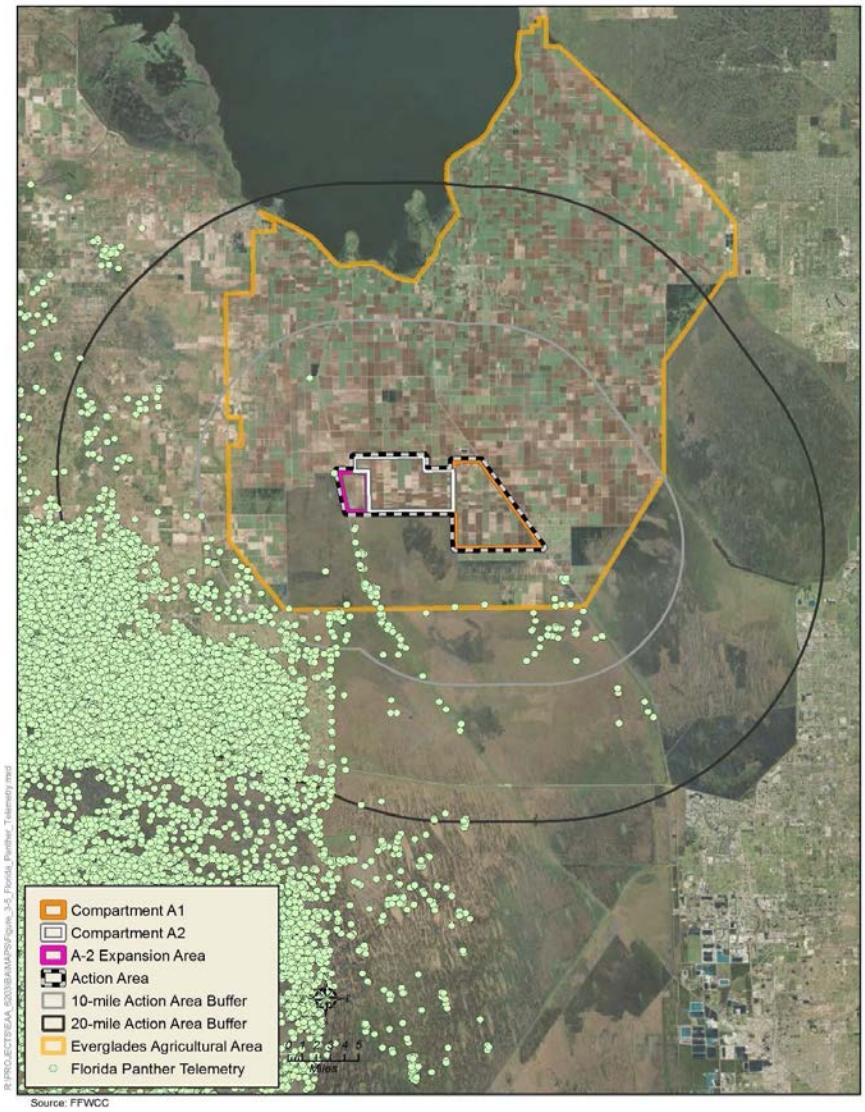


Figure 5-7. Florida Panther Telemetry from 1981-2005.

5.5.1 Florida Panther Effect Determination

Florida panther may utilize the project site as noted on the panther telemetry data for 1981–2005 (**Figure 5-7**), including areas directly adjacent to the project site and in STA 3/4, WCA 3A, and Holey Land Wildlife Management Area (USACE 2013). Panthers may hunt on the project site, but it is unlikely that they would use these areas for any extended length of time because of the lack of suitable long-term panther habitat (URS Corporation 2007). Panthers have not been observed on the project site; however, they have been documented to occur within 10 miles of the project.

Adverse, direct effects, which are primarily habitat based, include the permanent loss and fragmentation of Florida panther habitat. The change from the CEPP A-2 FEB to the SFWMD Section 203 A-2 Reservoir removes approximately 10,500 acres of potential wetlands for the panthers to forage within and traverse through to other suitable habitat. Current habitat quality of the additional 3,000 acres of upland conversion within the A-2 Reservoir and A-2 STA footprint is generally poor, as it is primarily composed of agricultural lands and wetland communities dominated by nuisance and exotic plant species. Direct effects associated with the conversion from the CEPP A-2 FEB to a 10,500 acre deep A-2 Reservoir include permanent loss and fragmentation of habitat that supports panther prey. The TSP proposes to convert the remaining 3,500 acres, plus an additional 3,000 acres to an A-2 STA, which may slightly offset the effects of the deep water reservoir. However, the STA is still a conversion of upland habitat, which is ideal for the panther. In addition, due to the relative proximity of other areas of suitable habitat that are already in conservation, the direct effects associated with the conversion from the A-2 FEB to the deep reservoir may be offset.

Indirect effects to panthers include increased traffic levels, increased noise disturbance and reduction in value of panther habitat adjacent to the project due to habitat fragmentation. In past years, several road kills have occurred on County Road 835/833 as a result of vehicles entering in and off the project boundaries. Project construction will result in increased traffic consisting of heavy equipment and construction vehicles, and an increase in traffic traveling to and from the site. There is a risk that a panther may get struck by a vehicle. However, all vehicles would be required to adhere to the posted speed limits for off-road and improved-road travel. Effects associated with construction traffic would be localized due to construction occurring in phases such that panthers can avoid the areas that are undergoing construction. Additionally, all entrances to the project area would be secured with gates to control access. Noise levels also would be localized as the different phases are under construction. The increase in noise levels is not expected to cause an unacceptable risk to the Florida panther.

Direct effects to panthers may result from the construction of the A-2 STA and A-2 Reservoir that would occur from conversion of approximately 14,000 acres of FEB habitat to 10,500 acres of deep water reservoir and 3,500 acres of treatment wetlands, and 3,000 acres of upland agricultural habitat to treatment wetlands. The upland areas within the A-2 parcels could have been used by Florida panther to forage and transverse the area. Conversion of the FEB to a deep water reservoir would eliminate some potential for panther to traverse the area in this region; panthers would not be able to traverse or hunt through the lands converted to a reservoir. The A-2 STA and A-2 Reservoir would reduce potential habitat for feral hogs and white-tailed deer on the project site, which are two main prey items for the panther. Although the current habitat is not ideal for panther foraging, the conversion could decrease the hunting ability of the panther. The berms and levees would provide potential hunting habitat, and also provide corridors for traveling. The 6,500 acre A-2 STA would not negatively affect the panther as they would still be able to traverse the levees within the STA, however, it is still removal of upland area for prey species. Based on the information outlined above, the Corps has determined that the construction and operation of the A-2 STA and A-2 Reservoir may affect Florida panther.

6 CONSERVATION MEASURES

The Corps commits to minimizing effects of the SFWMD proposed action to the greatest extent possible in both the planning and construction phases of the project:

1) Standard protection measures regarding the eastern indigo snake, wood stork, and caracara shall be included in the environmental protection plan when the Corps proceeds to the plans and specifications phase of this project.

2) Turbidity screening and diversion will be used to control effects to the drainage ditches and connected canals. Runoff from the construction site or storms shall be controlled, retarded, and diverted to protected drainage courses by means of diversion ditches, benches, and any measures required by area wide plans approved under paragraph 208 of the Clean Water Act. Temporary and permanent erosion and sedimentation control features or screening will be installed.

3) In addition, during construction, the Contractor will be responsible for keeping construction activities, including refueling and maintenance sites, under surveillance, management, and control to avoid pollution of surface, ground waters, and wetlands. The Contractor is responsible for conducting all operations in a manner to minimize turbidity and shall conform to all water quality standards as prescribed by Chapter 62-302, State of Florida, FDEP.

4) Project construction shall not destroy migratory birds, their active nests, their eggs, or their hatchlings. Monitoring for such would be required by the construction contractor. A buffer zone around active nests or nestling activity would be required during the nesting season.

If the SFWMD Section 203 EAA Southern Reservoir and STA Project is approved by Congress and results in a modification (Post Authorization Change Report) to the 2014 authorized CEPP, the Corps would then potentially propose to use panther credits in the Picayune Strand Restoration Project to offset the loss of habitat due to the additional 3,000 acres of conversion of upland habitat to a deep water storage and treatment wetlands. Applicable listed species guidelines and conservation measures will be followed and coordinated with USFWS as appropriate. The Corps would implement construction conservation measures for panther, caracara, wood stork, and Eastern indigo snake as outlined in their respective conservation measures and guidelines from the USFWS to avoid and minimize adverse effects on those species during construction activities. Monitoring for listed species that could occur in or around the project area during construction would be specified in the contract specifications.

7 CONCLUSIONS

The Corps acknowledges the probable existence of federally-listed threatened or endangered species within the boundaries of the SWMFD Section 203 EAA Southern Reservoir and STA Project action area. This BA was prepared with the best available scientific and commercial information, including the SFWMD draft report (Appendix A) to determine potential effects on listed species.

This BA analyzed the conversion the 2013 CEPP BA feature of a 14,000 acre shallow FEB (A-2) to 10,500 acres of deep water reservoir and 3,500 acres of treatment wetlands. In addition, 3,000 acres of additional upland agricultural land and low quality wetlands are proposed to be converted to treatment wetlands (A-2 STA) in this TSP. The project area does not currently support caracara habitat, while conversion of

the land to reservoir and wetlands also will not likely benefit or effect caracara. Emergent wetland habitat within the proposed A-2 STA has potential to provide foraging opportunities and nesting and roosting habitat for Everglade snail kite, as indicated by their use in the A-1 FEB. The TSP will remove potential foraging habitat for wood stork by converting the A-2 FEB to a deep water reservoir, however, conversion of a portion of the A-2 parcel to treatment wetlands may allow for foraging activities to occur on the A-2 parcels. The Corps has determined that the TSP may affect, but will not likely adversely affect caracara, wood stork, and Everglade snail kite. The TSP will result in a loss of upland habitat for the Eastern indigo snake and Florida panther, and therefore the Corps has determined that the TSP may affect these species. Eastern indigo snakes currently inhabit the additional 3,000 acres of EAA agricultural fields, which are used for sugar cane production. Soils in this area are hydric (wetland) soils that will support wetlands, which is not typically the type of area the snakes are found in. Eastern indigo snakes would still have relatively large areas of undeveloped and agricultural land in the EAA to maintain their population. Florida panther would be unable to traverse the deep water reservoir and foraging opportunities would be removed by converting an additional 3,000 acres of upland habitat to treatment wetlands. The panther could use the levees and berms within the STAs to traverse the land, however, prey is not expected to be supported by the conversion of uplands to reservoir and STA.

The Corps recognizes the need for re-initiation of consultation if modifications to the project are made and/or additional information involving potential effects to listed species become available. The Corps commits to maintain ongoing communications with the FWS, NMFS, and FFWCC in the event of project modifications. This document is being submitted for formal consultation with the USFWS pursuant to Section 7 of the ESA.

8 LITERATURE CITED

Bent, A.C. 1926. Life histories of North American marsh birds. U.S. Natl. Mus. Bull. 135

Browder, J.S., C. Littlejohn, and D. Young. 1976. The Florida Study. Center for Wetlands, University of Florida, Gainesville, and Bureau of Comprehensive Planning, Florida Department of Administration, Tallahassee.

Browder, J. A., V. R. Restrepo, J. Rice, M. B. Robblee, Z. Zein-Eldin. 1999. Environmental influences on potential recruitment of pink shrimp, Farfantepenaeus duorarum, from Florida Bay nursery grounds. Estuaries 22(2B):484-499.

Browder, J.S., P.J. Gleason, and D.R. Swift. 1994. Periphyton in the Everglades: spatial variation, environmental correlates, and ecological implications. Pages 379-418, in Everglades: The Ecosystem and Its Restoration, S.M. Davis and J.S. Ogden (Eds.). St. Lucie Press, Delray Beach, Florida, USA.

Coulter, M.C. and A.L. Bryan, Jr. 1993. Foraging ecology of wood storks (*Mycteria americana*) in east central Georgia: Characteristics of foraging sites. Colonial Waterbirds 16:59-70.

Coulter, M.C., J.A. Rodgers, J.C. Ogden, and F.C. Depkin. 1999. Wood stork (Mycteria americana). In The Birds of North America, No. 306, A. Poole and F. Gill (Eds.). Academy of Natural Sciences, Philadelphia, Pennsylvania and American Ornithologists' Union, Washington, D.C., USA.

Dahl, T.E. 1990. Wetlands losses in the United States 1780s to 1980s. U.S. Department of the Interior, Fish and Wildlife Service; Washington, D.C

eBird. 2017a. eBird. 2017a. Hotspot Map – Everglades Agricultural Area. Available online at: http://ebird.org/ebird/hotspot/L2275821. Accessed December 19, 2017.

eBird 2017b. US 27 Tower S of South Bay. Available online at: http://ebird.org/ebird/hotspot/L578819. Accessed December 19, 2017.

eBird 2017c. Wood Stork. Available online at: http://ebird.org/ebird/map/woosto?neg=true&env.minX=-81.17660522460937&env.minY=26.242000737764638&env.maxX=-80.2386474609375&env.maxY=26.58207966607352&zh=truegp=false&ev=Z& mr=1-12&bmo=1&emo=12&yr=all&byr=1900&eyr=2017 . Accessed December 19, 2017.

Duellman, W.E. and A. Schwartz. 1958. Amphibians and reptiles of southern Florida. Bulletin Florida State Museum, Biological Science 3:181-324.

Fertl, D., A.J. Schiro, G.T. Regan, C.A. Beck, N.M. Adimey, L. Price-May, A. Amos, G.A.J Worthy, and R. Crossland. 2005. Manatee occurrence in the Northern Guld of Mexico, west of Florida. Gulf and Caribbean Research 17:69-74.

Florida Fish and Wildlife Conservation Commission. 2011. http://myfwc.com/media/2273295/Florida-Bonneted-Bat-BSR.pdf

FFWCC (Florida Fish and Wildlife Conservation Commission). No date. Eastern indigo snake. Available online at: http://myfwc.com/wildlifehabitats/imperiled/profiles/reptiles/eastern-indigo- snake/. Accessed December 14, 2017.

FFWCC . 2017c. Audubon's crested caracara. Available online at: http://myfwc.com/wildlifehabitats/imperiled/profiles/birds/audubons-crested- caracara . Accessed December 19, 2017.

Gawlik, D.E., 2002. The effects of prey availability on the numerical response of wading birds. Ecological Monographs 72(3): 329-346.

Gawlik, D. E., G. Crozier, K. H. Tarboton. 2004. Wading bird habitat suitability index. Pages 111-127, *In* K. C. Tarboton, M. M. Irizarry-Ortiz, D. P. Loucks, S. M. Davis, and J. T. Obeysekera. Habitat suitability indices for evaluation water management alternatives. Technical Report, South Florida Water Management District, West Palm Beach, FL.

Hefner, J.M., B.O. Wilen, T.E. Dahl, W.E. Frayer. 1994. Southeast wetlands: Status and trends, mid-1970s to mid-1980s. U>s. Department of the Interior, Fish and Wildlife Service; Atlanta, Georgia.

Herring, G. and D. E. Gawlik. 2007. Multiple nest-tending behavior in an adult female white ibis. Waterbirds 30:150-151.

Moler, P.E. 1992. Eastern indigo snake. Pages 181-186. In P.E. Moler, ed. Rare and endangered biota of Florida, volume III, Amphibians and Reptiles. University Press of Florida; Gainesville, Florida.

Morrison, J.L. 1996. Crested Caracara. In The Birds of North America, No. 249 (A. Poole and F. Gill, eds.).

The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington D.C.

Morrison, J.L. and S.R. Humphrey. 2001. Conservation value of private lands for Crested Caracaras in Florida. Conservation Biology 15:675-684.

Oberholser, H.C. 1938. The bird life of Louisiana. Louisiana Department of Conservation, Bulletin 28.

Ogden, J.C. and S.A. Nesbitt. 1979. Recent wood stork population trends in the United States. Wilson Bulletin 91(4):512-523.

Ogden. John C. 1994. A comparison of wading bird nesting colony dynamics (1931-1946 and 1974-1989) as an indication of ecosystem conditions in the southern Everglades in, "Everglades the Ecosystem and its Restoration", eds,. Davis, S.M. and J.C. Ogden. pps. 533- 570.

Ogden, J.C., J.A. Kushlan, and J.T. Tilmant. 1976. Prey selectivity by the wood stork. Condor 78(3):324 330.

Ogden, J.C., J.A. Kushlan, and J.T. Tilmant. 1978. The food habits and nesting success of wood storks in Everglades National Park in 1974. U.S. Department of the Interior, National Park Service, Natural Resources Report No. 16.

Ogden, J.C., 1991. Nesting by wood storks in natural, altered, and artificial wetlands in central and northern Florida. Colonial Waterbirds 14:39 45.

Schaefer, J. and J. Junkin. 1990. The Eastern Indigo Snake: A Threatened Species. University of Florida, Florida Cooperative Extension Service. Publication SS-WIS-24, Gainesville, Florida, USA.

Steiner, T.M., O.L. Bass, Jr., and J.A. Kushlan. 1983. Status of the eastern indigo snake in southern Florida national parks and vicinity. South Florida Research Center Report SFRC-83/01. Everglades National Park, Homestead, Florida, USA.

URS Corporation. 2007. Final Basis of Design Report for Compartment C Build-out, October 2007. Prepared for the SFWMD, West Palm Beach, Florida.

USACE 2013. Central Everglades Planning Project Endangered Species Act Biological Assessment dated August 5, 2013. Prepared by the Department of the Army U.S. Corps of Engineers, Jacksonville District

USACE. 2014. Comprehensive Everglades Restoration Plan Central Everglades Planning Project Final Integrated Project Implementation Report and Environmental Impact Statement. U.S. Army Corps of Engineers, Jacksonville District. July 2014.

U.S. Fish and Wildlife Service. 1999. South Florida Multi-Species Recovery Plan. Southeast Region, Atlanta, Georgia, USA.

USFWS 2004. South Florida Ecological Services Office. Draft Species Conservation Guidelines South Florida. Audubon's Crested Caracara. April 20, 2004. Available online at: https://www.fws.gov/verobeach/BirdsPDFs/2004SpeciesConservationGuidelines CaracaraALLINCLUSIVE.pdf?spcode=A003. Accessed December 12, 2017.

Wayne, A.T. 1910. Birds of South Carolina. Contributions to the Charleston Museum No. 1