APPENDIX A

MODIFICATIONS TO THE C-111 SOUTH DADE PROJECT, L-31W

BIOLOGICAL ASSESSMENT

U.S. FISH AND WILDLIFE SERVICE

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
701 San Marco Boulevard
JACKSONVILLE, FLORIDA 32207-8175

REPLY TO
ATTENTION OF

JUN 30 2016

Planning and Policy Division
Environmental Branch

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, as amended, the U.S. Army Corps of Engineers (Corps) is communicating a Biological Assessment with the U.S. Fish and Wildlife Service (USFWS) for construction activities under C-111 Project, Contract 9. The reason for interagency coordination is a new Environmental Assessment for proposed deposit of fill or plugs in the L-31W Canal, in the area surrounding the old "Frog Pond" borrow canal. The new Environmental Assessment will begin to circulate beginning on July 1, 2016.

The location of the C-111 Canal Contract 9 actions is around the S-332 Detention Area (Figure 1). The dual purposes of the C-111 Project (habitat improvement and seepage reduction) have not changed.

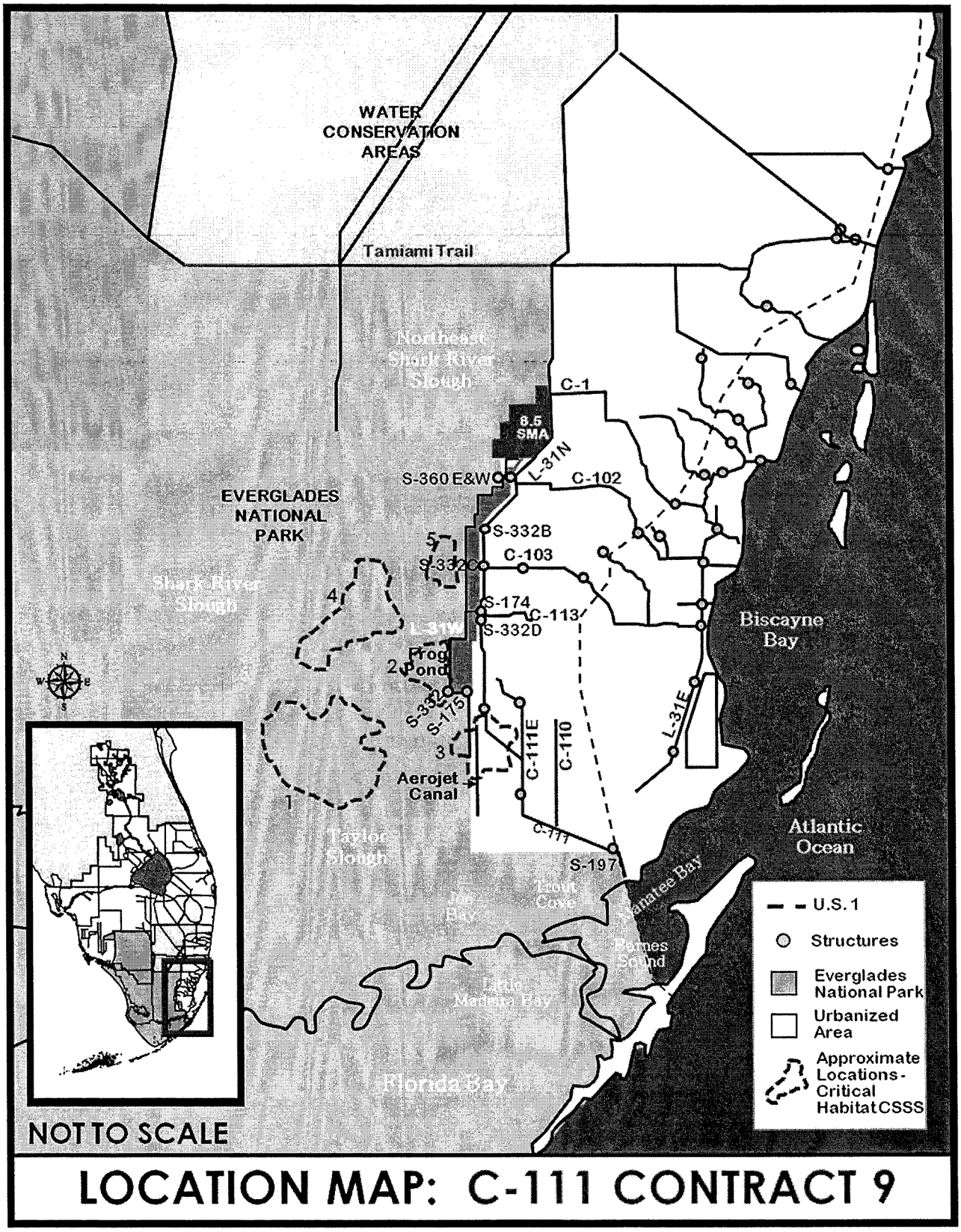
The Corps has prepared a Biological Assessment for endangered or threatened species on the corrected list you communicated with us in June, 2016. If you have any questions concerning the project, please contact Ms. Barbara Cintron by email at Barbara.B.Cintron@usace.army.mil, or by telephone at 904-232-1692. Thank you for your assistance in this matter.

Sincerely,

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

Enclosure

Copies Furnished:
Kevin Palmer, U.S. Fish & Wildlife Service, South Florida Ecological Services Office, 1339 20th Street, Vero Beach, Florida 32960-3559



LOCATION MAP: C-111 CONTRACT 9

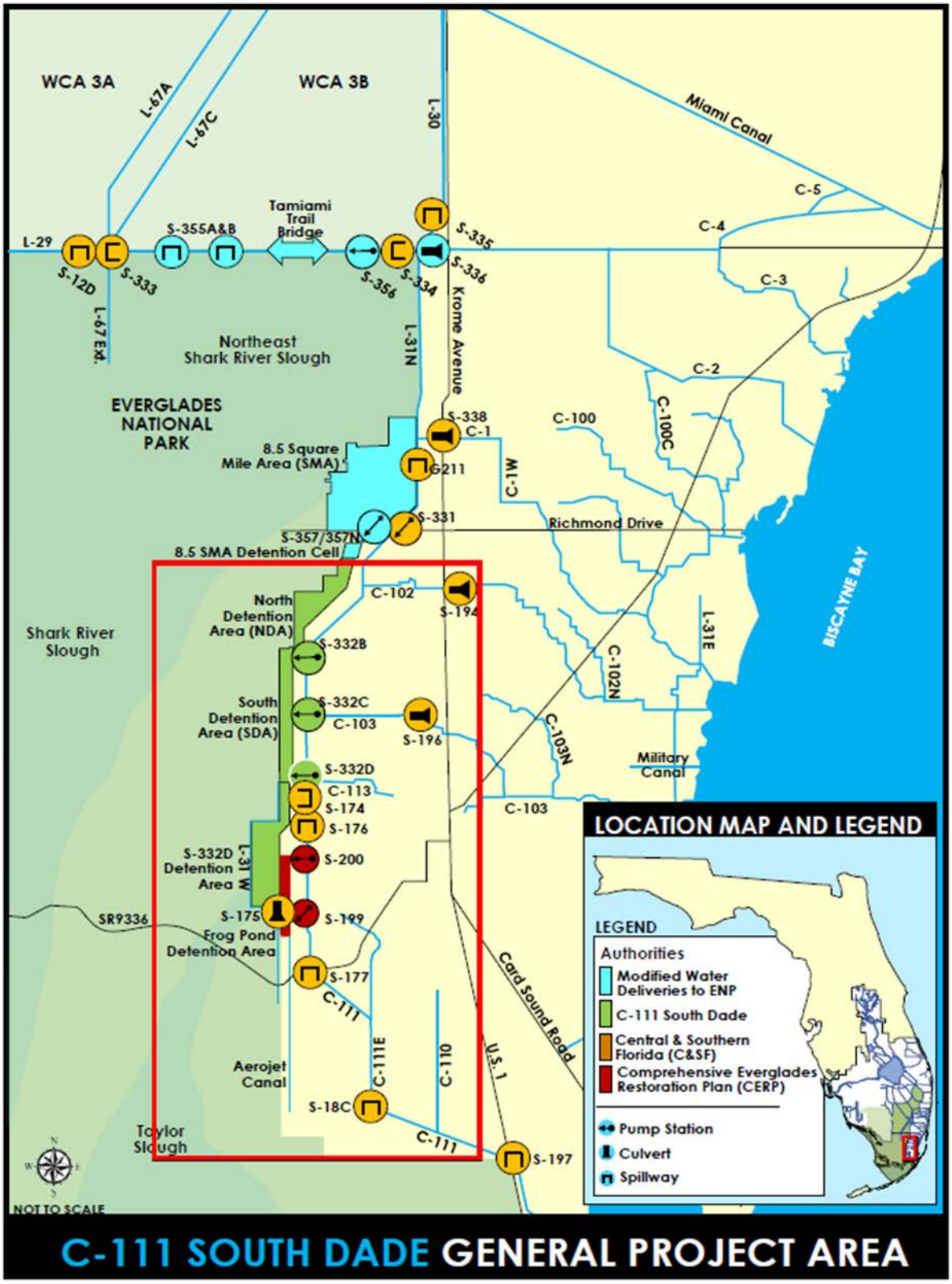
1 PROJECT AUTHORITY

The C-111 South Dade Project was built as part of the Everglades National Park–South Dade Conveyance Canals Project authorized by the Flood Control Act (FCA) of 1968 (Public Law (PL) 90-483). This Act authorized modifications to the existing Central and Southern Florida (C&SF) Project as previously authorized by the FCAs of 1948 (PL 80-858) and 1962 (PL 87-874). The original purpose of the C-111 Canal project was to reduce or mitigate flooding in the agricultural drainage basin immediately east of ENP, to provide agricultural and other water supply, and to favor habitat restoration in the Park. Further modifications to the C-111 as described in the 1994 GRR were authorized as part of the C&SF Project in the Water Resources Development Act (WRDA) of 1996 (PL 104-303). As the ENP expanded, The 1994 GRR/EIS added an expanded purpose of restoration of the ecosystem of Taylor Slough and eastern ENP, largely in response to the 1989 Everglades National Park Protection and Expansion Act, which authorized acquisition of the 109,000 acres of ENP from approximately the location of the L-67 Extension Levee/Canal eastward to the current ENP boundary. In the early 1990s it was recognized that it was no longer desirable to drain lands directly adjacent to ENP. Rather, it was desirable to maintain their wetland character, while maintaining flood damage reduction on adjacent agricultural and residential lands in the eastern basin. The 1994 GRR described a conceptual plan for five pump stations and a levee-bounded water retention/detention area (currently referred to as the C-111 South Detention Area, or SDA) to be built west of the L-31N East Coast Protective Levee and the adjacent L-31N Borrow Canal, extending between the current C-111 South Detention Area and the S-332D Detention Area to its south. Prior to 2015 the last USACE consultation on C-111 construction was for completing construction of the NDA and SDA water retention areas, which would generate a localized "mound" or "hydrologic ridge" of water and thereby reduce seepage out of ENP, with the inflow pump stations operated to maintain target L-31N Canal stages and maintain the pre-project flood protection to agricultural lands east of the L-31N Canal. Early in 2016 the Corps consulted on flow-ways and other features to facilitate connection of the "Mod Waters" and C-111 South Dade Projects. The current construction under evaluation, to be built under Contract 9, is installation of plugs in L-31W Canal and narrowing of the gap on the west side of the S-332D Detention Area (the old "Frog Pond").

2 PROJECT LOCATION

Figure 1 shows the location of the C-111 South Dade Project located in Miami-Dade County. The construction area under this consultation is located south of the previous construction EA, along the L-31W Canal segments surrounding the S-332D Detention Area (the old "Frog Pond Agricultural Area") and points south of S-175, north and south of the ENP entrance road. It is south of the actions described in the previous consultation, beginning at the S-332D structure.

Figure 1. C-111 L31 W Location Map



3 PROJECT PURPOSE AND NEED

The purpose of the proposed construction described in this EA is to create a series of plugs in L-31W Borrow Canal that would stop southward flow along the Canal and inhibit seepage out of the eastern boundary of ENP into the Canal. It also recommends narrowing the gap located N of the S-332 pump station and raising the sill at the remaining gap by two feet. Construction of plugs and gap narrowing is expected to retain or restore favorable (longer) hydroperiods within ENP while maintaining flood protection for areas east of the L-31N and C-111 Canals.

4 PROJECT AND CONSULTATION BACKGROUND

The U.S. Army Corps of Engineers (Corps) initiated informal consultation with the U.S. Fish and Wildlife Service (FWS) under the Endangered Species Act for C-111 South Dade Contract 9 in May, 2015. A species list was provided, with which the Service concurred in June, 2015. Several months passed and the L-31W Canal backfilling actions were postponed and removed from documentation under the ongoing consultation, which instead described recommended modifications to the NDA and SDA Detention Cells, and their connection to the Modified Water Delivery Project, along with removal or decommissioning of some non-functioning structures, including S-174, S-175, L-327 weir, S-332 and S-332i. USACE re-initiated consultation with the Service in September 2015 for the list of species, receiving updates on newly listed species and confirmation of the list in October, 2015. Finally, a Complete Initiation Package and Biological Assessment for this EA, called *"C-111 South Dade Project, Modifications to the North and South Detention Areas"* was sent to FWS on January 26, 2016. On March 30, 2016, FWS concurred with the Assessment, suggesting in the future that all plant species, for which there is no habitat on lands of the project, be assigned a "No Effect" asssessment, and that the Florida Bonneted Bat's assessment be changed from "No Effect" to "May Affect but Not Likely to Adversely Affect", due to absence of bat roosting habitat on project lands and absence of sighting records in the vicinity.

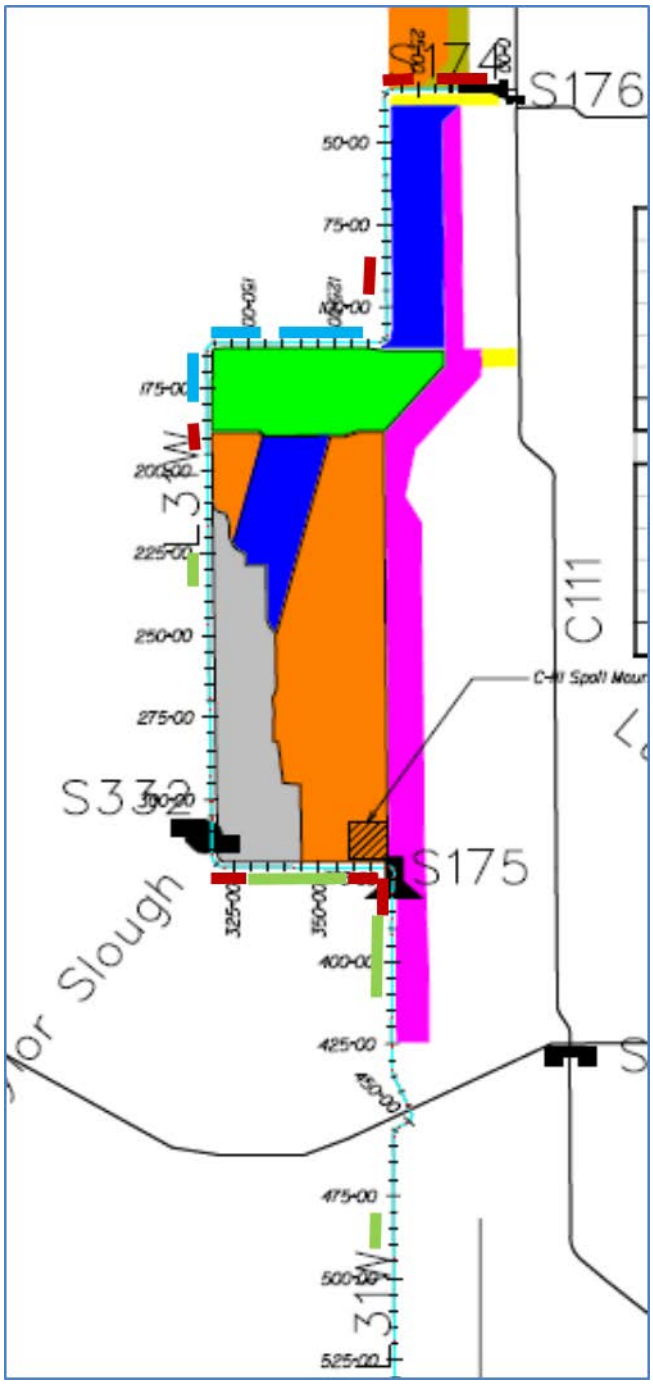
The starting point for this Biological Assessment is a request for confirmation of the species list, sent by USACE to FWS on May 18, 2016. A corrected list was received from FWS on June 6, 2016.

5 PROPOSED ACTION

This Biological Assessment addresses only construction features, with the assumption of current operations. Proposed actions under this assessment include construction of canal plugs beginning west of S-174 (which is to be degraded), continuing down L-31 Canal to and past S-175, to a location South of the ENP entrance road. Recommended plug locations are indicated on the attached map, labeled as Fig. 2. Exact length of the plugs is still to be determined but fill of the canal in all locations will not be complete. Each plug will be at least 1,000 feet long. Plug placement and lengths reflect interagency consultation among SFWMD, ENP and FWS; total volume of placement will depend in part on cost determinations and project cost limits. In the map graphics red lines represent areas of highest potential seepage and therefore highest priority. Hatch marks indicate stationing, beginning at the north at S-174. Blue segments are areas where ENP staff have measured high seepage; green lines indicate other seepage areas of lower priority. While there appears to be sufficient fill available to construct all the plugs shown, cost may be a

constraint. Two areas along L-31W where the initial Canal construction bisected large tree islands will not be altered. These areas still support trees and woody vegetation, represent better than average habitat for wildlife, and will not be disturbed.

Fig. 2. Map of the segments of L-31W proposed for plugging. Plug locations are shown by colored lines. Red lines are highest priority.



6 EFFECT DETERMINATIONS ON INDIVIDUAL SPECIES FOR THE PROPOSED PROJECT

The Corps initiated informal consultation under the ESA by requesting written confirmation of a table of federally listed threatened and endangered species that are known to occur or likely to occur within Miami-Dade County from the U.S. Fish and Wildlife Service (USFWS) by letter dated May 18, 2016. Concurrence and corrections of the list and notification of State Species of Special Concern was received on June 4, 2016. Table 1 indicates the listed species, including some under primary jurisdiction of the National Marine Fisheries Service (NMFS). The determinations in Table 1 are based on the limited scope (size) of the project, the degraded quality of the Canal aquatic habitat, and available information about species' behavior and habitat requirements. Species are discussed individually after the table of determinations.

Table 1. Federally Threatened and Endangered Species Within The Miami-Dade County Area And Effects Determination Of The Proposed Action

Common Name	Scientific Name	Status	May Affect, Likely to Adversely Affect	May Affect, Not Likely to Adversely Affect	No Effect
Mammals					
Florida panther	*Puma concolor coryi*	E		X	
Florida manatee	*Trichechus manatus latirostris*	E, CH			X
Florida bonneted bat	*Eumops floridanus*	E		X	
Birds					
Cape Sable seaside sparrow	*Ammodramus maritimus mirabilis*	E, CH		X	
Everglade snail kite	*Rostrhamus sociabilis plumbeus*	E, CH			X
Piping plover	*Charadrius melodus*	T			X
Red-cockaded woodpecker	*Picoides borealis*	E			X
Roseate tern	*Sterna dougallii dougallii*	T			X
Wood stork	*Mycteria americana*	T			X
Reptiles					
American Alligator	*Alligator mississippiensis*	T, SA			X
American crocodile	*Crocodylus acutus*	T, CH			X
Eastern indigo snake	*Drymarchon corais couperi*	T		X	
Green sea turtle*	*Chelonia mydas**	E			X
Hawksbill sea turtle*	*Eretmochelys imbricata**	E			X
Kemp's Ridley sea turtle*	*Lepodochelys* kempii*	E			X

Leatherback sea turtle*	*Dermochelys coriacea**	E			X
Loggerhead sea turtle*	*Caretta caretta**	E			X
Fish					
Smalltooth sawfish*	*Pristis pectinata**	E, CH			X
Invertebrates					
Bartram's hairstreak butterfly	*Strymon acis bartrami*	E			X
Elkhorn coral	*Acropora palmata**	T, CH			X
Florida leafwing butterfly	*Anaea troglodyta floridalis*	E			X
Miami blue butterfly	*Cyclargus thomasi bethunebakeri*	E			X
Schaus swallowtail butterfly	*Heraclides aristodemus ponceanus*	E			X
Staghorn coral*	*Acropora cervicornis**	T, CH			X
Stock Island tree snail	*Orthalicus reses* (not incl. *nesodryas*)	T			X
Plants					
Crenulate lead plant	*Amorpha crenulata*	E			X
Deltoid spurge	*Chamaesyce deltoidea* spp. *deltoidea*	E			X
Garber's spurge	*Chamaesyce garberi*	T			X
Johnson's seagrass*	*Halophila johnsonii*	E, CH			X
Okeechobee gourd	*Cucurbita okeechobeensis* ssp. *okeechobeensis*	E			X
Small's milkpea	*Galactia smallii*	E			X
Tiny polygala	*Polygala smallii*	E			X
Big pine partridge pea	*Chamaecrista lineata* var. *keyensis*	Pr E			X
Blodgett's silverbush	*Argythamnia blodgettii*	Pr T			X
Cape Sable thoroughwort	*Chromolaena frustrata*	E, CH			X
Carter's small-flowered flax	*Linum carteri* var. *carteri*	E, Pr CH			X
Everglades bully	*Sideroxylon reclinatum* spp. *austrofloridense*	C			X
Florida brickell-bush	*Brickellia mosieri*	E, Pr CH			X
Florida bristle fern	*Trichomanes punctatum* spp. *floridanum*	Pr E			X
Florida pineland crabgrass	*Digitaria pauciflora*	C			X
Florida prairie-clover	*Dalea carthagenensis* var. *floridana*	C			X

Florida semaphore cactus	*Consolea corallicola*	E			X
Pineland sandmat	*Chamaesyce deltoidea* ssp. *pinetorum*	C			X
Sand flax	*Linum arenicola*	Pr E			X

E=Endangered; T=Threatened; SA=Similarity of Appearance; CH=Critical Habitat; C=Candidate Species, Pr E = Proposed Endangered, Pr CH = Proposed Critical Habitat

* Marine species under the purview of the National Marine Fisheries Service (NMFS). NMFS concurred, in April 2016, that no marine or estuarine habitats would be affected by the project.

DETAILED SPECIES DETERMINATIONS EXPECTED WITHIN THE PROJECT AREA:

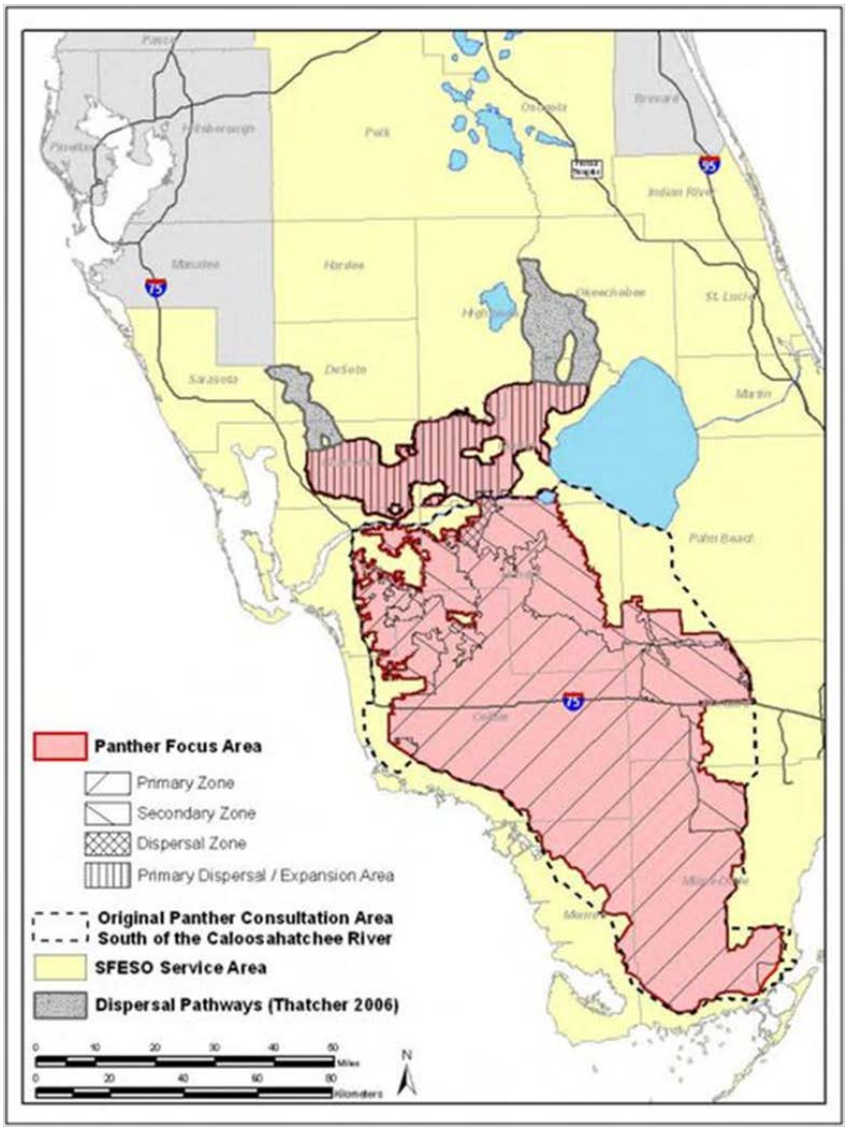
6.1 Florida Panther, *Puma concolor coryi.* (E) "May Affect, Not Likely to Adversely Affect Determination"

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. Present population estimations range from 80 to 100 individuals. Preferred habitat consists of cypress swamps, pine and hardwood hammock forests. The main diet of the Florida panther consists of white-tailed deer, sometimes wild hog, rabbit, raccoon, armadillo, and birds. Florida panthers are solitary, territorial, and often travel at night. Males have a home range of up to 400 square miles and females about 50 to 100 square miles. Female panthers reach sexual maturity at about three years of age. Mating season is December through February. Gestation lasts about 90 days and females bear two to six kittens. Juvenile panthers stay with their mother for about two years. Survival threats include habitat loss, collision with vehicles, parasites, feline distemper, feline calcivirus and other infectious diseases.

Florida panthers presently inhabit lands in ENP adjacent to the Southern Glades, and radio tracking studies have shown that they venture into the Southern Glades on occasion during post-breeding dispersion.

The Corps determined that proposed project may affect, but is not likely to adversely affect the Florida panther in or near the S-332D Detention Area or L-31 W Canal. Figure 3 shows Florida Panther core habitat and dispersal habitat. The project is not located within the core habitat and does not provide ideal hunting habitat. Panthers, especially dispersing male panthers, may wander into the edges of the Detention Areas, and have been observed in adjacent areas of ENP, but the quality of habitat in the project area (cover and prey species abundance) is poor compared to that available inside ENP. Panthers may avoid the noise and other disturbance in the area caused by heavy construction machinery but this effect due to construction will be temporary in nature.

Figure 2. Florida Panther Consultation Area



6.2 Florida Manatee, *Trichechus manatus latirostris,* (E) "No Effect Determination"

Manatees are large, plant-eating aquatic mammals that transit many South Florida canals, and are also found in Florida Bay and the coastal segment of C-111. Manatees are blocked from the sections of the L-31W canal and C-111 Canal in the project area by pump stations, gates and spillways. No effect of the proposed actions for this project is expected on this species Although recent aerial surveys show that certain parts of the C-111 Project canals may be accessible to

manatees, designated critical habitat is found only along the most coastal segment of C-111, which is not within the proposed project footprint. The Corps has determined that proposed project would not affect manatees or designated critical habitat. Figure 4 illustrates Florida manatee critical habitat.

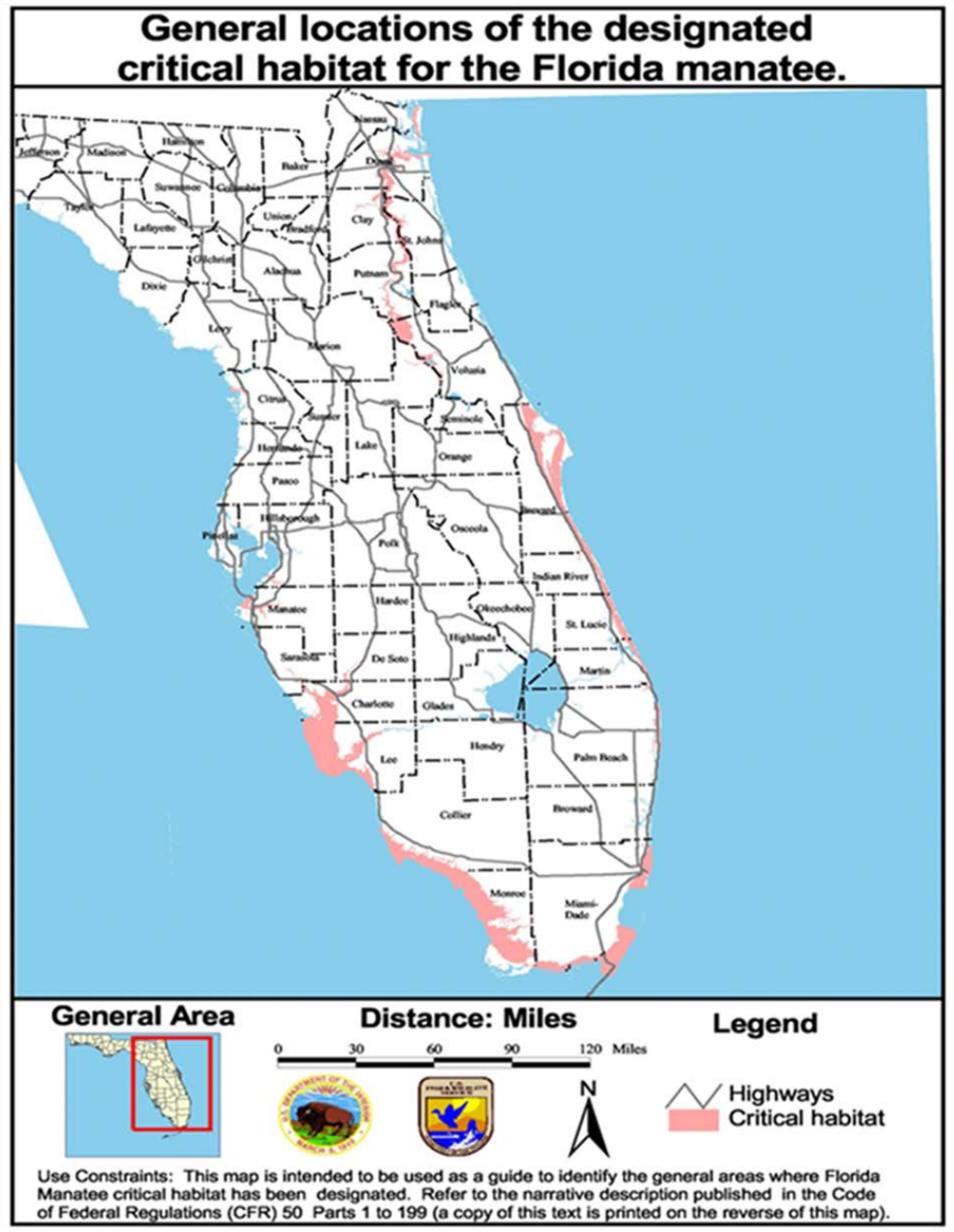


Figure 3. Florida Manatee Critical Habitat

6.3 Florida Bonneted Bat, *Eumops floridanus*, (E) "May Affect, Not Likely to Adversely Affect Determination"

Florida's largest and only endemic bat species, the Florida bonneted bat, appears to inhabit hollows in trees, Spanish tile roofs and bat houses in inhabited areas and limestone cracks and outcroppings. Most known colonies of this insectivorous species were small, and were found in man-made structures (bat houses). The S-332D Detention Cell along the north-south-trending section (reach 4) contains a large tree island that might provide habitat. Another relict tree island is bisected by the Canal south of the Park road. These areas would not be plugged or disturbed. Although its habits are not very well known, the Florida bonneted bat has not been observed in this area, but its calls have been heard inside ENP. ENP staff have to date been unable to find bat roosts. Therefore, although the project falls within a consultation area for the bonneted bat, the lack of trees, residences or outcrops in the Canal segments proposed for plugging has led the Corps to determine that the proposed project "May Affect, but is Unlikely to Adversely Affect" the bonneted bat. Figure 5 shows consultation areas and focus areas for this species. Construction activities will involve heavy earth-moving machinery, whose operations might generate enough noise to temporarily disturb roosting bats, but this effect would be of short duration, and would be unlikely to cause permanent adverse impacts on bat colonies.

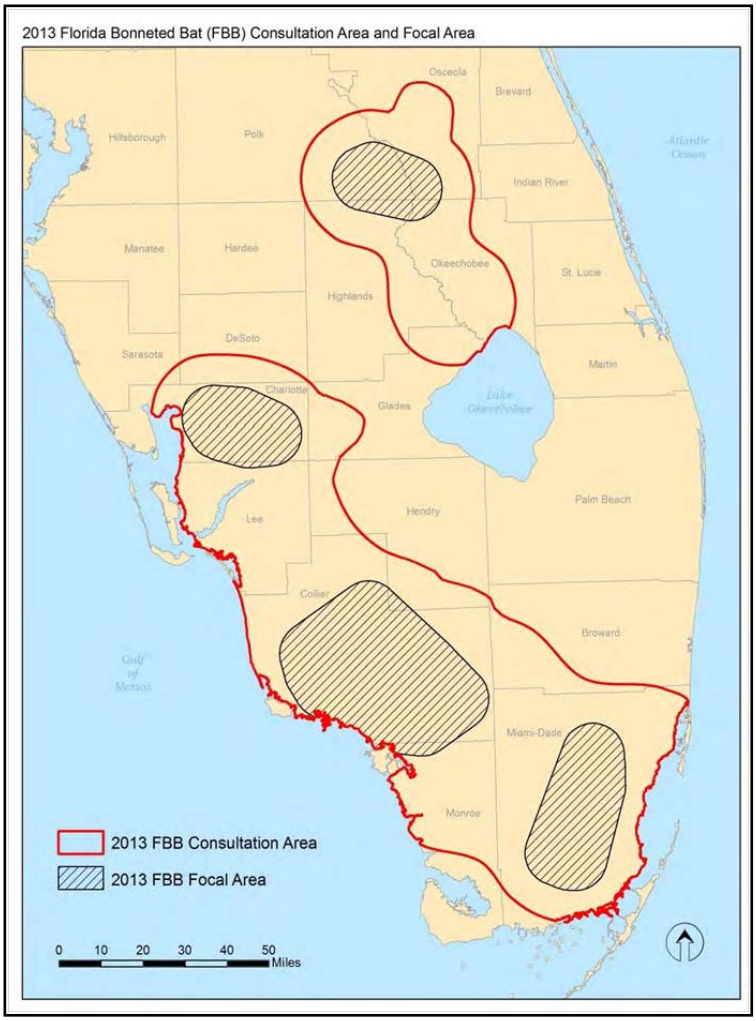


Figure 4. Florida Bonneted Bat Consultation Area

6.4 Cape Sable Seaside Sparrow (CSSS), *Ammodramus maritimus mirabilis* (E) "May Affect Not Likely to Adversely Affect Determination"

The CSSS is one of the most severely endangered bird species in Florida. The CSSS population inhabits short-hydroperiod (*Muhlenbergia* grass) prairies, primarily inside ENP. A small insectivorous bird, it forages on and near the ground and nests in grass only a few inches above the ground surface, initiating reproduction during the dry season. Nests can be flooded and abandoned due to untimely rains during the dry season (more than 20 cm or 6 in. of surface water over more than a short time). In 2007, FWS designated Critical Habitat Units for the CSSS (Figure 6), consisting of only five population clusters, one of which occurs in Taylor Slough in close proximity to the C-111 SD S-332 D Detention Area (Unit 2, Subpopulation C,). Other habitat centers include large Habitat Unit 1 (Subpopulation B), centered west of Taylor Slough along the main ENP road; Unit 3 (Subpopulation D) located to the south of the project, and Unit 4 (Subpopulation E), located farther west and north of Unit 1. The largest habitat unit of the CSSS is located in Subpopulation A, which is northwest of the project footprint, and west of Shark River Slough. Critical Habitat was not designated for subpopulation A. The units close to the project do not support the largest CSSS populations; it is believed that they are too dry to provide optimal nesting habitat quality and durations during most nesting seasons, due in part to the drying effect of groundwater seepage out of ENP to the east.

The combination of proposed project modifications to the C-111SD Project beginning in 1999 and continuing through IOP, ERTP, Increment I of the MWD Field Test and the construction proposed in this assessment, should further decrease or limit seepage out of the eastern ENP boundary, facilitating the rehydration of Taylor Slough and the recovery of Critical Habitat Units 2 and 5. Other, more remote nesting locations would not be expected to be affected. The Corps has determined the proposed project "may affect, but is not likely to adversely affect" the CSSS or its designated critical habitat.

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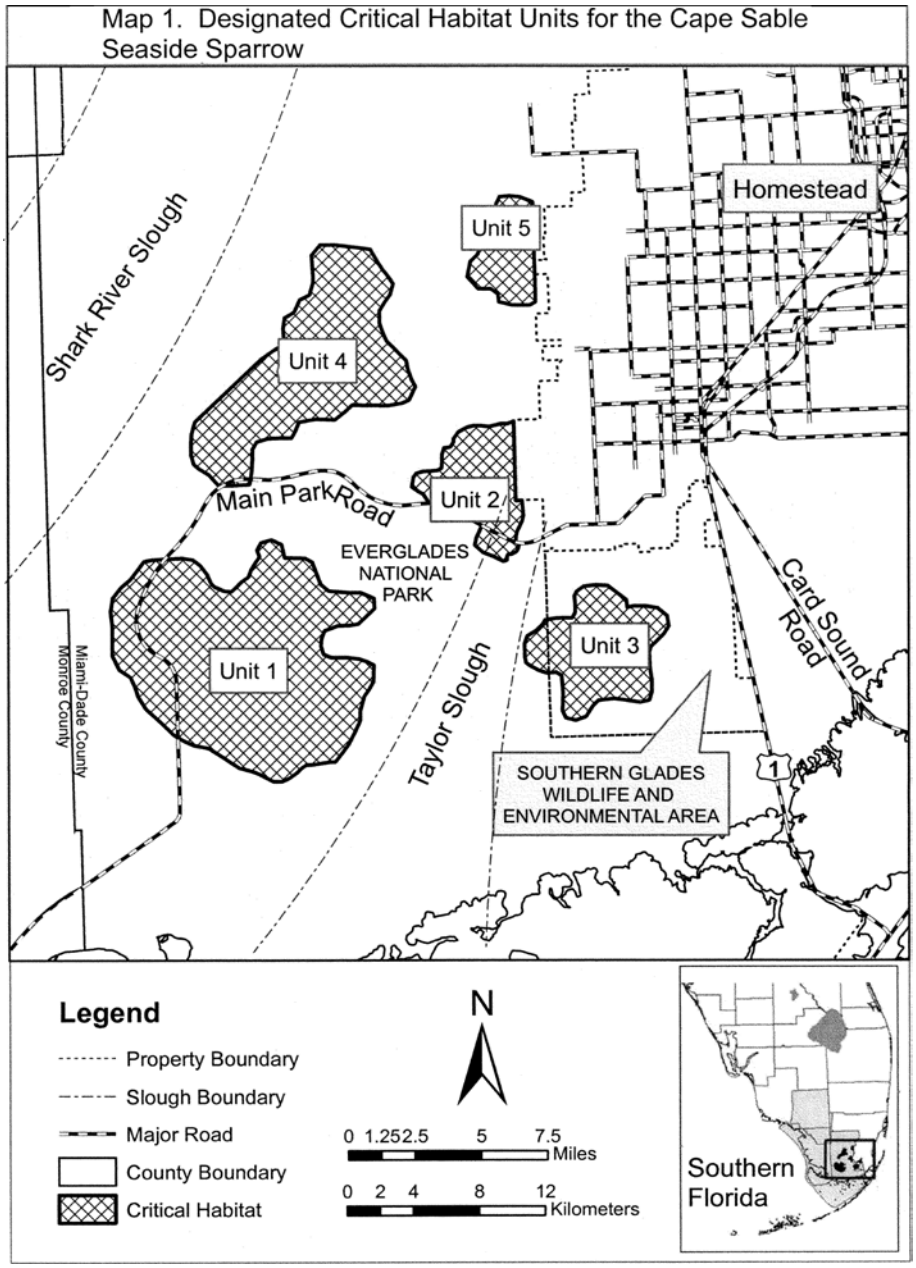

Figure 5. Designated CSSS Critical Habitat (From Federal Register Revised CSSS Critical Habitat Designation, p. 62766. Federal Register / Vol. 72, No. 214 / November 6, 2007

6.5 Everglade Snail Kite, *Rostrhamnus sociabilis plumbeus, (E)* "No Effect Determination"

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

Everglade snail kite habitat consists of freshwater marshes and the shallow vegetated edges of lakes where the apple snail (*Pomacea paludosa*), the Everglade snail kite's main food source, can be found. Snail kite populations in Florida are highly nomadic and mobile; tracking favorable hydrologic conditions and food supplies, and thus avoiding local droughts. Snail kites move widely throughout the primary wetlands of the central and southern portions of Florida. Snail kite nesting locations between 2001 and 2012 within south Florida are depicted in Figure 7**.**

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

Critical habitat for the Everglade snail kite was designated September 22, 1977 (42 FR 47840 47845) and includes areas of land, water, and airspace within portions of the St. Johns Reservoir, Indian River County; Cloud Lake Reservoir, St. Lucie, County; Strazzulla Reservoir, St. Lucie County; western portions of Lake Okeechobee, Glades and Hendry counties; Loxahatchee National Wildlife Refuge (WCA 1), Palm Beach County; WCA 2A, Palm Beach and Broward counties; WCA 2B, Broward County; WCA 3A, Broward and Miami-Dade counties; and ENP to the Miami-Dade/Monroe County line.

Snail kite nesting habitat is not found within or close to the proposed project area, nor is construction likely to cause an effect on feeding, nesting or fledging of nestlings. The Canal itself is too deep to support vegetation for nesting kites. The Corps has determined the proposed project would have "no effect" on the Everglades snail kite nor its designated critical habitat.

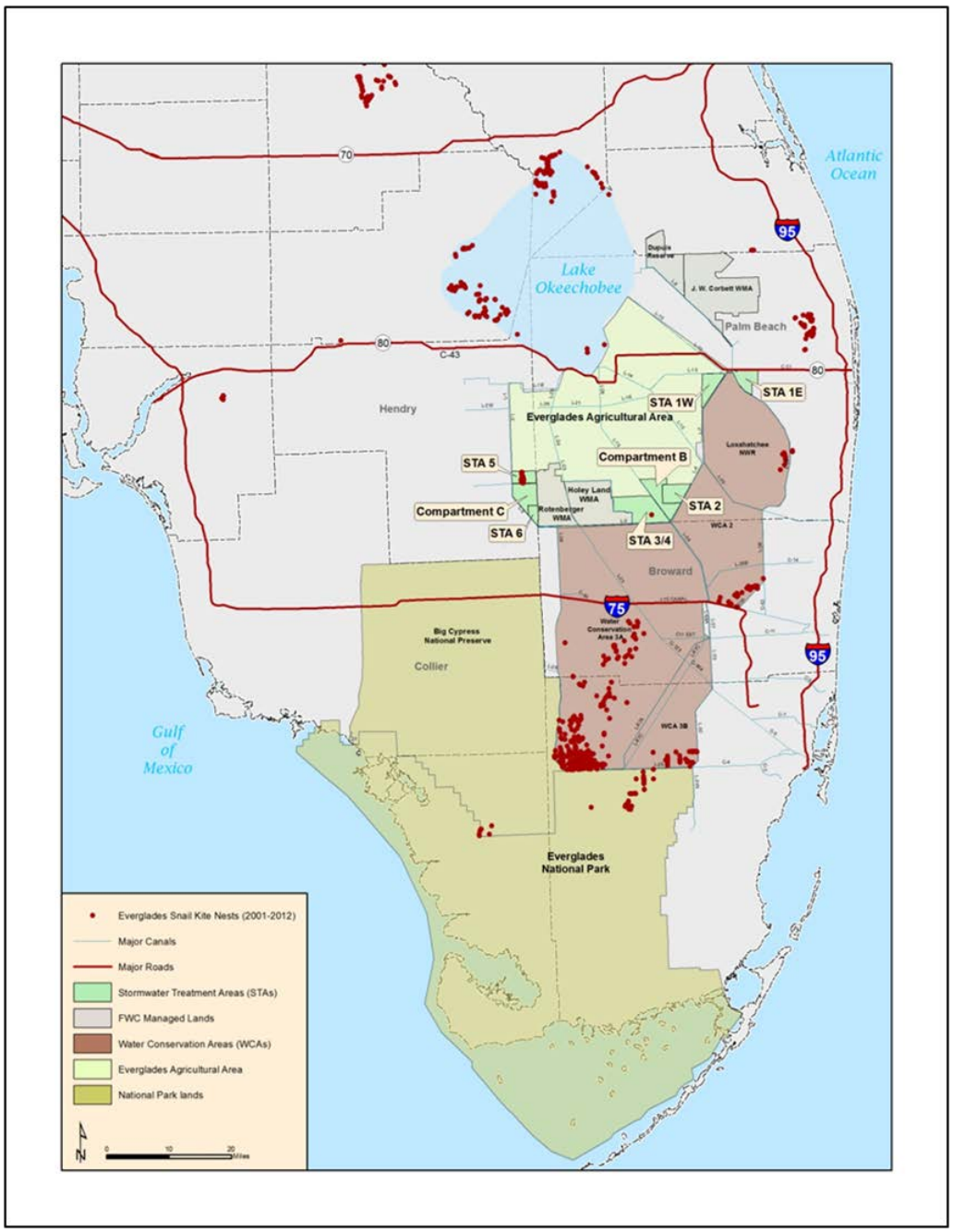

Figure 6. Everglade Snail Kite Nest Locations (2001-2012).

6.6 Piping Plover, *Charadrius melodus,* (T) and "No Effect Determination"

The piping plover does not breed in Florida; breeding populations occur near the Great Lakes, the Northern Great Plains, and the Atlantic Coast. Piping plovers regularly winter in the south Florida counties of Broward, Collier, Indian River, Lee, Martin, Miami-Dade, Monroe, Palm Beach, St. Lucie, and Sarasota (Haig 1992). Piping plovers nest and feed along coastal sand and gravel beaches throughout North America. Due to lack of preferred wintering habitat within the project area, the Corps has determined that the proposed action would have "no effect" on the piping plover.

6.7 Red-cockaded Woodpecker, *Picoides borealis,* (E) and "No Effect Determination"

The red-cockaded woodpecker is a small woodpecker with a conspicuous white cheek patch, black and white cross-barred back, black cap and nape, white breast and flanks with black spots. The male has a small red spot on each side of the head. They are a social species and live in groups with a breeding pair and up to four helpers. Approximately 200 acres of mature pine forests are necessary to support each group's nesting and foraging habitat needs. Juvenile females will leave the group prior to the breeding season and establish a breeding pair within a solitary male group. There is no breeding or foraging habitat (no pine rockland forest or other pine forest) within the action area of the project; therefore, the Corps has determined that the proposed project would have "no effect" on the red-cockaded woodpecker.

6.8 Roseate tern, *Sterna dougallii dougallii,* (T) and "No Effect Determination"

Roseate tern (*Sterna dougallii)* occurs in South Florida, where it is listed as threatened. Roseate tern nesting habitat is on protected sandy beaches, mostly in the Dry Tortugas of the Florida Keys, remote from the construction area. The Corps has determined that the proposed project would have "no effect" on the roseate tern due to lack of appropriate foraging or nesting habitat in the project area.

6.9 Wood stork, *Mycteria americana,* (T) and "No Effect Determination"

The wood stork is a large, white, long-legged wading bird with a black, naked head that relies upon shallow, freshwater wetlands for foraging. A tactile feeder, the wood stork is found from northern Argentina, eastern Peru and western Ecuador north to Central America, Mexico, Cuba, Hispaniola, and the southeastern United States (AOU 1983). Only the population segment that breeds in the southeastern United States is listed and on July 20, 2014 was downgraded from endangered to threatened status under the ESA of 1973, as amended. 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, Cone and Hall 1970, Oberholser 1938). 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.

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, Coulter 1987, Gawlik and Crozier 2004, Herring and Gawlik 2007). Calm water, about 5 to 25 cm 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). Nesting sites are generally in tall trees. During nesting, foraging areas must also be sufficiently close to the colony to allow wood storks to efficiently deliver prey to nestlings. Outside of the nesting season, wood storks may be observed over much of Florida,

including roadside ditches, stream banks and irrigation canals. Nesting colonies exist along the eastern segment of Tamiami Trail and well south of the action area inside ENP (Figure 8).

Proposed plugging actions will not be near any known wood stork nesting areas. Foraging wood storks often are observed alongside highways and agricultural machinery in partially flooded fields; therefore even during earth-moving activities they are unlikely to show disturbance due to construction. The Corps has determined that the proposed project would cause "no effect" on the wood stork.

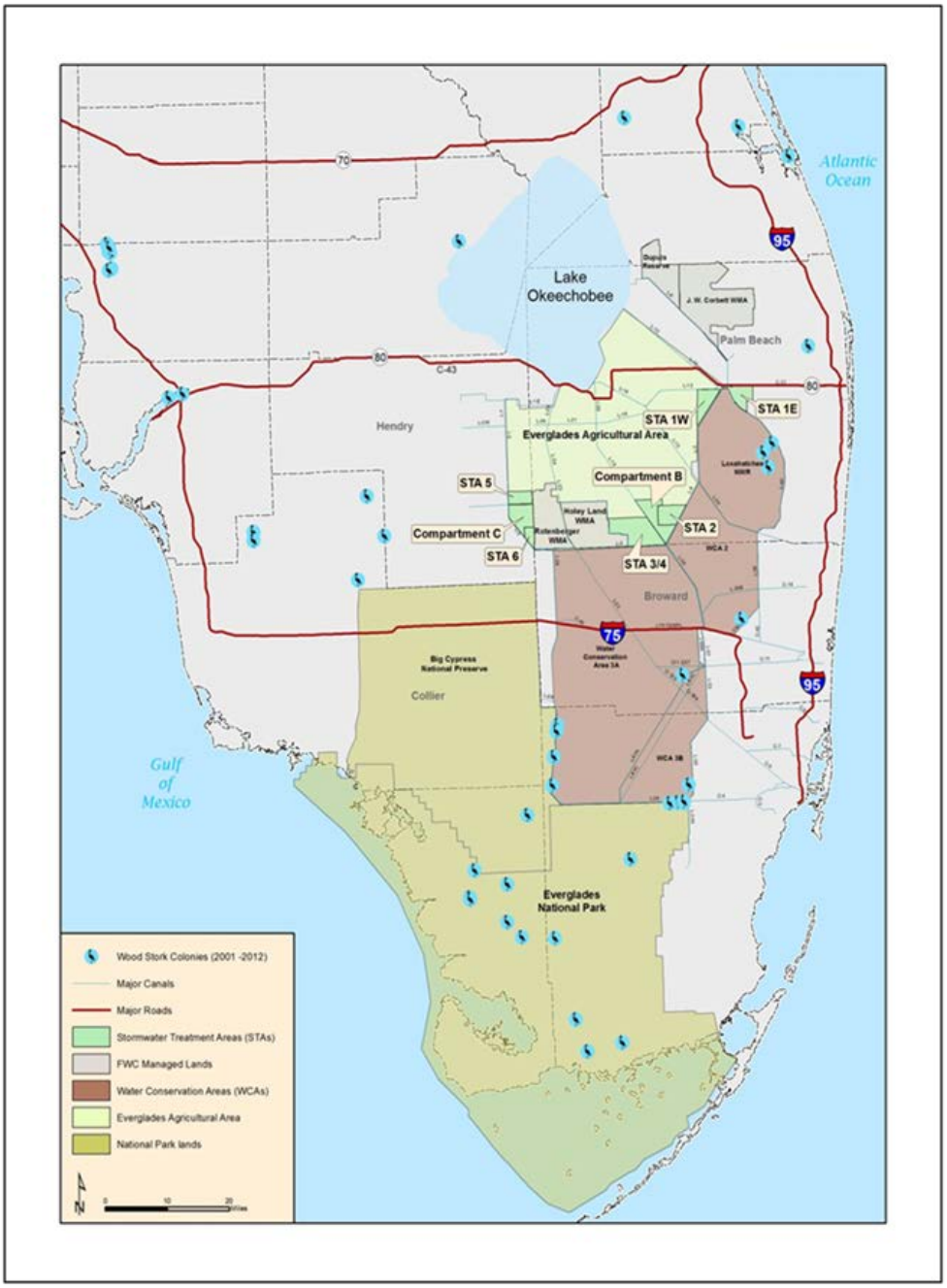

Figure 7. Wood Stork Nesting Locations (2001-2012)

6.10 American alligator, *Alligator mississippiensis*. (T, SA) "No Effect Determination"

The American alligator is listed as threatened by the USFWS due to similarity of appearance to the American crocodile, a threatened species. A keystone species within the Everglades ecosystem, the American alligator is dependent on spatial and temporal patterns of water fluctuations that affect courtship and mating, nesting, and habitat use (Brandt and Mazzotti 2000). Historically, American alligators were most abundant in the peripheral Everglades marshes and freshwater mangrove habitats, but are now most abundant in canals and the deeper slough habitats of the central Everglades. Water management practices, including drainage of peripheral wetlands and increasing salinity in mangrove wetlands as a result of decreased freshwater flows has limited occurrence of American alligators in these habitats (Craighead 1968, Mazzotti and Brandt 1994). Increased water deliveries to ENP may beneficially affect American alligator habitat. Elimination or modification of American alligator habitat is not expected under proposed construction. The Corps has determined that the proposed project would have "no effect" on the American alligator.

6.11 American crocodile, *Crocodylus acutus*, (T, CH) "No Effect Determination"

American crocodiles inhabit coastal fringes from Miami to the bottom of the peninsula and north to the Naples area. There are no coastal fringes within the project area of the, and no known reports of crocodiles within the project area. Crocodile critical habitat is shown in Figure 9. The Corps has determined that the proposed project would have "no effect" on the American crocodile nor its designated critical habitat.

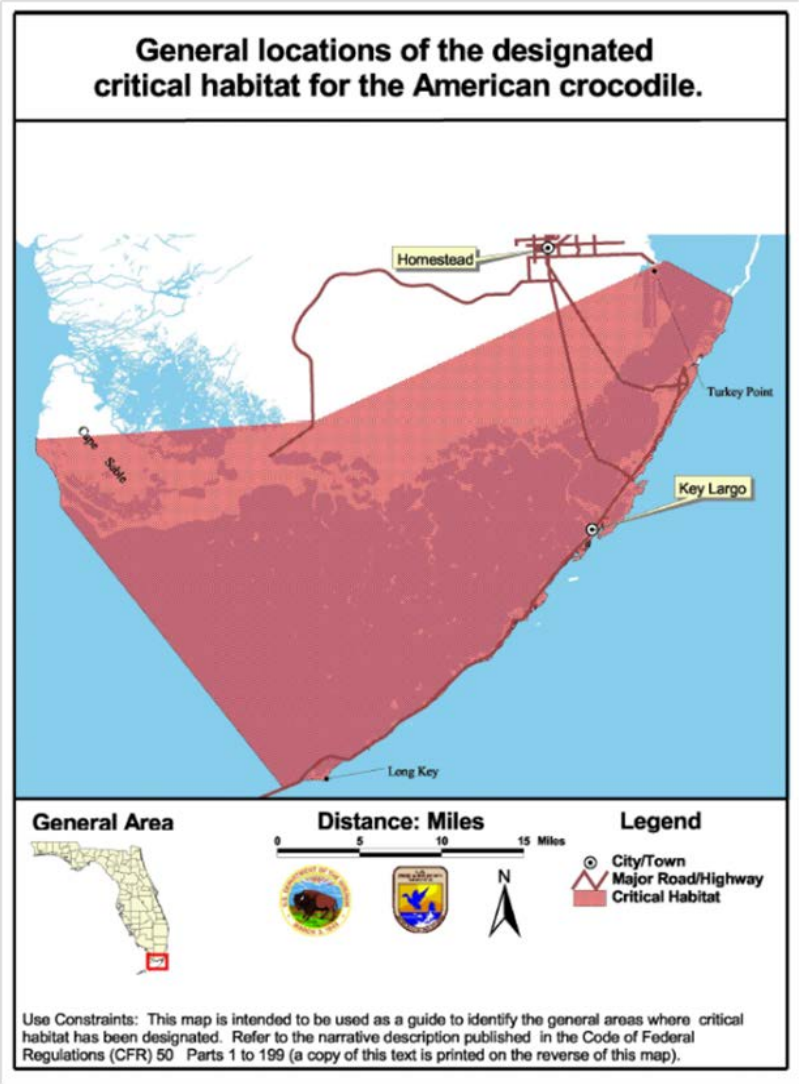

Figure 8. American Crocodile Critical Habitat

6.12 Eastern indigo snake, *Drymarchon corais couperi,* (T) "May Affect, Not Likely to Adversely Affect Determination"

Eastern indigo snakes were listed as threatened in 1978 due primarily to habitat loss due to development. Further, as habitats become fragmented by roads, Eastern indigo snakes become increasingly vulnerable to highway mortality as they travel through their large territories (Schaefer and Junkin 1990). Declines in Eastern indigo snake populations were also due to over-collection by the pet trade and mortality caused by rattlesnake collectors who gas gopher tortoise burrows to collect snakes (USFWS 2013).

The Eastern indigo snake is the largest native non-venomous snake in North America, reaching lengths of up to 8.5 feet (Moler 1992). It is an isolated subspecies occurring in southeastern Georgia and throughout peninsular Florida. The Eastern indigo snake prefers drier habitats, but may be found in a variety of habitats including pine flatwoods, scrubby flatwoods, floodplain

edges, sand ridges, dry glades, tropical hammocks, edges of freshwater marshes, muckland fields, coastal dunes, cabbage palm hammocks, and xeric sandhill communities (Schaefer and Junkin 1990, USFWS 1999). Eastern indigo snakes also use agricultural lands and various types of wetlands.

Although it is not known if there are eastern indigo snakes within the existing project area, this species has been known to search out and hide in earth-moving machinery. During construction of the project features, special indigo snake precautions will be included in project specifications to avoid adverse effects. Based on special indigo snake specifications, the Corps has determined that the proposed project "may affect, but is not likely to adversely affect" the Eastern indigo snake.

6.13 Bartram's Hairstreak Butterfly, *Strymon acis bartrami,* (E) "No Effect Determination"

Bartram's hairstreak butterfly is a species of pinelands. Larvae feed exclusively on the pineland croton. The species is known only from pine scrub on Big Pine Key and in ENP. The species population appears to be in decline and may be subject to predation by invasive ant species. No suitable habitat occurs in the project construction area; therefore, the Corps has determined that the proposed project would have "no effect" on the Bartram's hairstreak butterfly.

6.14 Miami Blue Butterfly, *Cyclargus thomasi bethunebakeri,* (E) "No Effect Determination"

The Miami blue butterfly occurs at the edges of tropical hardwood hammocks, beachside scrub and in rockland pine forests, feeding on nickerbeans, blackbeard and balloon vine leaves as a larva. Neither the plant species nor the cover type are present in the action area; therefore, the Corps has determined that the proposed project would have "no effect" on the Miami blue butterfly.

6.15 Florida Leafwing Butterfly, (E) *Anea troglodyta floridalis,* "No Effect Determination"

The Florida leafwing is a medium-sized butterfly. The upper-wing (or open wing) surface color is red to red-brown, the underside (closed wings) is gray to tan, with a tapered outline, cryptically looking like a dead leaf when the butterfly is at rest. The Florida leafwing exhibits sexual dimorphism, with females being slightly larger and with darker coloring along the wing margins than the males. The Florida leafwing occurs only within pine rocklands that retain its host plant, pineland croton. Pineland croton, a subtropical species of Antillean origin, is the only known host plant for the leafwing. There are no pine rocklands in the project area. Due to the lack of host plants or habitat, the Corps has determined that the proposed project would have "no effect" on the Florida leafwing butterfly.

6.16 Schaus swallowtail butterfly, *Heraclides aristodemus ponceanus,* (E) "No Effect Determination"

The Schaus swallowtail butterfly is a large dark brown and yellow butterfly originally listed as an endangered species because of population declines caused by the destruction of its tropical hardwood hammock habitat, mosquito control practices, and over-harvesting by collectors. Schaus swallowtail butterfly distribution is limited to tropical hardwood hammocks and is concentrated in the insular portions of Miami-Dade and Monroe counties, from Elliott Key in Biscayne National Park and associated smaller Keys to central Key Largo (USFWS 1999). It is estimated that remaining suitable habitat for this species is 43% of the historical suitable habitat in Biscayne National Park and 17 percent for north Key Largo. The decline has been attributed

primarily to habitat destruction (USFWS 1999). Due to the lack of subtropical hardwood hammock habitat in the action area, the Corps has determined that the project would have "no effect" on the Schaus swallowtail butterfly.

6.17 Stock Island Tree Snail, *Orthalicus reses (not incl. nesodryas),* (T) "No Effect Determination"

The arboreal Stock Island tree snail inhabits hardwood hammocks consisting of tropical trees and shrubs such as gumbo limbo, mahogany, ironwood, poisonwood, marlberry and wild coffee, among others. The historic distribution of the Stock Island tree snail was thought to be limited to hardwood hammocks on Stock Island and Key West and possibly other lower Keys hammocks. Recently, the range of this species has been artificially extended through the actions of collectors who have introduced it to Key Largo and the southernmost reaches of the mainland. At present, this snail occupies six sites outside of its historic range including ENP and Big Cypress National Preserve. Due to the lack of preferred subtropical hardwood hammock habitat in the action area, the Corps has determined that the proposed project would have "no effect" on the Stock Island tree snail.

6.18 Plants - "No Effect Determination"

There are 19 species of plants on the list of threatened and endangered species in Miami-Dade county. Due to to absence of suitable habitat for the species on the list in the project area, the Corps has determined that the proposed plug construction will not affect any of them. This determination was made on the advice of FWS after consultation on the last C-111 South Dade contract was completed on March 30, 2016.

6.19 Species under jurisdiction of the National Marine Fisheries Service on Table 1. "No Effect Determination"

In separate coordination with the National Marine Fisheries Service, the Corps considered the following species: Green sea turtle, *Chelonia mydas* (E), Hawksbill sea turtle, *Eretmochelys imbricata* (E), Kemp's Ridley sea turtle, *Lepidochelys kempii* (E), Leatherback sea turtle, *Dermochelys coriacea* (E), Loggerhead sea turtle, *Caretta caretta* (T), Smalltooth sawfish, *Pristis pectinata)* (E, CH), Elkhorn coral, *Acropora palmata* (T, CH), Staghorn coral, *Acropora cervicornis* (T, CH), and Johnson's seagrass, *Halophila johnsonii.* Due to lack of marine or estuarine habitat on the project the Corps determined that the proposed project would have "no effect" on these species. NMFS concurred with this determination in April, 2016.

7. EFFORTS TO ELIMINATE POTENTIAL IMPACTS ON LISTED SPECIES.

The Corps commits to avoiding, minimizing or mitigating for adverse effects during construction. All practicable means to avoid or minimize environmental effects were incorporated into the proposed action. Special conditions to accompany the proposed action include: requiring a biologist-observer at the construction site during the flow-way berm construction to orient contractor personnel on appearance of indigo snakes and precautionary measures to avoid take, especially around earth-moving machinery. Additionally, the Corps and South Florida Water Management District (SFWMD) will continue existing hydrologic and species monitoring plans to ensure that Incidental Take as defined within the USFWS 2009 C-111 Western Spreader Canal Project BO and the 2010 or 2016 ERTP BO are not exceeded. Both SFWMD and the Corps are

required to provide annual assessments of ERTP operations. SFWMD summarizes annual results in the South Florida Annual Report. The Corps provides a separate annual assessment of ERTP operations, including a summary of Periodic Scientist Calls, analysis of incidental take, analysis of ERTP performance measures, ecological targets and species monitoring. The Corps will maintain ongoing communications with the FWS throughout the duration of proposed construction.

7 REFERENCES

USACE. Environmental Assessment: C-111 South Dade Modifications to North and South Detention Areas and other Features. January 2016.

USACE. Complete Initiation Package for G-3273/S-356 Field Test and S-357N Operational Strategy. 2015. Appendix A of Environmental Assessment for G-3273 Field Test, 2015.

USACE. Environmental Assessment; Design Refinement for the 8.5 Square Mile Area, Miami-Dade County, Jacksonville, Florida, August 2012a.

USACE. Environmental Assessment for Expansion of Canal 111 (C-111) Detention Area and Associated Features South Miami-Dade County, Florida, Jacksonville, Florida, May 2012b.

USACE. Central and South Florida Project: Water Control Plan for Water Conservation Areas, Everglades National Park, and ENP-South Miami-Dade Conveyance System. Jacksonville, Florida, October 2012c.

USACE. Supplemental Environmental Impact Statement, Jacksonville USACE. Interim Operational Plan for the Protection of the Cape Sable Seaside Sparrow Final, Florida, December 2006 (ROD May, 2007).

USACE. Central and Southern Florida Project, Modified Water Deliveries to Everglades National Park, Florida: 8.5 Square Mile Area. General Re-evaluation Report and Final Supplemental Environmental Impact Statement, 2000.

USACE. Canal-111 (C-111, South Dade County, Florida, Final Integrated General Reevaluation Report and Environmental Impact Statement, 1994.

USFWS. Endangered and Threatened Species webpages and tools: http://www.fws.gov./endangered. Individual species accounts.

USFWS. Designated CSSS Critical Habitat. Revised CSSS Critical Habitat Designation, p. 62766. Federal Register / Vol. 72, No. 214 / Tuesday, November 6, 2007.

USFWS. 2016. Letter of concurrence, USACE EA and Biological Assessment, "C-111 South Dade, Modifications to North and South Detention Areas and related features." March 30, 2016.