APPENDIX C:
G-3273 CONSTRAINT RELAXATION/S-356 FIELD TEST AND S-357N OPERATIONAL STRATEGY ENVIRONMENTAL ASSESSMENT

PROPOSED G-3273 CONSTRAINT RELAXATION/S-356 FIELD TEST AND S-357N OPERATIONAL STRATEGY

COMPLETE INITIATION PACKAGE

U.S. FISH AND WILDLIFE SERVICE

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1.0 PROJECT AUTHORITY

A minimum schedule of water deliveries from the Central and Southern Florida (C&SF) Project to Everglades National Park (ENP) was authorized by Congress in 1970 in Public Law (PL) 91-282. Section 1302 of the Supplemental Appropriations Act of 1984 (PL 98-181), passed in December 1983, authorized the U.S. Army Corps of Engineers (Corps), with the concurrence of the National Park Service (NPS) and South Florida Water Management District (SFWMD), to deviate from the minimum delivery schedule for two years in order to conduct an Experimental Program of water deliveries to improve conditions within ENP. Section 107 of PL 102-104 amended PL 98-181 to allow continuation of the Experimental Program until modifications to the C&SF Project, authorized by Section 104 of the ENP Protection and Expansion Act of 1989 (PL 101-229) were completed and implemented. The purpose of PL 101-229 was "To modify the boundaries of the Everglades National Park and to provide for the protection of lands, waters, and natural resources within the park, and for other purposes". This act also authorized the Secretary of the Army, upon completion of a General Design Memorandum (GDM), to modify the C&SF Project to improve water deliveries to the park and to the extent practicable permit steps to restore the natural hydrology within the park. The Modified Water Deliveries (MWD to ENP GDM and Final Environmental Impact Statement (EIS) were published in July 1992 (USACE 1992).

When the Corps completed the MWD GDM and Final EIS in 1992, the operational plan identified in the GDM was not considered final. The recommended plan was selected on the basis of expected environmental benefits derived from a modified water delivery schedule. The GDM called for hydrologic modeling, coordination of modeling results, and environmental evaluations to develop an acceptable water control plan. The GDM also recognized that review and adjustment of project operations would continue as experience and additional assessment of data revealed potential for improvement.

The PL for the MWD Project (PL 101-229) was amended as PL 108-7 (Appropriations Act, 2003). This authorization bill identified Alternative 6D (the Selected Alternative in the July 2000 General Reevaluation Report [GRR] and Final Supplemental EIS for 8.5 Square Mile Area [8.5 SMA]) as the plan to be built, authorized relocation of residents, and other provisions (USACE 2000).

2.0 LOCATION

The MWD Project is a specific feature of the C&SF Project that is located in south Florida and includes portions of Miami-Dade County as well as portions of ENP and adjacent areas (**FIGURE 1**). The 1992 MWD GDM and Final EIS defines the project boundary as Shark River Slough (SRS) and that portion of the C&SF Project north of structure 331 (S-331) to include Water Conservation Area 3 (WCA 3).

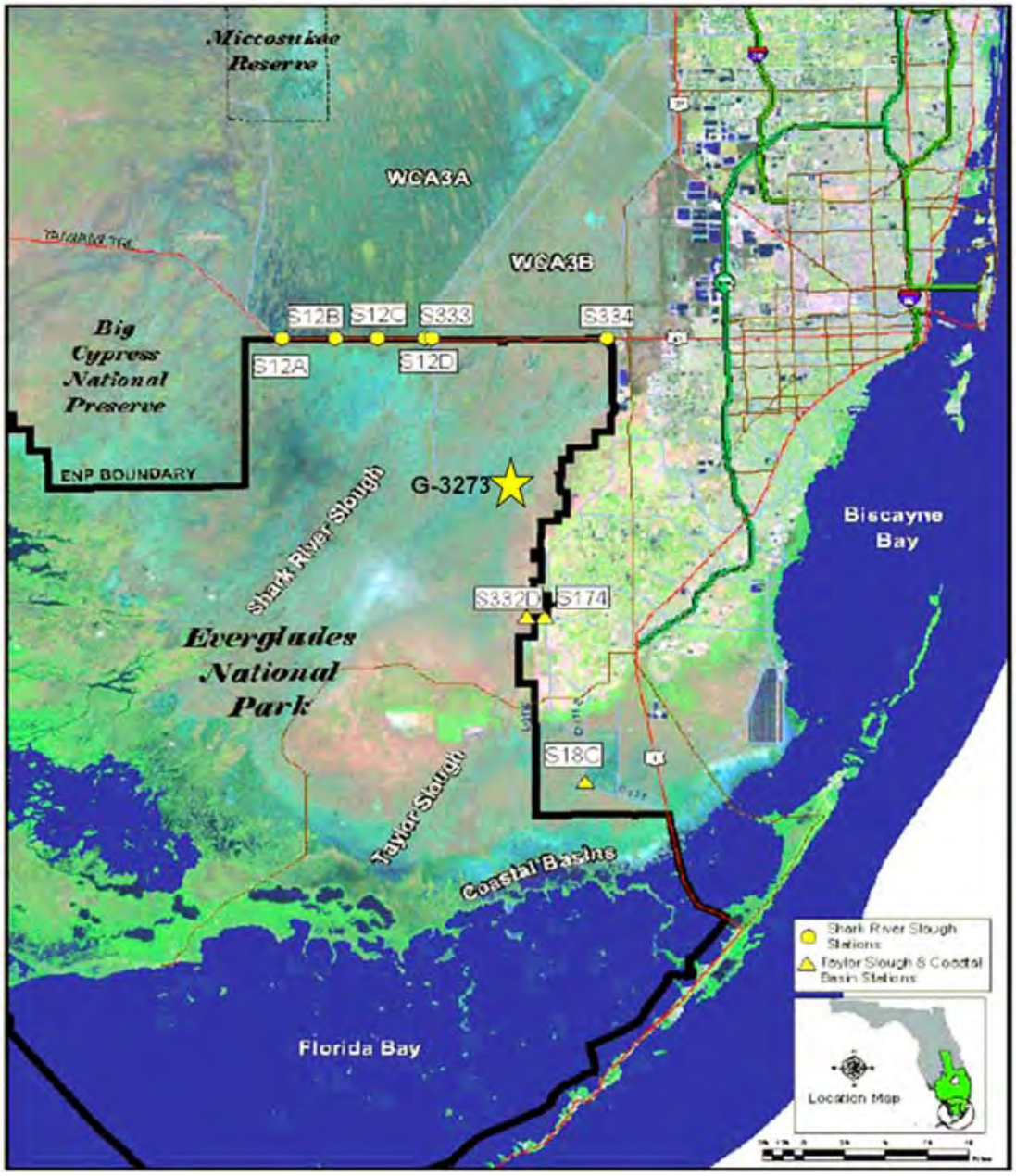

FIGURE 1. PROJECT LOCATION

3.0 PROJECT BACKGROUND

The MWD Project provides a system of water deliveries to ENP across the full width of the historic SRS flow-way and consists of four main components: (1) conveyance and seepage control features to facilitate flow through the system from WCA 3A to WCA 3B and to limit seepage eastward from WCA 3B and ENP; (2) modifications to Tamiami Trail to facilitate flow under the road to SRS; (3) flood mitigation for the developed East Everglades area (also referred to as the 8.5 SMA); and (4) project implementation support, which includes monitoring and operational changes. The MWD GDM and Final EIS (USACE 1992) includes a discussion of the location, capacity, and environmental impacts for the proposed structural modifications,

which included structures S-345A, B and C; S-349A, B and C; S-355A and B; S-334 modification, removal of the L-67 extension levee and borrow canal filling; and a levee and canal system for flood mitigation in 8.5 SMA. The levee and canal system included two pumping stations, S-356 and S-357 (**FIGURE 2**).

The 8.5 SMA features were constructed to provide flood mitigation to the Las Palmas Community in order to prevent impacts from higher stages within Northeast Shark River Slough (NESRS) resulting from the implementation of MWD to the private land owners located east of ENP. A GRR and Final Supplemental EIS for 8.5 SMA were completed in July 2000 (USACE 2000). The GRR recommended Alternative 6D, consisting of a perimeter levee (Levee 357W [L-357W]), internal levees, a seepage collection canal, a new pump station (S-357), and a detention cell that would discharge into the proposed C-111 South Dade North Detention Area (NDA), as part of the C-111 South Dade Project (**FIGURE 2**). A design refinement for 8.5 SMA and environmental assessment (EA) were completed in August of 2012 (USACE 2012a). An operational test conducted in 2009 indicated that the S-357 pump station may have greater efficiency with removing water from the 8.5 SMA and adjacent lands than envisioned, causing an increase in seepage in the southwest corner. To allow for utilization of the S-357 pump station at maximum capacity, an additional east-west seepage collection canal (C-358) was identified to prevent groundwater stage increases in the southwest corner (east of L-357W). In addition, the 8.5 SMA detention area would need to be connected to the proposed C-111 South Dade NDA. A structure (S-357N), not yet constructed, would connect this seepage collection canal to the existing infrastructure.

Construction of the 8.5 SMA features, as described in the July 2000 GRR and Final Supplemental EIS was completed prior to completion of the proposed full build-out of the C-111 South Dade NDA. The C-111 South Dade Project was constructed as part of the ENP–South Dade Conveyance Canals Project authorized by the Flood Control Act (FCA) of 1968 PL 90-483. This Act authorized modifications to the existing C&SF Project as previously authorized by the FCAs of 1948 (PL 80-858) and 1962 (PL 87-874). Further modifications to the C-111 were authorized as an addition to the C&SF project in the Water Resources Development Act (WRDA) of 1996 (PL 104-303). The C-111 South Dade Integrated GRR and EIS was published in May 1994 (USACE 1994). This report described a conceptual plan for five pump stations and levee-bounded retention/detention areas to be built west of the L-31N Canal, between the 8.5 SMA and the Frog Pond Area to control seepage out of ENP while providing flood mitigation to agricultural lands east of C-111 Canal (**FIGURE 2**). The original and existing configuration of these structural features are described in detail in the 2006 Interim Operational Plan (IOP) for Protection of the Cape Sable Seaside Sparrow Final Supplemental EIS (USACE 2006) and the 2012 EA for the expansion of the C-111 South Dade NDA (USACE 2012b).

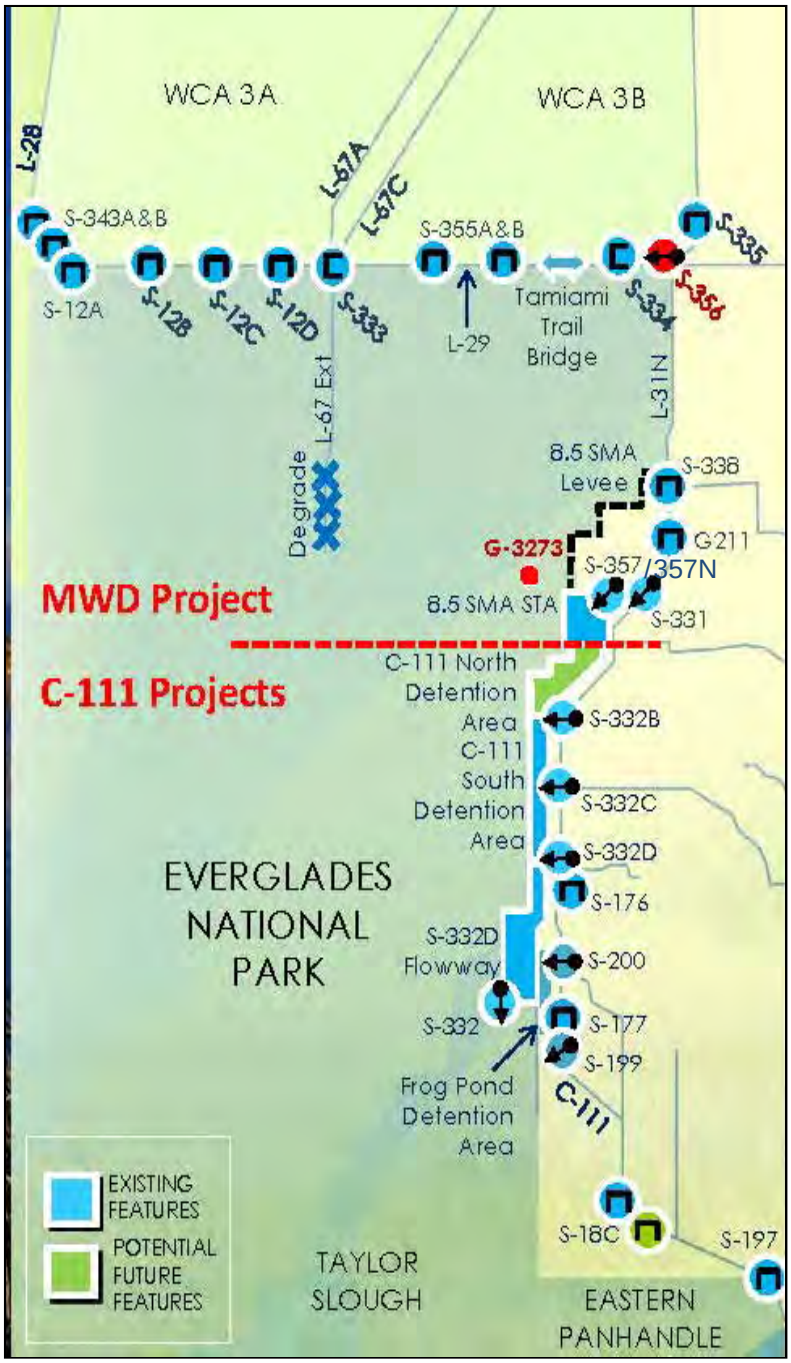

FIGURE 2. RELEVANT C&SF PROECT FEATURES OF THE MWD PROJECT AND C-111 SOUTH DADE PROJECTS

Much of the MWD Project has been completed, including the 8.5 SMA Project, construction of S-355A and B, S-333 and S-334 modifications, S-356, Tiger Tail camp raising, removal of four miles of the L-67 Extension Levee, and Tamiami Trail modifications. However, some features originally included in the 1992 MWD GDM and Final EIS, including features to provide hydrologic connectivity between WCA 3A and WCA 3B and complete degradation of the L-67 Extension Levee and adjacent canal, have not been completed for various reasons, including

operational (water levels) constraints within WCA 3B, lowered MWD maximum operational stages for the L-29 Canal (9.7 feet National Geodetic Vertical Datum of 1929 [NGVD] was assumed with the 1992 MWD GDM and Final EIS), and potential water quality concerns.

Constructed features of the C-111 South Dade Project include the detention areas 332-B, 332-C and 332-D, the L-320 and L-322 levees which form the east and west boundary of the C-111 South Dade buffer area from S-332 D north to S-332 C, and the L-323 levee which completes the S-333 B-C connector and forms a secondary buffer area east of the C-111 South Dade area.

Operations in the project area are currently governed by the WCAs, ENP, ENP to South Dade Conveyance System (SDCS) Water Control Plan (USACE 2012c). The Corps, Jacksonville District, is initiating the Gage-3273 (G-3273) and S-356 operations field test to raise the current operational stage constraint for G-3273, and operate the S-356 pump station to return seepage from NESRS to the adjacent L-31N Canal. The field test will also implement a testing protocol to assist in defining operating criteria for the new 8.5 SMA S-357N water control structure following completion of construction. The MWD Increment 1 Field Test will be the first increment in a series of three related, sequential efforts that will result in a comprehensive integrated water control plan, referred to as the Combined Operating Plan (COP), for the operation of the water management infrastructure associated with the MWD and C-111 South Dade Projects.

The first increment will maintain the current 7.5 feet NGVD maximum operating limit in the L-29 Canal. Information and operational criteria identified from the field test (Increment 1) will be used to develop an expanded set of operations and monitoring criteria for a subsequent operational field test (Increment 2) that will raise the maximum operating limit in the L-29 Canal level above 7.5 feet NGVD, up to a maximum of 8.5 feet NGVD, as outlined in the 1992 MWD GDM and Final EIS (USACE 1992). The third increment is development of the COP that incorporates constructed features of the MWD and C-111 South Dade Projects into the WCAs-ENP-SDCS Water Control Plan (USACE 2012c). Increment 3 will be informed by the Increment 1 and Increment 2 field tests.

4.0 PROJECT NEED OR OPPORTUNITY

The overarching project need is to increase the availability of S-333 to increase water deliveries from WCA 3A to ENP through NESRS for the benefit of natural resources. A small incremental step toward achieving that goal is to reduce the number of times S-333 discharges are limited by the existing G-3273 stage constraint of 6.8 feet NGVD. G-3273 lies within eastern ENP, directly west of the 8.5 SMA (**FIGURE 1**). The G-3273 constraint of 6.8 feet, NGVD exists as a flood protection measure. A stage of 6.8 feet NGVD at this gage has been used since 1985 as a trigger to cease S-333 discharges from flowing south into NESRS as a protective measure for residential areas to the east, particularly the 8.5 SMA. Since many of the MWD features have been built, including the protective levee around the 8.5 SMA and much of the C-111 South Dade Project detention areas to the south, there are more opportunities to begin relaxation of the G-3273 constraint and subsequent increased water deliveries from WCA 3A into NESRS.

The releases from S-333 are part of a regulation schedule for WCA 3A and are typically dependent on the Interim Operational Procedure for Restricted Rain-Driven Water Deliveries to

ENP via NESRS (Rainfall Plan) outlined in the WCAs-ENP-SDCS Water Control Plan (USACE 2012c). This Rainfall Plan consists of a rainfall-based delivery formula that specifies the amount of water to be delivered to ENP in weekly volumes through the S-333 and S-12s. Currently, the flow distribution is 55% through S-333 into NESRS and 45% through the S-12s into ENP west of the L-67 extension levee; however, during the dry season non-regulatory target flows are 80% through S-333 and 20% through the S-12 structures. Releases through the S-333 are limited by the constraint at G-3273 under the current WCAs-ENP-SDCS Water Control Plan (USACE 2012c). Therefore, when G-3273 is below 6.8 feet NGVD, 55% of wet season and 80% of dry season Rainfall Plan target flow is released into NESRS. However, when G-3273 is above 6.8 feet NGVD, S-334 is used to pass all or partial S-333 flows through SDCS, thereby preventing water from entering NESRS. When S-333 is closed and partial flows cannot be passed through S-334, the volume of flow that could not be delivered at S-333 shifts to the S-12s. In this manner, the G-3273 constraint limits the volume of water entering NESRS. The proposed modification to the G-3273 constraint is anticipated to reduce the number of times that S-333 discharge is reduced and increase the number of times the maximum (*i.e.* 55% of wet season or 80% of dry season) Rainfall Plan deliveries from WCA 3 through S-333 into NESRS are achieved.

The current WCAs-ENP-SDCS Water Control Plan (USACE 2012c) does not contain water management operating criteria for the planned spillway (S-357N) located in the 8.5 SMA upstream of S-357, at the intersection of C-357 and the newly constructed seepage collection canal (C-358) (**FIGURE 2**). The 2012 Design Refinement for the 8.5 SMA EA did not address water management operating criteria for S-357N or C-358 and stated that all gates would be in the closed position until a new operational protocol is developed for the MWD Project (USACE 2012a). Interim water management operating criteria for the planned 8.5 SMA gated culvert S-35N will be implemented in conjunction with Increment 1.

Information obtained from Increment 1, if successful with achievement of field test goals and objectives will be codified within the current WCAs-ENP-SDCS Water Control Plan (USACE 2012c). In addition, information obtained through Increment 1 will be used to support development of a second field test (Increment 2) and subsequent consideration of future incremental modifications to the current WCAs-ENP-SDCS Water Control Plan (USACE 2012c).

5.0 PROPOSED ACTION

Summary details of the Proposed Action are listed below:

- The L-29 Canal will be managed to prevent a sustained stage above 7.5 feet NGVD (average of S-333 tail water and S-334 headwater), which is the maximum operating stage intended within the current WCAs-ENP-SDCS Water Control Plan (USACE 2012c). This will be achieved by stopping inflow into the L-29 Canal when the L-29 Canal stage rises above 7.5 feet NGVD.

- Both S-333 and S-356 releases to the L-29 Canal will be subject to the 7.5 feet NGVD constraint however, the water level at G-3273 will no longer be a constraint, allowing

NESRS to receive additional water year-round, pursuant to the WCA 3A Regulation Schedule and Rainfall Plan.

- The 6.8 feet NGVD water level at G-3273 and the WCA 3A stage level (as measured using the average of monitoring gauges/sites 63, 64, and 65) will be utilized to define the priority of releases from S-333 and S-356 to the L-29 Canal and NESRS. In addition, the field test Action Line is a seasonally varying WCA 3A stage (10.0 to 10.75 feet, NGVD) which will also serve to define the S-333 and S-356 releases to the L-29 Canal and NESRS.

- S-355 A and S-355 B may be utilized to discharge to the L-29 Canal as indicated under current operations and other future associated permit requirements.

- Implementation of a testing protocol for S-357N will be incorporated into the field test following completion of the C-358 seepage collection canal and the associated S-357N control structure.

- Additional low volume releases from S-197 are expected. The S-178 Tail Water is used as a trigger to define the opening criteria for S-197 discharges. The Proposed Action reduces the current WCAs-ENP-SDCS Water Control Plan (USACE 2012c) Level 1 S-197 opening from 800 to 500 cubic feet per second. Operating criteria for S-197 will revert to the operating criteria in the current WCAs-ENP-SDCS Water Control Plan (USACE 2012c) once Contracts 8 and 9 of the C-111 South Dade Project are constructed and operable.

- Test duration will be a minimum of one year. If weather conditions during the one year test period do not provide sufficient data for a conclusive field test, the test may be extended up to one year for a maximum of two years.

Further detailed information on the Proposed Action can be found in the G-3273 Constraint Relaxation/S-356 Field Test and S-357N Operational Strategy (**Appendix A**).

6.0 EFFECT DETERMINATIONS TO FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES

The Corps requested written confirmation of federally listed threatened and endangered species that are either known to occur or are likely to occur within the project area from the U.S. Fish and Wildlife Service (USFWS) by letter dated August 22, 2014. Concurrence on the presence of listed species was received on September 11, 2014. The USFWS provided an update to the concurrence letter on December 17, 2014. The Corps has determined that the Proposed Action may affect, but is not likely to adversely affect, Cape Sable Seaside Sparrow (CSSS) (*Ammodramus maritimus mirabilis)* and its associated critical habitat; Everglade snail kite (*Rostrhamus sociabilis plumbeus)* and its associated critical habitat; wood stork (*Mycteria americana)*; Florida bonneted bat (*Eumops floridanus*); Deltoid spurge (*Chamaesyce deltoidea* spp. *Deltoidea)*; Garber's spurge *Chamaesyce garberi)*; Small's milkpea (*Galactia smallii)*; and Tiny polygala (*Polygala smallii*). Effects determinations for federally threatened and

endangered species within the project area are listed within **TABLE 1**. These determinations are based on the short duration of the field test and the generally beneficial nature of this action.

Terms and Conditions within the USFWS Biological Opinion (BO) on the Everglades Restoration Transition Plan (ERTP) required the Corps to initiate the planning process to begin field testing and relaxing or removing the existing G-3273 gage constraint of 6.8 feet NGVD in order to be exempt from the prohibitions of Section 9 of the Endangered Species Act (ESA) (USFWS 2010).

TABLE 1. FEDERALLY THREATENED AND ENDANGERED SPECIES WITHIN THE PROJECT AREA AND EFFECTS DETERMINATION OF THE PROPOSED ACTION

Common Name	Scientific Name	Status	May Affect, Likely to Adversely Effect	May Affect, Not Likely to Adversely Effect	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
Gopher tortoise	*Gopherus polyphemus*	C			X
Green sea turtle*	*Chelonia mydas*	E			X
Hawksbill sea turtle*	*Eretmochelys imbricate*	E			X

Kemp's Ridley sea turtle*	*Lipodochelys 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*	C			X
Elkhorn coral	*Acropora palmata*	T, CH			X
Florida leafwing butterfly	*Anaea troglodyta floridalis*	C			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. *okeechobeenis*	E			X
Small's milkpea	*Galactia smallii*	E		X	
Tiny polygala	*Polygala smallii*	E		X	
Big pine partridge pea	*Chamaecrista lineata* var. *keyensis*	C			X
Blodgett's silverbush	*Argythamnia blodgettii*	C			X
Cape Sable thoroughwort	*Chromolaena frustrata*	E, CH			X
Carter's small-flowered flax	*Linum carteri* var. *carteri*	E, Pr CH			X
Everglades	*Sideroxylon*	C			X

bully	*reclinatum* spp. *austrofloridense*				
Florida brickell-bush	*Brickellia mosieri*	E, Pr CH			X
Florida bristle fern	*Trichomanes punctatum* spp. f*loridanum*	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*	C			X

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

* Marine species under the purview of the National Marine Fisheries Service (NMFS), the Corps will conduct a separate consultation with NMFS.

6.1 Florida Panther and "No Effect 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. 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. 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 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. Habitat loss has driven the subspecies into a small area, where the few remaining animals are highly inbred, causing such genetic flaws as heart defects and sterility.

Implementation of the Proposed Action would not result in significant effects to Florida panther. Lands have been designated for panther conservation (**FIGURE 3**). These lands include the Panther Focus Area located in central and southern Florida. Preferred habitat consists of cypress swamps, pine, and hardwood hammock forests. Florida panthers presently inhabit lands in ENP adjacent to the Southern Glades, and radio tracking studies have shown that they venture into the Southern Glades on occasion during post-breeding dispersion (**FIGURE 4**). The field test is

expected to benefit ENP by increasing flows to NESRS. By reducing limitations on S-333, potentially more water will be delivered to NESRS.

The Proposed Action is expected to increase the number of unconstrained discharges from WCA 3A to NESRS by up to 1,176 days, a 64% increase relative to the current WCAs-ENP-SDCS Water Control Plan (USACE 2012c). During Increment 1, the stage elevations experienced at G-3273 and other locations within NESRS are expected to be similar to the intra-annual range of water stages experienced under recent C&SF Project operations. The duration at which water stages at G-3273 exceed 6.8 feet NGVD is expected to increase, however, this is not expected to have any effect on Florida panther or its habitat. Elimination or modification to panther habitat within ENP is not expected under the field test. Conversion of upland habitat is not proposed. The Florida panther is a wide-ranging species with the majority of sightings west of the project area. The Corps has determined that there would be no effect on this species from implementation of the Proposed Action.

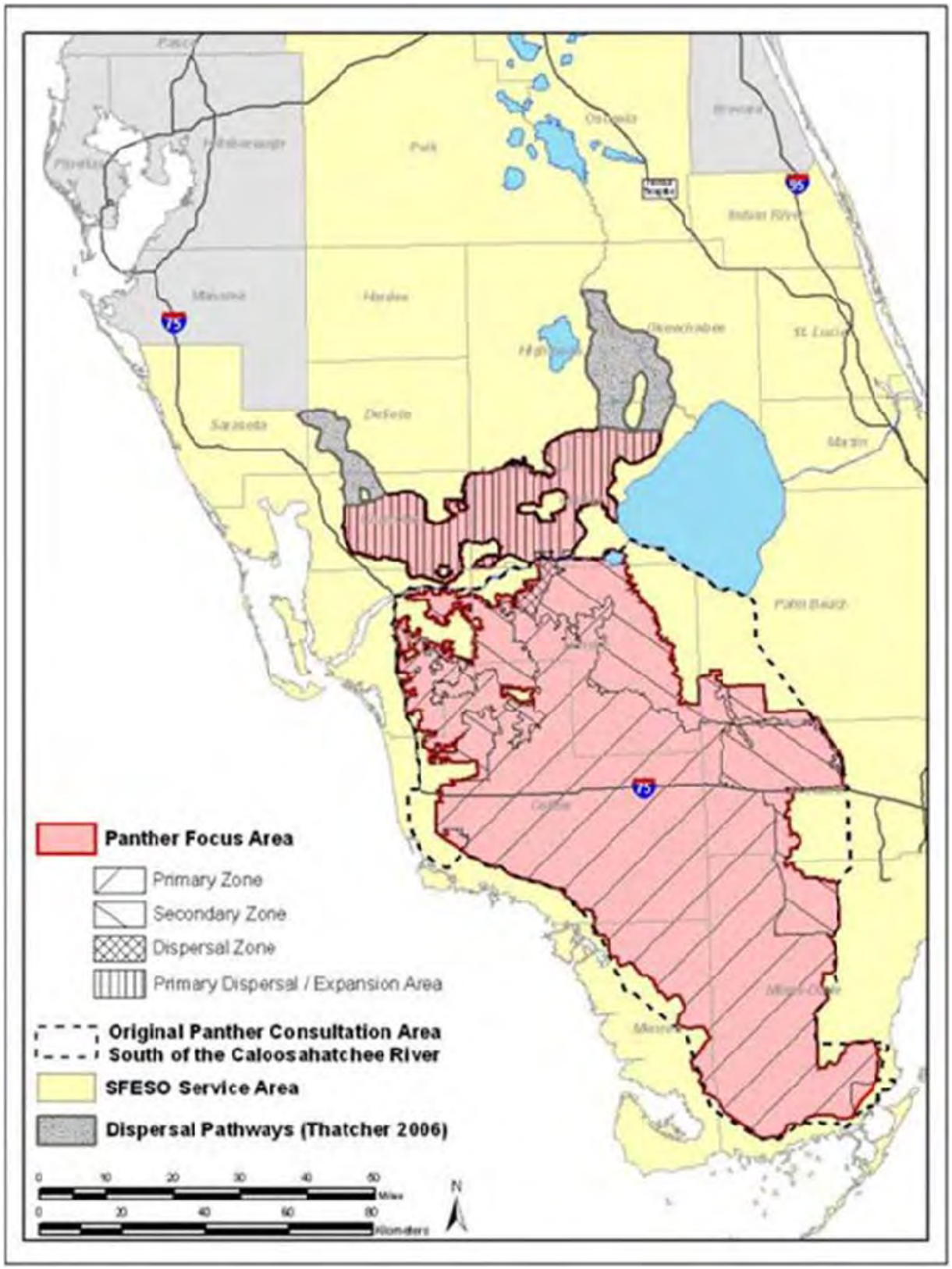

FIGURE 3. FLORIDA PANTHER ZONES IN SOUTH FLORIDA

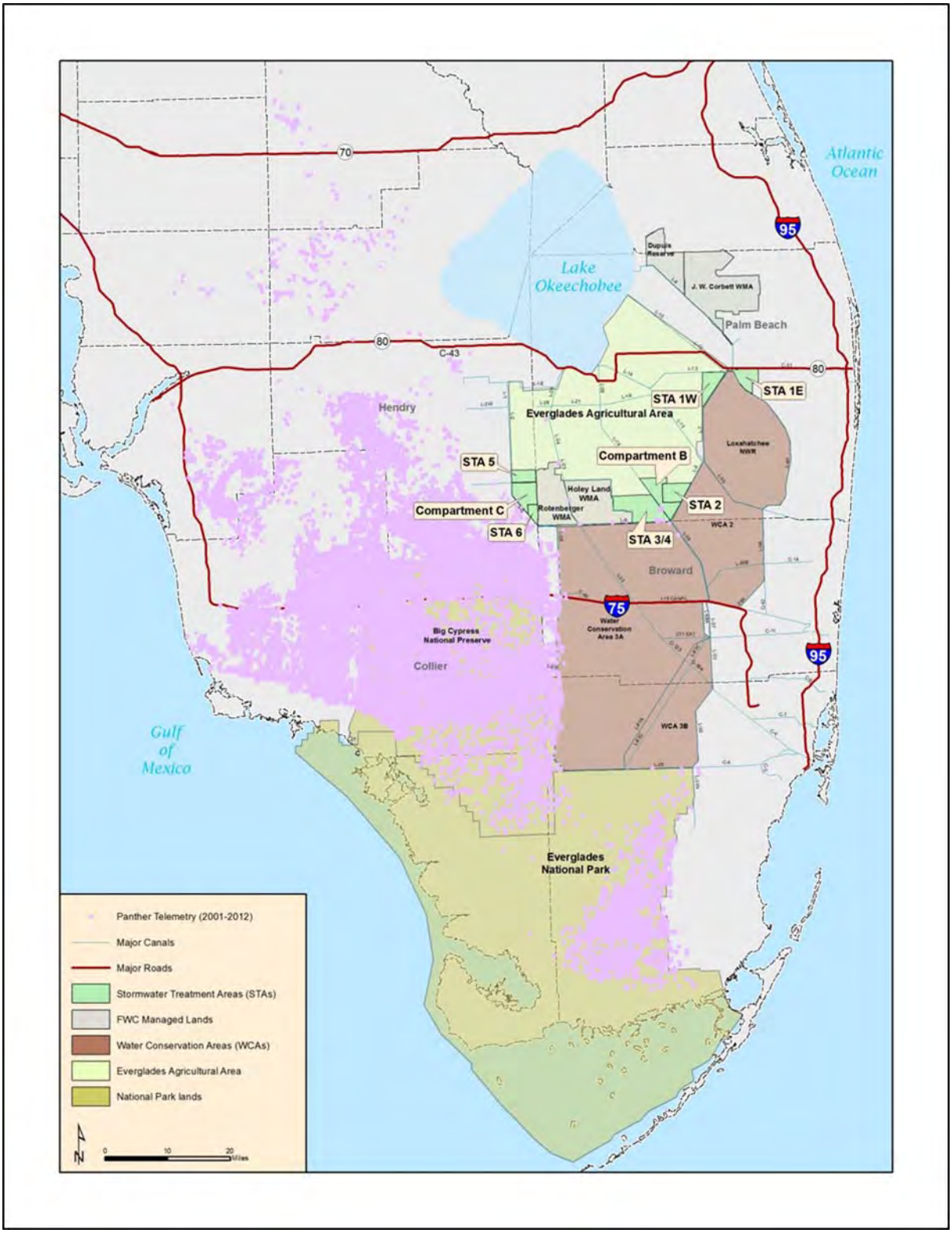

FIGURE 4. FLORIDA PANTHER TELEMETRY INFORMATION FROM 2002 TO 2012

6.2 Florida Manatee and Critical Habitat and "No Effect Determination"

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

Over the past centuries, the principal sources of Florida manatee mortality have been opportunistic hunting by man and deaths associated with unusually cold winters. Today, poaching is rare, but high mortality rates from human-related sources threaten the future of the species. In general, the largest single mortality factor is collision with boats and barges. Florida manatees also are killed in flood gates and canal locks, by entanglement or ingestion of fishing gear, and through loss of habitat and pollution (Florida Power and Light 1989).

Florida manatees have been observed in conveyance canals within the project area, specifically in the lower C-111 Canal just downstream of S-197; and adjacent nearshore seagrass beds throughout Florida Bay including all waters of Card, Barnes, Blackwater, Little Blackwater, Manatee and Buttonwood sounds. The extensive acreages of seagrass beds in Florida Bay provide important feeding areas for Florida manatees. Florida manatees also depend upon canals as a source of freshwater and resting sites and as a source of cold-weather refuge. The relatively deep waters of the canals respond more slowly to temperature fluctuations at the air/water interface than the shallow bay waters. Thus, the canal waters remain warmer than open bay waters during the passage of winter cold fronts. **FIGURE 5** illustrates canals that Florida manatees have access to within south Florida.

The Florida manatee's critical habitat includes all waters of Card, Barnes, Blackwater, Little Blackwater, Manatee and Buttonwood sounds between Key Largo, Monroe County and mainland Miami-Dade County (**FIGURE 6**). Another component of designated critical habitat is defined as Biscayne Bay, and all adjoining and connected lakes, rivers, canals, and waterways from the southern tip of Key Biscayne northward to and including Maule Lake, Dade County. This was one of the first designations of critical habitat for an endangered species and the first for an endangered marine mammal. No specific primary or secondary constituent elements were included in the critical habitat designation. However, researchers agree that essential habitat features for Florida manatee include seagrasses for foraging, shallow areas for resting and calving, channels for travel and migration, warm water refuges during cold weather and freshwater for drinking (FWS 2001).

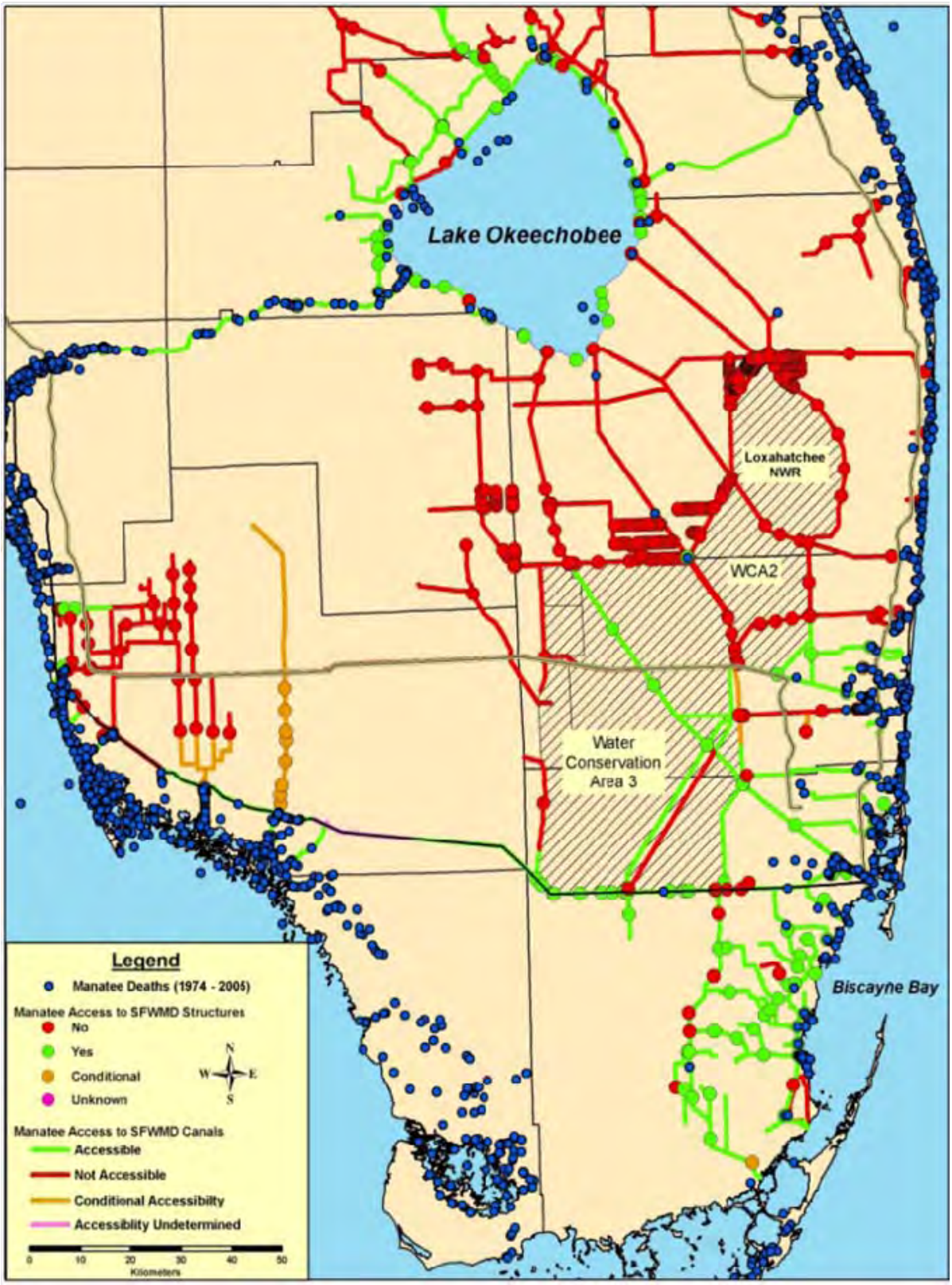

FIGURE 5. CANALS THAT FLORIDA MANATEES HAVE ACCESS TO WITHIN SOUTH FLORIDA

FIGURE 6. FLORIDA MANATEE CRITICAL HABITAT

The S-197 structure (**FIGURE 7**) provides a gravity outlet for stormwater runoff for the SDCS during flood conditions and acts as a barrier to prevent saltwater intrusion into the freshwater wetlands. Under the Proposed Action, the frequency of S-197 discharges potentially increase from 14 days to a range of 39 to 82 days and the volume of S-197 discharges potentially increases between 20,000 to 30,000 acre-feet, an increase of 11-67% relative to the current WCAs-ENP-SDCS Water Control Plan (USACE 2012c). Potential increases in the frequency of S-197 discharges under the Proposed Action are expected to occur primarily during the wet season (June-November). These low volume releases are not anticipated to have major adverse effects on the receiving estuaries of Manatee Bay and Barnes Sound.

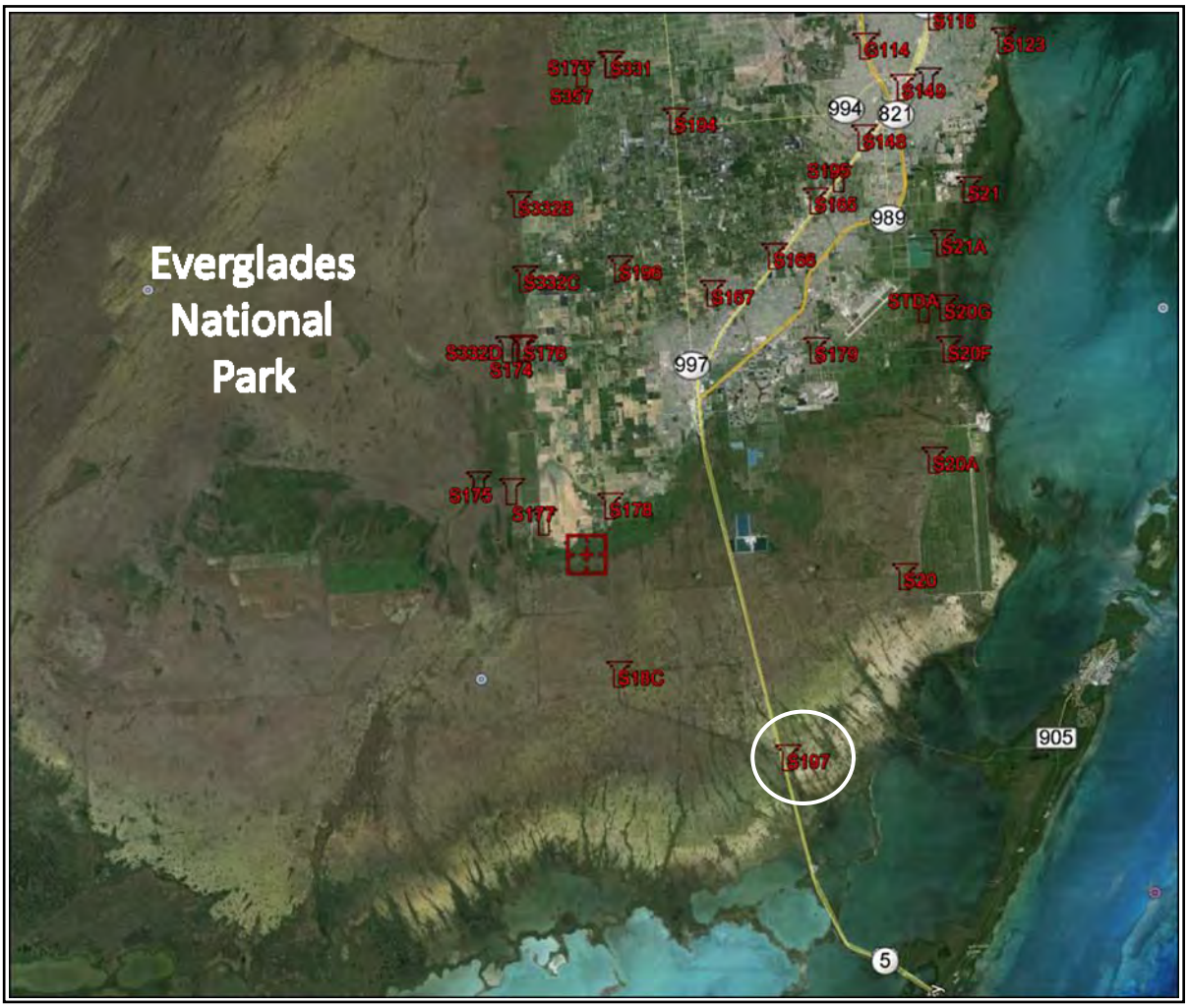

FIGURE 7. LOCATION OF S-197 STRUCTURE

Nearshore salinity conditions within the coastal estuaries are elevated much of the year as a result of the less than adequate freshwater flow deliveries. Overland flow of freshwater into coastal estuaries is preferred as compared with point source discharges through the S-197 structure, however; low volume releases to Manatee Bay and Barnes Sound through this structure are considered preferential to high volume releases which result in increased incidence of large salinity swings as well as high nutrient load delivery. Manatee Bay and Barnes Sound

are relatively large bodies of water with open connections to Card Sound and the Atlantic Ocean. Waters within Manatee Bay and Barnes Sound have been documented to have shorter residence times relative to northeastern Florida Bay (Marshall 2014). In addition, these areas experience greater tidal flushing relative to northeastern Florida Bay. Potential salinity fluctuations due to implementation of the Proposed Action would be temporary and spatially limited to nearshore areas. Scouring of bottom sediments and significant increases in turbidity resulting in diminished light penetration through the water column and potential impacts to seagrasses within Manatee Bay and Barnes Sound are not expected. Low volume releases at S-197 have the potential to decrease flows to Taylor Slough, and subsequently Florida Bay. Currently, water which discharges from S-18C (**FIGURE 7**) are allowed to flow over the scraped down canal banks into ENP's Eastern Panhandle towards the tidal creeks feeding into Long Sound and Joe Bay. The Proposed Action is not expected to result in significant stress to seagrasses within the coastal estuaries due to the limited volume of S-197 discharges and the temporary nature of the operational changes being considered. Seagrasses have an optimum salinity range of 24 to 35 practical salinity unit (psu), but can tolerate considerable short-term salinity fluctuations. Based on the above information and the fact that Increment 1 includes a robust monitoring plan, the Corps has determined that there would be no effect on the Florida manatee and its designated critical habitat from implementation of the Proposed Action. The Corps will monitor existing salinity gages in Joe Bay, Long Sound, Manatee Bay, and Barnes Sound throughout the duration of the field test (**Appendix C**). In addition, the Corps will continue to implement Periodic Scientists Calls as outlined within the 2011 ERTP Final EIS and will include assessment of conditions within the southern estuaries.

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

The Florida bonneted bat is Florida's largest bat, weighing approximately 1.1 to 2.0 ounces, with a 19 to 21 inch wingspan, and a body length of 5.1 to 6.5 inches. The species has dark brown fur and large broad ears that join together and slant forward over the eyes. Relatively little is known regarding the ecology and habitat requirements of this species. In general, bats will forage over ponds, streams and wetlands and require roosting habitat for daytime roosting, protection from predators and rearing of young (Marks and Marks 2008). Florida bonneted bats roost in tree cavities, rocky outcrops and dead palm fronds. In residential communities, the bats roost in Spanish tile roofs, but have also been found in attics, rock or brick chimneys and fireplaces of old buildings (NatureServe 2009). Colonies are small, with the largest reported as just a few dozen individuals. The bat is a nocturnal insectivore and relies upon echolocation to navigate and detect prey. Females give birth to a single pup from June through September (Scott 2004); however limited data suggests that a female may undergo a second birthing season possibly in January or February.

The Florida bonneted bat is Florida's only endemic bat. The range of this species is limited to southern Florida, although this species was encountered in 2008 in two locations within the Kissimmee River Wildlife Management Area north of Lake Okeechobee. The Florida bonneted bat has only been documented in 12 locations within Florida, including Coral Gables, Homestead, Naples, Everglades City, and North Fort Myers. Seven of the locations are under public ownership with the Florida bonneted bat found in discrete and specific areas within Big Cypress National Preserve, Fakahatchee Strand Preserve State Park, Kissimmee River Wildlife

Management Area, Babcock Ranch and Fred C. Babcock and Cecil M. Webb Wildlife Management Area. Florida bonneted bats roost in tree cavities, rocky outcrops and dead palm fronds. In residential communities, the bats roost in Spanish tile roofs, but have also been found in attics, rock or brick chimneys and fireplaces of old buildings (NatureServe 2009).

The USFWS has defined consultation areas and focal areas for the Florida bonneted bat in south Florida (**FIGURE 8**). The main action area falls within a defined focal area. At present, no active, natural roost sites are known within the main action area. All active, known roosts are bat houses. Impacts to potential roost sites are not anticipated under the field test. Based on the 2013 Florida Bonneted Bat USFWS Consultation guidelines, the Corps has determined that implementation of the Proposed Action may affect, but is not likely to adversely affect, this species.

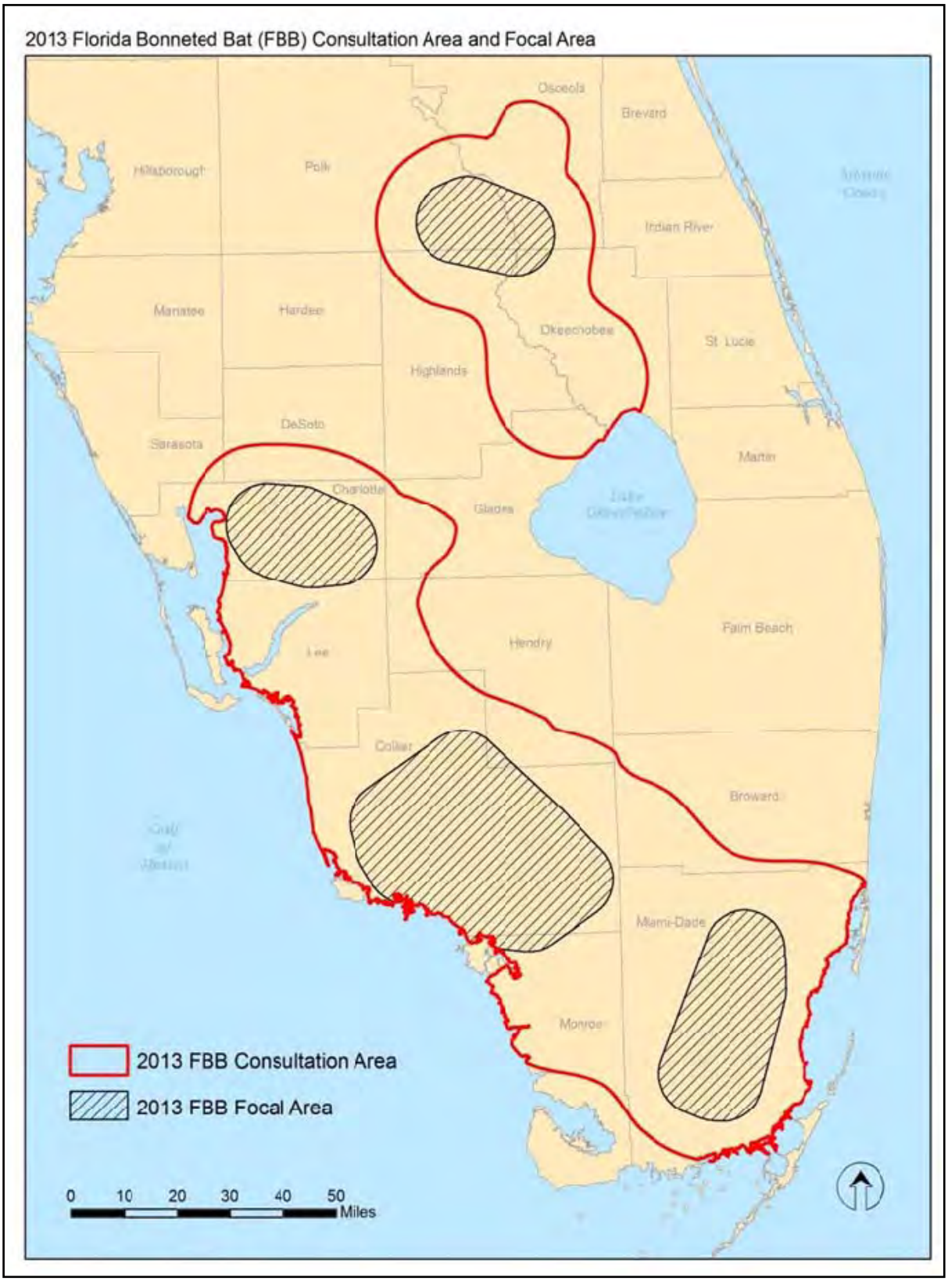

FIGURE 8. FLORIDA BONNETED BAT CONSULTATION AREA

6.4 Cape Sable Seaside Sparrow and Critical Habitat and "May Affect Not Likely to Adversely Affect Determination"

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

CSSS prefer mixed marl prairie communities that include muhly grass (*Muhlenbergia filipes*) for nesting (Stevenson and Anderson 1994). Marl prairie communities have short-hydroperiods (the period of time during which a wetland is covered by water) and contain a mosaic of moderately dense, clumped grasses, interspersed with open space that permit ground movements by the sparrows (USFWS 1999). CSSS are generally not found in communities dominated by dense sawgrass, cattail (*Typha* spp.) monocultures, long-hydroperiod wetlands with tall, dense vegetative cover, spike rush marshes, and sites supporting woody vegetation (Werner 1975, Kushlan and Bass 1983). CSSS also avoid sites with permanent water cover (Curnutt and Pimm 1993). The combination of hydroperiod and periodic fire events are critical in the maintenance of suitable mixed marl prairie communities for the CSSS (Kushlan and Bass 1983).

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

Successful CSSS breeding requires that breeding season water levels remain at or below ground level in the breeding habitat. Nott et al. (1998) cited a "10-centimeter (cm)" rule for maximum water depth over which the CSSS will initiate nesting. This conclusion was based upon observations within the ENP range-wide survey in which no singing males were heard when water depths exceeded that level. However, Dean and Morrison (1998) demonstrated that nesting may occur when average water depths exceed this rule. CSSS construct their nests relatively close to the ground in clumps of grasses composed primarily of muhly, beakrushes (Rhynchospora spp.), and Florida little bluestem (Schizachyrium rhizomatum) (Pimm et al. 2002). The average early season nest height is 17 cm (6.7 inches) above ground, while the average late season nest height is 21 cm (8.3inches) above ground (Lockwood et al. 2001). The shift in average nest height after the onset of the wet season rainfall pattern, which typically begins in early June (Lockwood et al. 2001), appears to be an adaptive response to rising surface water conditions. In general, the CSSS will raise one or two broods within a season; however, if weather conditions permit, a third brood is possible (Kushlan et al. 1982, USFWS 1983). A new nest is constructed for each successive brood. The end of the breeding season is triggered by the onset of the rainy season when ground water levels rise above the height of the nest off the ground (Lockwood et al. 1997).

CSSS will lay three to four eggs per clutch (Werner 1978, Pimm et al. 2002) with a hatching rate ranging between 0.66 and 1.00 (Boulton et al. 2009b). The nest cycle lasts between 34 and 44 days in length and includes a 12-13 day incubation period, 9-11 day nestling period and 10-20 days of post-fledgling care by both parents (Sprunt 1968, Trost 1968, Woolfenden 1968, Lockwood et al. 1997, Pimm et al. 2002). Nest success rate varies between 21 and 60 percent, depending upon timing of nest initiation within the breeding season (Baiser et al. 2008, Boulton et al. 2009a). Substantially higher nest success rates occur within the early portion of the breeding season (approximately 60 percent prior to June 1) followed by a decline in success as the breeding season progresses to a low of approximately 21% after June 1 (Baiser et al. 2008, Boulton et al. 2009a, Virzi et al. 2009). In most years, June 1 is a good division between the early high success period and the later, lower success period (Dr. Julie Lockwood email correspondence to USFWS, October 15, 2009). Nearly all nests that fail appear to fail due to predation, and predation rates appear to increase as water level increases (Lockwood et al. 1997, 2001, Baiser et al. 2008). A complete array of nest predators has not been determined. However, raccoons (Procyon lotor), rice rats (Oryzomys palustris), and snakes may be the chief predators (Lockwood et al. 1997, Dean and Morrison 1998, Post 2007).

A dietary generalist, CSSS feed by gleaning food items from low-lying vegetation (Ehrlich et al. 1992, Pimm et al. 2002). Common components of their diet include soft-bodied insects such as grasshoppers, spiders, moths, caterpillars, beetles, dragonflies, wasps, marine worms, shrimp, grass, and sedge seeds (Stevenson and Anderson 1994). The importance of individual food items appear to shift in response to their availability (Pimm et al. 1996, 2002).

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

Presently, the known distribution of the CSSS is restricted to two areas of marl prairies east and west of Shark River Slough in the Everglades region (within ENP and BCNP) and the edge of Taylor Slough in the Southern Glades Wildlife and Environmental Area in Miami-Dade County. ENP staff first undertook a comprehensive survey of the CSSS in 1981 to identify all areas where sparrows were present. This survey, hereafter referred to as the range-wide survey, resulted in the first complete range map for the CSSS (Bass and Kushlan 1982, Kushlan and Bass 1983). From the resulting range map, Curnutt et al. (1998) divided the CSSS into six separate subpopulations, labeled as A through F (**FIGURE 9**) with subpopulation A (CSSS-A) as the only subpopulation west of Shark River Slough (SRS).

Designated critical habitat for the CSSS includes areas of land, water, and airspace in the Taylor Slough vicinity of Collier, Dade, and Monroe counties, with the following components: those portions of ENP within T57S R36E, T57S R36E, T57S R37E, T58S R35E, T58S R36E, T58S

R37E, T58S R35E, T58S R36E, T59S R35E, T59S R36E, T59S R37E. Areas outside of ENP within T55S R37E Sec. 36, T55S R38E Sec. 31, 32, T56S R37E Sec. 1, 2, 11-14, 23-26, T56S R38E Sec. 5-7, 18, 19, T57S R37E Sec. 5-8, T58S R38E Sec. 27, 29-32, T59S R38E Sec. 4 (CFR Vol. 72, No. 214 / 11-6-07). Designated CSSS critical habitat is depicted in (FIGURE 9). Primary constituent elements include suitable soil, vegetation, hydrologic conditions, and forage base.

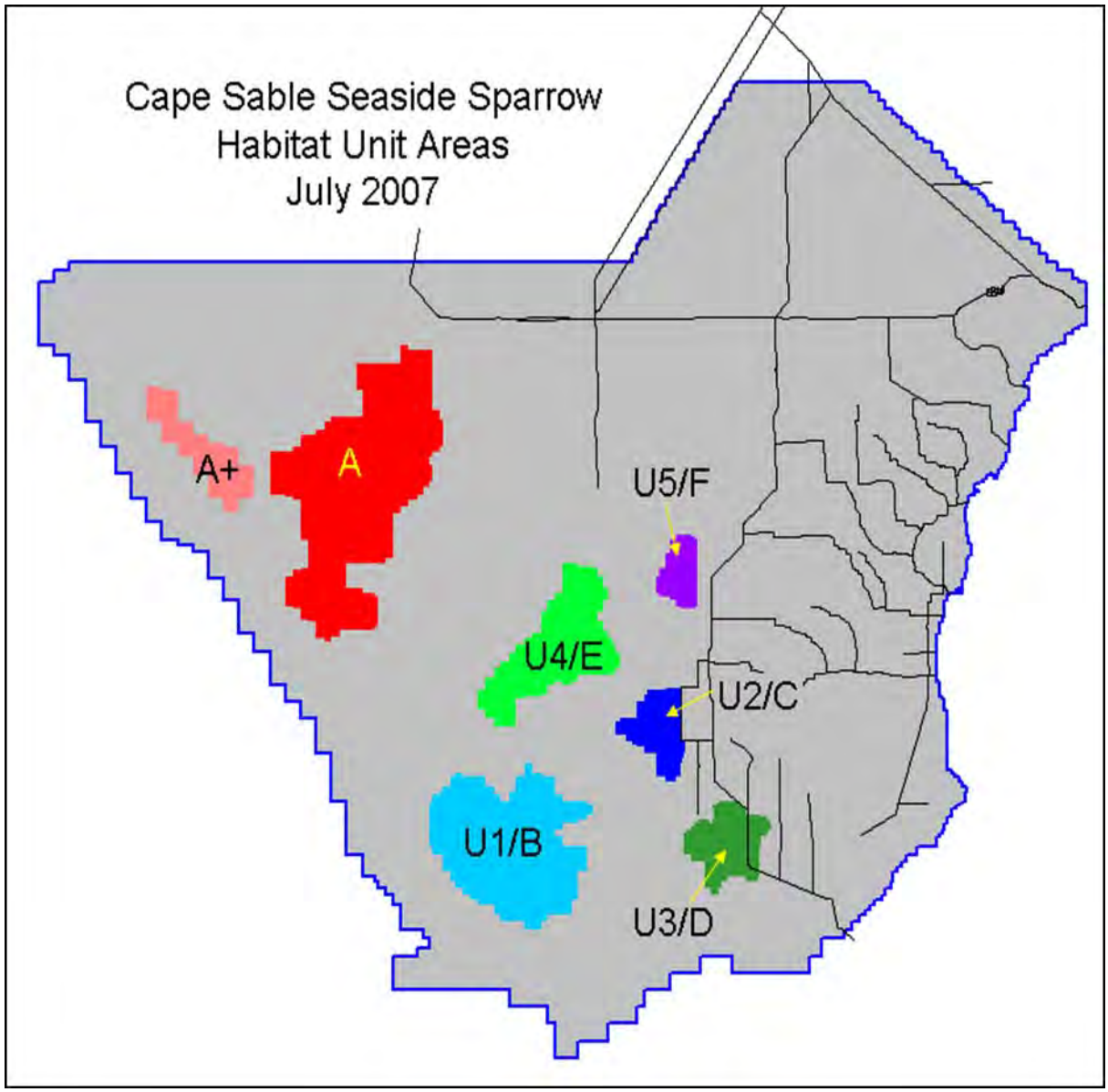

FIGURE 9. CAPE SABLE SEASIDE SPARROW SUBPOPULATIONS (A-F) AND DESIGNATED CRITICAL HABITAT UNITS (U1-U5)

1. Subpopulation A (CSSS-A) - Increased water in NESRS or within the C-111 Detention area may potentially affect CSSS habitat by increasing hydroperiod. The western marl

prairies, where CSSS-A resides may experience a backwater effect due to increased flows in NESRS with the Comprehensive Everglades Restoration Plan (CERP) (Corps 2007). The field test increases the G-3273 constraint from 6.8 feet NGVD to 7.5 feet NGVD, potentially allowing the S-333 flow volume to meet the Rainfall Plan Target of 55%, just a small fraction of the anticipated flows under the CERP. Additional water being delivered to NESRS may reduce the volume of flow through the S-12 structures, thereby increasing the likelihood of meeting the Rainfall Plan Target of 55%, and thereby limiting overflow to the S-12 structures. Based upon the temporary nature of the field test and the small increase in the G-3273 constraint, the Corps has concluded that the Proposed Action would have little, if any impact, on CSSS-A.

2. Subpopulation B (CSSS-B/Unit 1) - No effect would be anticipated. CSSS-B represents the largest sparrow subpopulation and has remained relatively stable since implementation of the Interim Operational Plan (IOP) in 2002. Wet prairie vegetation predominates within this unit (Ross, Sah and Snyder, et al. 2006). Due to its location downstream of the elevated pine rocklands, Unit 1 is relatively well protected from the managed water releases under ERTP. Consequently, implementation of the field test is not expected to alter designated critical habitat within Critical Habitat Unit 1 or affect the status of CSSS-B.

3. Subpopulation C (CSSS-C/Unit 2) – Habitat of varying suitability occurs within Unit 2. Long-hydroperiod marshes occur south of the S-332 pump station, while areas to the north are overdrained and prone to frequent fires. The most recent fire occurred in March 2007 when the Frog Pond fire swept through this area. The habitat has yet to fully recover (Sah et al. 2008, Virzi et al. 2009). The variable habitat conditions are thought to be a consequence of the 1980 construction of the S-332 pump station, located at the boundary of ENP and Taylor Slough. Unit 2 holds relatively few CSSS. Recent research has indicated that within Unit 2, CSSS-C is suffering from the ill-effects of small population size including fewer breeding individuals, male-biased sex ratios, lower hatch rates, and lower juvenile return rates (Boulton et al. 2009a, Virzi et al. 2009). IOP and subsequent ERTP Operations improved the hydrologic and habitat conditions within Unit 2. Through a reduction of seepage out of ENP, use of the S-332 Detention Areas has lessened the over-drying of potential sparrow habitat within Unit 2 (CSSS-C). The field test is expected to benefit ENP by increasing flows to NESRS.

4. Subpopulation D (CSSS-D/Unit 3) – Since 1981, when an estimated 400 CSSS resided within Unit 3, this subpopulation experienced a continual decline in population size (Cassey et al. 2007). CSSS-D is a small, dynamic subpopulation that fluctuates annually; occupancy within Unit 3 is low and detection probability is highly variable. Thought to be functionally extirpated in 2007 (Lockwood et al. 2007), CSSS were again encountered within this area in 2009 when Virzi et al. (2009) encountered four males and two females. However, in 2012, 14 birds were counted with a population estimate of 224, which is substantially higher than between the years 2007 and 2011. Prior to the 2012 survey, vegetation within this critical habitat unit was thought to be unsuitable for CSSS breeding. Since 2000, high water levels and longer hydroperiods have prevailed resulting in a sawgrass-dominated community interspersed with patches of muhly grass at higher

elevations (Ross et al. 2003). Field test water management operations may result in increased seepage to the L-31N Canal south of the S-331 pump station, prior to the construction and operation of the C-111 South Dade Project NDA. The additional volume of seepage to the L-31N Canal is expected to be primarily managed with the C-111 South Detention Area using S-332 B, S-332C, and S-332D, given the significant reduction in WCA 3A regulatory releases to the SDCS. Pumping at S-332D may result in more water in the vicinity of Critical Habitat Unit 3. However, due to the temporary nature of the field test and the fact that it would primarily occur during the wet season, water levels would not be affected during the CSSS breeding season.

5. Subpopulation E (CSSS-E/Unit 4) - Located along the eastern edge of SRS, Critical Habitat Unit 4 encompasses approximately 66 km^2. The Rocky Glades separate Unit 4 and CSSS-E from the other eastern subpopulations. Unit 4 holds the second greatest number of sparrows among all subpopulations. This unit is expected to be affected by an altered hydroperiod that is too long to support marl prairie habitat requirements. Due to its location, Unit 4 is relatively well protected from the managed water releases that occur under ERTP. Effects of IOP operations on Unit 4 have been relatively small and are expected to continue to be minor under relaxation of the G-3273 constraint. Therefore, the field test is not expected to alter the status of CSSS-E or its designated critical habitat due to the temporary nature of the test and limited operational changes.

6. Subpopulation F (CSSS-F/Unit 5) - The most easterly of all the CSSS critical habitat units, Unit 5 is located at the ENP boundary in close proximity to agricultural and residential development. Habitat within this critical habitat unit suffers from over-drainage, reduced water flow, exotic tree invasion and frequent human-induced fires (Ross, Sah and Snyder, et al. 2006, Lockwood, Ross and Sah 2003). To alleviate the perpetual drier conditions and its associated problems, increased water flows within this area are required. Increased water into NESRS of the volume anticipated by the field test is not expected to significantly improve conditions within Critical Habitat Unit.

Since 1999, through deviations, IOP and ERTP, USFWS has always maintained that moving water to the east through the historical flow path into NESRS was the solution to improve nesting and habitat conditions for CSSS. By reducing limitations on S-333, potentially more water will be delivered to NESRS. Implementation of the Proposed Action is not expected to alter the physical and biological features essential to the nesting success and overall conservation of the subspecies. In order to protect CSSS, structural closings implemented under 2006 IOP and preserved under 2012 ERTP will be retained under the field test. The action related hydrologic changes are expected to be temporary due to the limited duration of the field test. In addition, relaxation of the G-3273 constraint is a Term and Condition under the 2010 USFWS ERTP BO. The Proposed Action is expected to increase the number of unconstrained discharges from WCA 3A to NESRS by up to 1,176 days, a 64% increase relative to the No Action Alternative. Increased water in NESRS or within the C-111 South Dade Project Area may potentially affect CSSS habitat by increasing hydroperiod. All regulatory monitoring requirements included in the 2009 C-111 Western Spreader Canal Project BO and 2010 ERTP BO will continue as mandated within those opinions. However, the Corps proposes an additional assessment metric to examine potential hydrologic impacts within CSSS subpopulations and

critical habitat units (*i.e.* CSSS-F/Unit 5, CSSS-E/Unit 4, CSSS-C/Unit 2). See **Appendix C**. Additional evaluation is being proposed to measure potential direct effects of the field test within these locations. The Corps has determined that the implementation of the Proposed Action may affect, but is not likely to adversely affect, this subspecies.

6.5 Everglade Snail Kite and Critical Habitat and "May Affect Not Likely to Adversely Affect Determination"

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

Everglade snail kite habitat consists of freshwater marshes and the shallow vegetated edges of lakes where the apple snail (*Pomacea paludosa*), the Everglade snail kite's main food source, can be found. Snail kite populations in Florida are highly nomadic and mobile; tracking favorable hydrologic conditions and food supplies, and thus avoiding local droughts. Snail kites move widely throughout the primary wetlands of the central and southern portions of Florida. Snail kite nesting locations between 2001 and 2012 within south Florida are depicted in **FIGURE 10.** The Everglades snail kite is threatened primarily by habitat loss and destruction. Widespread drainage has permanently lowered the water table in some areas. This drainage permitted development in areas that were once Everglade snail kite habitat. In addition to loss of habitat through drainage, large areas of marsh are heavily infested with water hyacinth, which inhibits the Everglade snail kite's ability to see its prey.

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

Snail kite nesting primarily occurs from December to July, with a peak in February-June, but can occur year-round. Nesting substrates include small trees such as willow, cypress (*Taxodium* spp.), and pond apple, and herbaceous vegetation such as sawgrass, cattail, bulrush (*Scirpus*

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

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

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

Low water levels have an effect on Everglade snail kite nest success in WCA 3A (Cattau et al. 2008). If water levels become too low and food resources become too scarce, adults will abandon their nest sites and young (Sykes et al. 1995). Predation on nests is also higher when water levels are low. A strong relationship exists between annual minimum stage and juvenile Everglade snail kite survival rate (Martin et al. 2007, Cattau et al. 2008). Due to their inability to move large distances, juvenile Everglade snail kites rely upon the marshes surrounding their nests for foraging. If water levels within these marshes become too low to support foraging (due to low apple snail availability), juvenile survival will be diminished.

Recent scientific information has indicated that apple snail egg production is maximized when dry season low water levels are less than 50 cm (was previously 40 centimeters) but greater than 10 cm (Darby et al. 2002, USFWS 2010). Water depths outside this range can significantly affect apple snail recruitment and survival. If water levels are less than 10 cm, apple snails cease movement and may become stranded, hence they are not only unavailable to foraging Everglade snail kites; they are also unable to successfully reproduce. Depending upon the timing and duration of the dry down, apple snail recruitment can be significantly affected by the truncation of annual egg production and stranding of juveniles (Darby et al. 2008). Since apple snails have a 1.0 to 1.5-year life span (Hanning 1979, Ferrer et al. 1990, Darby et al. 2008), they only have one opportunity (*i.e.* one dry season) for successful reproduction. Egg cluster production may occur from February to November (Odum 1957, Hanning 1979, Darby et al. 1999); however, approximately 77% of all apple snail egg cluster production occurs between April and June (Darby et al. 2008). Dry downs during peak apple snail egg cluster production substantially reduce recruitment (Darby et al. 2008). The length of the dry down, age, and size of the apple snail are all important factors in apple snail recruitment and survival. Larger apple snails can survive dry downs better than smaller apple snails (Kushlan 1975, Darby et al. 2006, 2008).

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 (**FIGURE 11**). The designated area encompasses approximately 841,635 acres (340,598 hectares).

The field test is an operational plan that is expected to benefit ENP by increasing flows to NESRS. By reducing limitations on S-333, potentially more water will be delivered to NESRS. The Proposed Action is expected to increase the number of unconstrained discharges from WCA 3A to NESRS by up to 1,176 days, a 64% increase relative to the current WCAs-ENP-ENP to SDCS Water Control Plan (USACE 2012c). During the field test, stage levels experienced at G-3273 and other locations within NESRS are expected to be similar to the intra-annual range of water stages experienced under recent C&SF Project operations. The duration at which water stages at G-3273 exceed 6.8 feet NGVD is expected to increase. A potential increase in hydroperiods within NESRS may provide an overall net benefit for Everglade snail kites and apple snail habitat. Increases in volume into NESRS provide an opportunity for improved

vegetation, including expansion of sloughs and wet prairies, and contraction of sawgrass ridges. However, due to the short duration of this test, significant vegetation changes are not anticipated.

WCA 3A represents the largest and most consistently utilized portion of Everglade snail kite designated critical habitat. Over the past two decades, Everglade snail kites have shifted nesting activities to areas of higher elevation within WCA 3A in response to habitat degradation in traditional nesting areas resulting from prolonged high water levels. Nesting activity has shifted up the elevation gradient to the west, and has also moved south in response to recent increased drying rates, restricting current nesting to the southwest corner of WCA 3A. The field test includes a seasonally varying WCA 3A water level of 10.0 to 10.75 feet NGVD (*i.e.* Increment 1 Action Line), as measured by the three gage average, which will serve to define S-333 and S-356 releases to the L-29 Canal and NESRS. Implementation of an Action Line to manage high water conditions in WCA 3A, would prevent conditions of extreme high water levels and prolonged inundation periods within WCA 3A as a result of field test operations. Based on this information and the limited duration of the field test, the Corps has determined that implementation of the Proposed Action may affect, but is not likely to adversely affect, this species and its designated critical habitat.

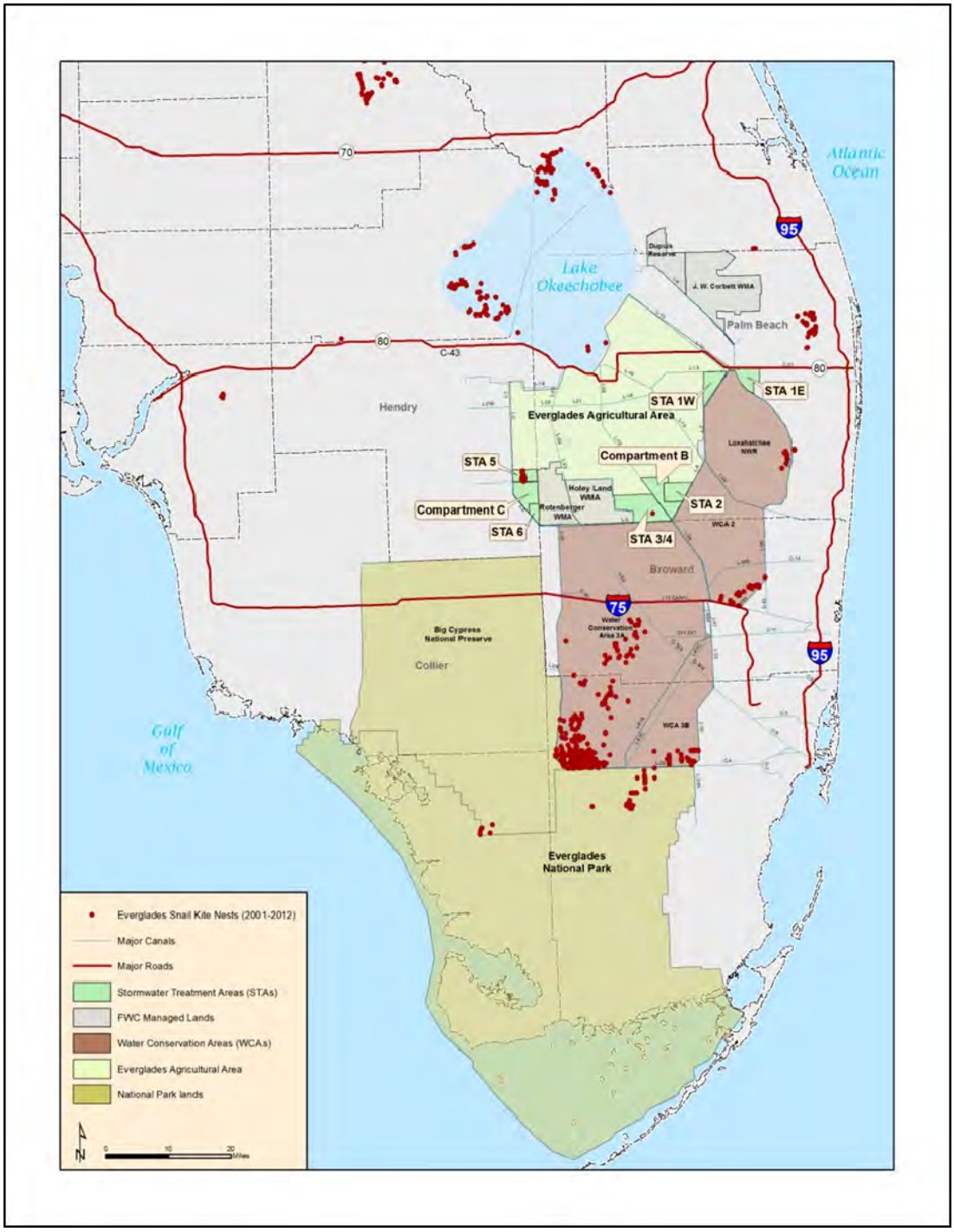

FIGURE 10. SNAIL KITE NESTING LOCATIONS BETWEEN 2001 AND 2012

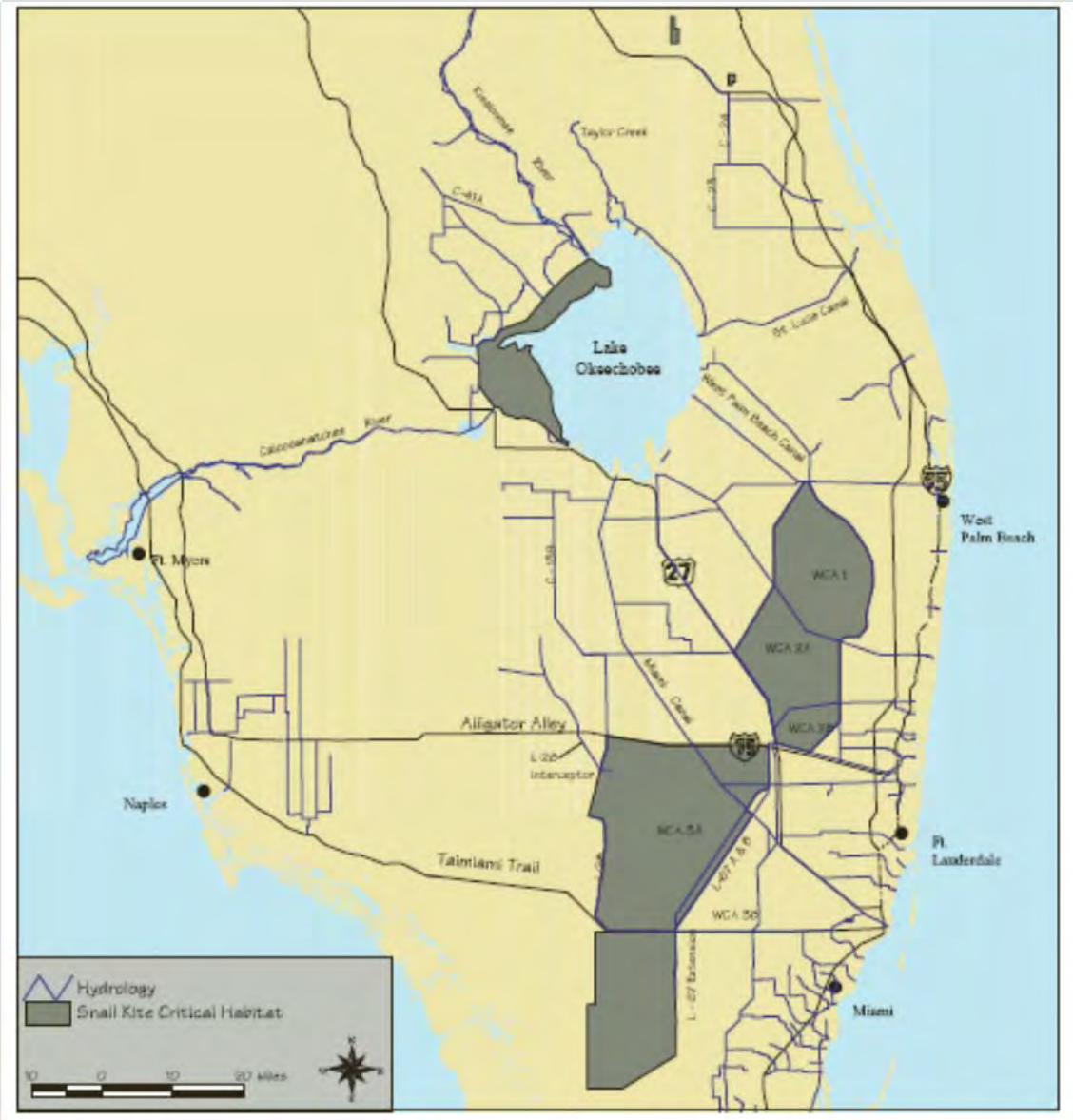

FIGURE 11. CRITICAL HABITAT FOR THE EVERGLADES SNAIL KITE

6.6 Piping Plover 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 and "No Effect Determination"

The red-cockaded woodpecker is identified by its conspicuous white cheek patch, black and white cross-barred back, black cap and nape, white breast and flanks with black spots. In addition, the males have a small bright red spot on each side of the black cap (USFWS 1999). Red-cockaded woodpeckers are a social species and live in groups with a breeding pair and up to four helpers, generally male offspring from the previous year. 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. Breeding pairs are monogamous and will raise a single brood each breeding season. Three to four small white eggs will be laid within the roost cavity and incubated by members of the group for a period of ten to twelve days. Chicks are also fed by members of the group and remain within the roost cavity for approximately 26 days. Insects including ants, caterpillars, moths, grasshoppers, spiders, and beetle larvae comprise approximately 85 percent of their diet. The remainder of their diet consists of wild grapes, cherries, poison ivy berries, blueberries, and nuts such as pecans (USFWS 1999).

Red-cockaded woodpeckers live in mature pine forests, specifically those with longleaf pines averaging 80 to 120 years old and loblolly pines averaging 70 to 100 years old. Destruction of its preferred long-leaf pine habitat by humans or disease (pines afflicted by fungus or red-ring rot) resulted in the woodpecker becoming listed as endangered in 1970. The current range is from eastern Texas to the southeastern United States and southern Florida. The red-cockaded woodpecker is primarily an upland species, also inhabiting hydric pine flatwoods. Due to lack of appropriate habitat within the project area, the Corps has determined that there would be no effect on this species from implementation of the Proposed Action.

6.8 Roseate Tern and "No Effect Determination"

The roseate tern is about 40 centimeters in length, with light-gray wings and back and a black cap. The rest of the body is white, with a rosy tinge on the chest and belly during the breeding season. The tail is deeply forked. A coastal species, the roseate tern nests on open sandy beaches away from potential predation and human disturbance. This species feeds in nearshore surf on small schooling fishes. In southern Florida, the roseate tern's main nesting areas are located in the Florida Keys and the Dry Tortugas where they nest on isolated islands, rubble islets, and dredge spoils. Due to the lack of appropriate habitat within the project area, the Corps has determined that there would be no effect on this species from implementation of the Proposed Action.

6.9 Wood Stork and "May Affect Not Likely to Adversely Affect Determination"

The wood stork is a large, white, long-legged wading bird that relies upon shallow, freshwater wetlands for foraging. 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 upgraded from endangered to threatened status under 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). During nesting, these areas must also be sufficiently close to the colony to allow wood storks to efficiently deliver prey to nestlings.

Wood storks feed almost entirely on fish between 2 and 25 cm (1 to 10 inches) in length (Kahl 1964, Ogden et al. 1976, Coulter 1987) but may occasionally consume crustaceans, amphibians, reptiles, mammals, birds, and arthropods. Wood storks generally use a specialized feeding behavior called tactilocation, or grope feeding, but also forage visually under some conditions (Kushlan 1979). Occasionally, wood storks stir the water with their feet in an attempt to startle hiding prey (Rand 1956, Kahl 1964, Kushlan 1979). This foraging method allows them to forage effectively in turbid waters, at night, and under other conditions when other wading birds that employ visual foraging may not be able to forage successfully.

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

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

Wood stork nesting habitat consists of mangroves as low as 1 meter (3 feet), cypress as tall as 30.5 meters (100 feet), and various other live or dead shrubs or trees located in standing water (swamps) or on islands surrounded by relatively broad expanses of open water (Rodgers et al. 1997, Coulter et al. 1999). Wood storks nest colonially, often in conjunction with other wading bird species, and generally occupy the large-diameter trees at a colony site (Rodgers et al. 1995). **FIGURE 12** shows the locations of wood stork colonies throughout Florida. The same colony site will be used for many years as long as the colony is undisturbed and sufficient foraging habitat remains in the surrounding wetlands. However, not all wood storks nesting in a colony will return to the same site in subsequent years (Kushlan and Frohring 1986). Natural wetland nesting sites may be abandoned if surface water is removed from beneath the trees during the nesting season (Rodgers et al. 1995). In response to this type of change to nest site hydrology, wood storks may abandon that site and establish a breeding colony in managed or impounded wetlands (Ogden 1991). Wood storks that abandon a colony early in the nesting season due to unsuitable hydrologic conditions may re-nest in other nearby areas (Borkhataria et al. 2004, Crozier and Cook 2004).

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

Breeding wood storks are believed to form new pair bonds every season. First age of breeding has been documented in 3 to 4-year-old birds but the average first age of breeding is unknown. Eggs are laid as early as October in south Florida and as late as June in north Florida (Rodgers 1990, USFWS 1999). A single clutch of two to five (average three) eggs is laid per breeding season but a second clutch may be laid if a nest failure occurs early in the breeding season (Coulter et al. 1999). There is variation among years in the clutch sizes, and clutch size does not appear to be related to longitude, nest data, nesting density, or nesting numbers, and may be

related to habitat conditions at the time of laying (Frederick 2009, Frederick et al. 2009). Egg laying is staggered and incubation, which lasts approximately 30 days, begins after the first egg is laid. Therefore, the eggs hatch at different times and the nestlings vary in size (Coulter et al. 1999). In the event of diminished foraging conditions, the youngest birds generally do not survive.

The young fledge in approximately eight weeks but will stay at the nest for three to four more weeks to be fed. Adults feed the young by regurgitating whole fish into the bottom of the nest about three to ten times per day. Feedings are more frequent when the birds are young (Coulter et al. 1999). When wood storks are forced to fly great distances to locate food, feedings are less frequent (Bryan et al. 1995). The total nesting period from courtship and nest-building through independence of young, lasts approximately 100 to 120 days (Coulter et al. 1999). Within a colony, nest initiation may be asynchronous, and consequently, a colony may contain active breeding wood storks for a period significantly longer than the 120 days required for a pair to raise young to independence. Adults and independent young may continue to forage around the colony site for a relatively short period following the completion of breeding. Appropriate water depths for successful foraging are particularly important for newly fledged juveniles (Borkhataria et al. 2008).

Receding water levels are necessary in south Florida to concentrate suitable densities of forage fish (Kahl 1964, Kushlan et al. 1975) to sustain successful wood stork nesting. During the period when a nesting colony is active, wood storks are dependent on consistent foraging opportunities in wetlands within their core foraging area (30 kilometer radius, USFWS 2010) surrounding a nest site. The greatest energy demands occur during the middle of the nestling period, when nestlings are 23 to 45 days old (Kahl 1964). The average wood stork family requires 201 kilograms (443 pounds) of fish during the breeding season, with 50 percent of the nestling stork's food requirement occurring during the middle third of the nestling period (Kahl 1964). Although the short hydroperiod wetlands support fewer fish and lower fish biomass per unit area than long hydroperiod wetlands, these short hydroperiod wetlands were historically more extensive and provided foraging areas for wood storks during colony establishment, courtship and nest-building, egg-laying, incubation, and the early stages of nestling provisioning.

The annual climatological pattern that appears to stimulate the heaviest nesting efforts by wood storks is a combination of the average or above-average rainfall during the summer rainy season prior to colony formation and an absence of unusually rainy or cold weather during the following winter-spring nesting season. This pattern produces widespread and prolonged flooding of summer marshes that maximizes production of freshwater fishes, followed by steady drying that concentrates fish during the dry season when storks nest (Kahl 1964, Frederick et al. 2009). However, frequent heavy rains during nesting can cause water levels to increase rapidly. The abrupt increases in water levels during nesting, termed reversals (Crozier and Gawlik 2004), may cause nest abandonment, re-nesting, late nest initiation, and poor fledging success. Abandonment and poor fledging success was reported to have affected most wading bird colonies in southern Florida during 2004, 2005 and 2008 (Crozier and Cook 2004, Cook and Call 2005, SFWMD 2008).

Following the completion of the nesting season, both adult and fledgling wood storks generally begin to disperse away from the nesting colony. Fledglings have relatively high mortality rates within the first six months following fledging, most likely as a result of their lack of experience, including the selection of poor foraging locations (Hylton et al. 2006, Borkhataria et al. 2008). Post-fledging survival also appears to be variable among years, probably reflecting the environmental variability that affects wood storks and their ability to forage (Hylton et al. 2006, Borkhataria et al. 2008).

The original Everglades ecosystem, including the WCAs, provided abundant primary and secondary wading bird production during the summer and fall months (Holling et al. 1994). This productivity was concentrated during the dry season when water levels receded. The concentrations of food provided ideal foraging habitat for numerous wetlands species, especially large flocks of wading birds (Bancroft 1989, Ogden 1994). However, the hydrology of the Everglades ecosystem and WCA 3A has been severely altered by extensive drainage and the construction of canals and levees (Abbott and Nath 1996). The resulting system is not only spatially smaller, but also drier than historical levels (Walters et al. 1992). Breeding populations of wading birds have responded negatively to the altered hydrology (Ogden 1994, Kushlan and Fohring 1986, Bancroft 1989).

Wood stork colonies exist directly adjacent to Tamiami Trail and within NESRS. Tamiami Trail East 1 (TT-East), TT-East 2, TT-West, and Grossman's Ridge West all occur within the main action area (**FIGURE 12**). The field test is an operational plan that is expected to benefit ENP by increasing flows to NESRS. By reducing limitations on S-333, potentially more water will be delivered to NESRS, rehydrating historic wetlands. During the field test, the stage elevation experienced at G-3273 and other locations within NESRS are expected to be similar to the intra-annual range of water stages experienced under recent C&SF Project operations. The duration at which water stages at G-3273 exceed 6.8 feet NGVD is expected to increase. The Proposed Action is expected to increase the number of unconstrained discharges from WCA 3A to NESRS by up to 1,176 days, a 64% increase relative to the No Action Alternative. A potential increase in hydroperiods within NESRS may provide an overall net benefit for wood stork foraging suitability by maximizing production of freshwater fishes. Monitoring of optimal foraging depths and recession rates for this species is being proposed as part of the field test, (reference **Appendix C**). Since the foraging radius of TT-East 1, TT-East 2, TT-West and Grossman's Ridge West includes parts of WCA 3A, WCA 3B, ENP, and the Pennsuco Wetlands, sufficient foraging opportunities are anticipated to remain in other areas to offset any poor foraging conditions that may result from the field test; however, it is not anticipated that such conditions would occur. Potential reductions in wood stork foraging conditions and colony abandonment due to artificial reversals at the end of the dry season/start of the wet season is also not anticipated as a result of field test implementation. Historically, wood stork nesting started around November-December, but in recent decades it has shifted to January-March. Additional water being delivered to NESRS is also only expected to occur during the wet season when areas are already anticipated to be inundated. Potential increases are expected to occur during the wet season. Based on this information and the limited duration of the field test, the Corps has determined that implementation of the Proposed Action may affect but is not likely to adversely affect this species. The Corps will continue to implement Periodic Scientist Calls as outlined within the 2011 ERTP Final EIS and will include assessment of conditions within the project

area to ensure wildlife recommendations are considered during the water management decision process.

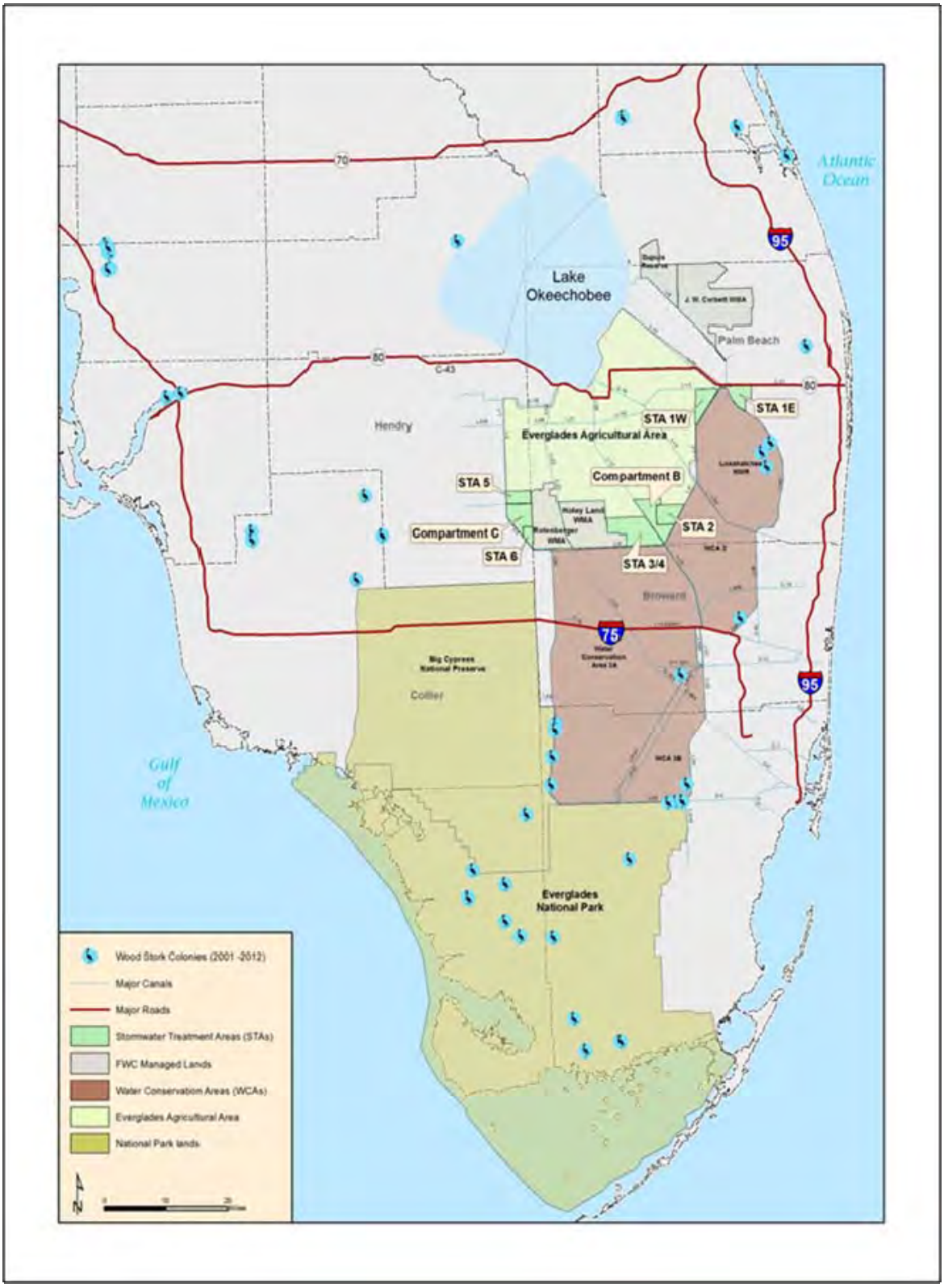

FIGURE 12. LOCATION OF WOODSTORK COLONIES IN SOUTH FLORIDA BETWEEN 2001 AND 2012

6.10 American Alligator and "No Effect Determination"

The American alligator is listed as threatened by the USFWS due to similarity of appearance to the American crocodile, an endangered species. A keystone species within the Everglades ecosystem, the American alligator is dependent on spatial and temporal patterns of water fluctuations that affect courtship and mating, nesting, and habitat use (Brandt and Mazzotti 2000). Historically, American alligators were most abundant in the peripheral Everglades marshes and freshwater mangrove habitats, but are now most abundant in canals and the deeper slough habitats of the central Everglades. Water management practices including drainage of peripheral wetlands and increasing salinity in mangrove wetlands as a result of decreased freshwater flows has limited occurrence of American alligators in these habitats (Craighead 1968, Mazzotti and Brandt 1994). Increased water deliveries to ENP may beneficially affect American alligator habitat. During the field test, the stage levels experienced at G-3273 and other locations within NESRS are expected to be similar to the intra-annual range of water stages experienced under recent C&SF Project operations. The duration at which water stages at G-3273 exceed 6.8 feet NGVD is expected to increase. Elimination or modification of American alligator habitat is not expected under the field test. The Corps has determined that there would be no effect on this species from the implementation of the Proposed Action.

6.11 American Crocodile and Critical Habitat and "No Effect Determination"

American crocodiles are known to exist throughout the project area, specifically around the coastal fringes from Miami to the bottom of the peninsula and up around Naples (Cherkiss 1999). The cooling canals of Florida Power and Light's Turkey Point Power Plant support the most successful crocodile nesting population in south Florida (Mazzotti et al. 2007). These cooling canals offer premium nesting habitat because they satisfy the crocodile's two primary nesting requirements – suitable substrate above the normal high water level and adjacent deep-water refugia. While crocodiles prefer sandy substrates, they will often utilize canal spoil banks (Kushlan and Mazzotti 1989). The ideal salinity range for American crocodiles is 0 to 20 psu (Moler 1992, Mazzotti 1999, Mazzotti et al. 2007).

The American crocodile's critical habitat includes all land and water within the following boundary: beginning at the easternmost tip of Turkey Point, Dade County, on the coast of Biscayne Bay; then southeastward along a straight line to Christmas Point at the southernmost tip of Elliott Key; then southwestward along a line following the shores of the Atlantic Ocean side of Old Rhodes Key, Palo Alto Key, Anglefish Key, Key Largo, Plantation Key, Windley Key, Upper Matecumbe Key, Lower Matecumbe Key, and Long Key; then to the westernmost tip of Middle Cape; then northward along the shore of the Gulf of Mexico to the north side of the mouth of Little Sable Creek; then eastward along a straight line to the northernmost point of Nine-Mile Pond; then northeastward along a straight line to the point of beginning (**FIGURE 13**).

Under the Proposed Action, the frequency of S-197 discharges potentially increase from 14 days to a range of 39 to 82 days and the volume of S-197 discharges potentially increases between 20,000 to 30,000 acre-feet, an increase of 11-67% relative to the current WCAs-ENP-ENP to SDCS Water Control Plan (USACE 2012c). Potential increases in the frequency of S-197 discharges, under the Proposed Action are expected to occur primarily during the wet season (June-November).

Nearshore salinity conditions within the coastal estuaries are elevated much of the year as a result of the less than adequate freshwater flow deliveries. Overland flow of freshwater into coastal estuaries is preferred as compared with point source discharges through the S-197 structure, however; low volume releases to Manatee Bay and Barnes Sound through this structure are considered preferential to high volume releases which result in increased incidence of large salinity swings as well as high nutrient load delivery. Manatee Bay and Barnes Sound are relatively large bodies of water with open connections to Card Sound and the Atlantic Ocean. Waters within Manatee Bay and Barnes Sound have been documented to have shorter residence times relative to northeastern Florida Bay (Marshall 2014). In addition, these areas experience greater flushing relative to northeastern Florida Bay. Potential salinity fluctuations due to implementation of the Proposed Action would be temporary and spatially limited to nearshore areas. Most crocodiles within this area have been observed near Card Sound Road, the southeast corner of Florida Power and Light Company's Turkey Point Power Plant, and the Crocodile Lake National Wildlife Refuge on the Key Largo shore of Barnes Sound. Fewer crocodiles have been observed near the S-197 structure (Cherkiss et al. 2011). Low volume releases at S-197 has the potential to decrease flows to Taylor Slough, and subsequently Florida Bay. Currently, water which discharges from S-18C (**FIGURE 7**), is allowed to flow over the scraped down canal banks into ENP's Eastern Panhandle towards the tidal creeks feeding into Long Sound and Joe Bay.

Based on the above information and the fact that Increment 1 includes a robust monitoring plan, the Corps has determined that there would be no effect on the American crocodile and its designated critical habitat from implementation of the Proposed Action. The Corps will monitor existing salinity gages in Joe Bay, Long Sound, Manatee Bay, and Barnes Sound throughout the duration of the field test (**Appendix C**). In addition, the Corps will continue to implement Periodic Scientist Calls as outlined within the 2011 ERTP Final EIS and will include assessment of conditions within the southern estuaries.

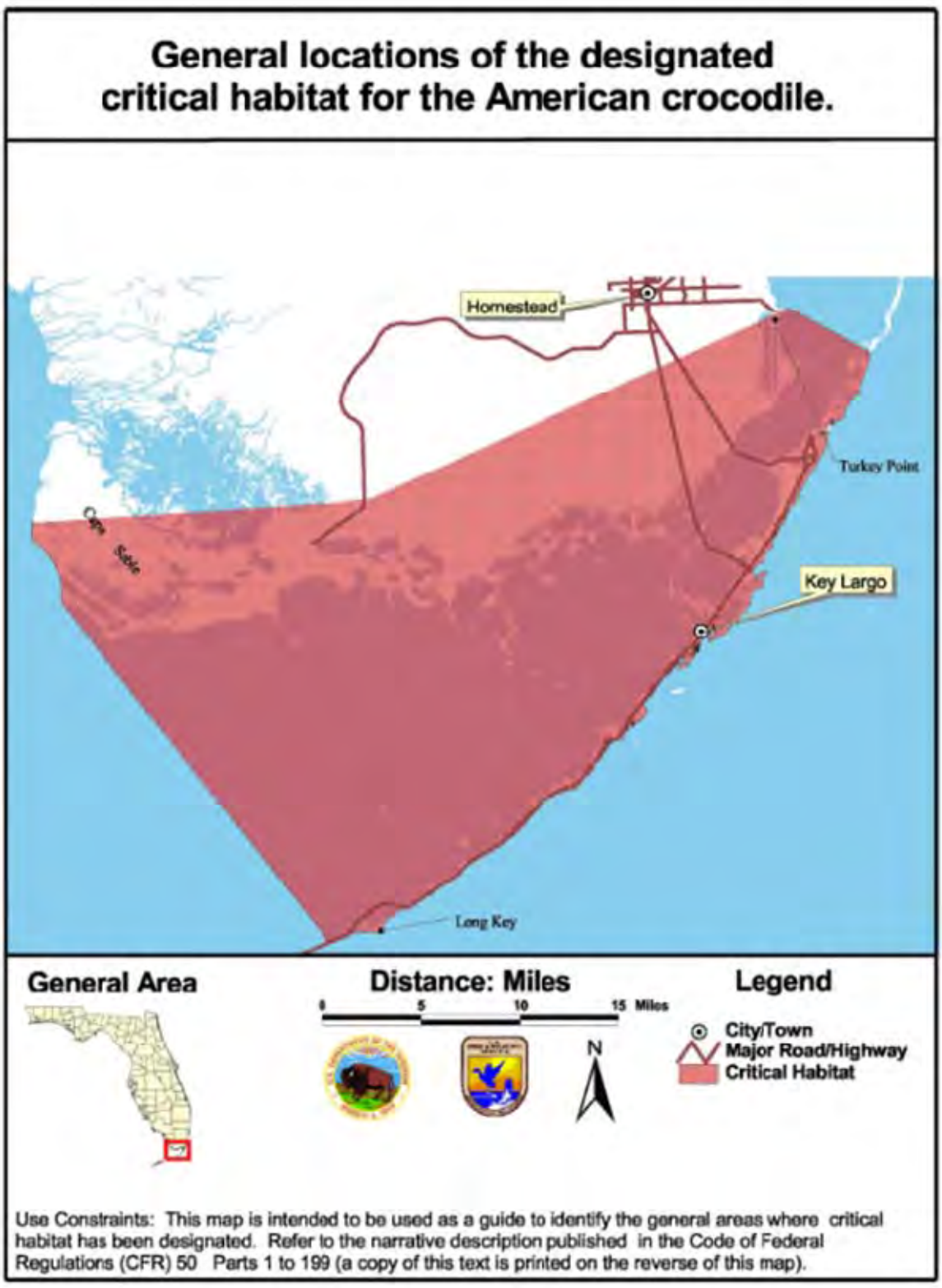

FIGURE 13. AMERICAN CROCODILE CRITICAL HABITAT

6.12 Eastern Indigo Snake and "No Effect 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. Observations over the last 50 years made by maintenance workers in citrus groves in east-central Florida indicate that eastern indigo snakes are most frequently observed near the canals, roads, and wet ditches (USFWS 2013). It is anticipated that eastern indigo snakes would be present in sugarcane fields since one of their prey species; the King snake (*Lampropeltis getula floridanus*) has been previously documented in sugarcane fields (Krysko 2002, USFWS 2013). Eastern indigo snakes need relatively large areas of undeveloped land to maintain their population. In general, adult males have larger home ranges than females or juveniles. In Florida, Smith (2003) indicated that female and male home ranges extend from 5 to 371 acres and 4 to 805 acres, respectively.

In south Florida, the Eastern indigo snake is thought to be widely distributed. Given their preference for upland habitats (Steiner et al. 1983), Eastern indigo snakes are not commonly found in great numbers in the wetland complexes of the Everglades region, even though they may be found in pinelands, tropical hardwood hammocks, and mangrove forests in extreme south Florida (Duellman and Schwartz 1958, Steiner et al. 1983). They prefer dry, well drained sandy soils, and commonly use burrows and other natural holes as dens. Steiner et al. (1983) also reported that Eastern indigo snakes inhabit abandoned agricultural land and human-altered habitats in south Florida which would include levees within the WCAs. The field test is an operational plan that is expected to benefit ENP by increasing flows to NESRS. The field test is not expected to have significant effects on the upland habitats preferred by this species. No construction is proposed. The Corps has determined that there would be no effect on this species from the implementation of the Proposed Action.

6.13 Miami Blue Butterfly and "No Effect Determination"

The Miami blue is a small butterfly endemic to Florida. The Miami blue has a forewing length of 10 to 13 millimeters. Males and females are both bright blue dorsally, but females have an orange eyespot near their hind wing. Both sexes have a gray underside with four black spots. The Miami blue butterfly occurs at the edges of tropical hardwood hammocks, beachside scrub, and occasionally in rockland pine forests. Larval host plants include the seed pods of nickerbeans (*Caesalpinia spp.*), blackbeards (*Pithecellobium spp.*), and balloon vine

(*Cardiospermum halicababum*), a non-native species. Adults feed on the nectar of Spanish needles (*Bidens pilosa*), cat tongue (*Melanthera aspera*), and other weedy flowers near disturbed hammocks. Primarily a south Florida coastal species, the Miami blue's historic distribution ranged as far north as Hillsborough County on the Gulf Coast and Volusia County on the Atlantic Coast and extended south to the Florida Keys and the Dry Tortugas (FWC 2013). The butterfly was thought to be extinct following Hurricane Andrew in 1992, but was observed in November 1999 at Bahia Honda State Park in the Florida Keys. More than 329 surveys conducted at locations in mainland Florida and the Keys have failed to detect other colonies of this species. The Corps has determined that the Proposed Action would have no effect on the Miami blue Butterfly.

6.14 Schaus Swallowtail Butterfly and "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 preferred subtropical hardwood hammock habitat in the main action area, the Corps has determined that the Proposed Action would have no effect on the Schaus swallowtail butterfly.

6.15 Stock Island Tree Snail and "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 main action area, the Corps has determined that the Proposed Action would have no effect on this species.

6.16 Crenulate Lead Plant and "No Effect Determination"

A perennial, deciduous shrub, the crenulate lead-plant is endemic to Miami-Dade County. Agricultural, urban and commercial development within Miami-Dade County have destroyed approximately 98-99% of the pine rockland communities where this species occurred, prompting the USFWS to list the crenulate lead-plant as endangered in 1985 (USFWS 1999). Other threats to the continued existence of this species include fire suppression, drainage and exotic plant invasion. Its present distribution is restricted to eight known locations within a 20-square mile area from Coral Gables to Kendall, Miami-Dade County. Four of the known sites are within public parks managed by the Miami-Dade County Parks Department (USFWS 1999). As the

crenulate lead-plant is not known to occur within WCA 3A or ENP, the Corps has determined that the Proposed Action will have no effect on this species.

6.17 Deltoid Spurge, Garber's Spurge, Small's Milkpea, Tiny Polygala and "May Affect Not Likely to Adversely Affect Determination"

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

Within the project area, pine rocklands occur on the Miami Rock Ridge and extend into the Everglades as Long Pine Key. These listed plant species have the potential to occur within the rocky glades surrounding the Frog Pond Detention Area. Under the field test, there are no proposed changes to the operations of the C-111 South Dade Detention Area. Field test water management operations may result in increased seepage to the L-31N Canal south of the S-331 pump station, prior to the construction and operation of the C-111 South Dade Project NDA. The additional volume of seepage to the L-31N Canal is expected to be primarily managed with the C-111 South Detention Area using S-332 B, S-332C, and S-332D, given the significant reduction in WCA 3A regulatory releases to the SDCS. The Corps has determined that the implementation of the Proposed Action may affect, but is not likely to adversely affect, these species.

6.18 Okeechobee Gourd and "No Effect Determination"

The Okeechobee gourd is a climbing annual or perennial vine. The cream-colored flowers are bell-shaped and the light green gourd is globular or slightly oblong. The Okeechobee gourd was locally common in the extensive pond apple forest that once grew south of Lake Okeechobee. Historically, the Okeechobee gourd was found on the southern shore of Lake Okeechobee in Palm Beach County and in the Everglades. Currently this species is limited to two disjunct populations, one along the St. Johns River in Volusia, Seminole, and Lake Counties in northern Florida and a second around the shoreline of Lake Okeechobee in south Florida (USFWS 1999). The conversion of the pond apple forested swamps and marshes for agricultural purposes as well as water-level regulation within Lake Okeechobee have been the principal causes of the reduction in both range and number of the Okeechobee gourd. As the Okeechobee gourd is not known to occur within WCA 3A or ENP, the Corps has determined that the Proposed Action will have no effect on this species.

6.19 Cape Sable Thoroughwort and Critical Habitat and "No Effect Determination"

The Cape Sable thoroughwort is endemic to south Florida, and is a flowering perennial herb that is 8-40 inches tall. The Cape Sable thoroughwort was historically known from Monroe County, both on the Florida mainland and the Florida Keys, and in Miami-Dade County along Florida Bay. The current range of the species includes areas in ENP and five islands in the Florida Keys.

It occurs throughout coastal rock barrens and berms and sunny edges of rockland hammock. The decline of the species is primarily the result of habitat loss from commercial and residential development, sea level rise, storms, competition from non-native plants, predation by non-native herbivores, and wildfires. Critical habitat for the species occurs in nine separate units across approximately 10,968 acres of Miami-Dade and Monroe Counties. The nine units are: 1) ENP, 2) Key Largo, 3) Upper Matecumbe Key, 4) Lignumvitae Key, 5) Lower Matecumbe Key, 6) Long Key, 7) Big Pine Key, 8) Big Munson Island, and 9) Boca Grande Key. Seven of the nine units are currently occupied by the plant. The field test is not expected to affect coastal rock barrens; therefore, the Corps has determined that the Proposed Action will have no effect on this species or its designated critical habitat.

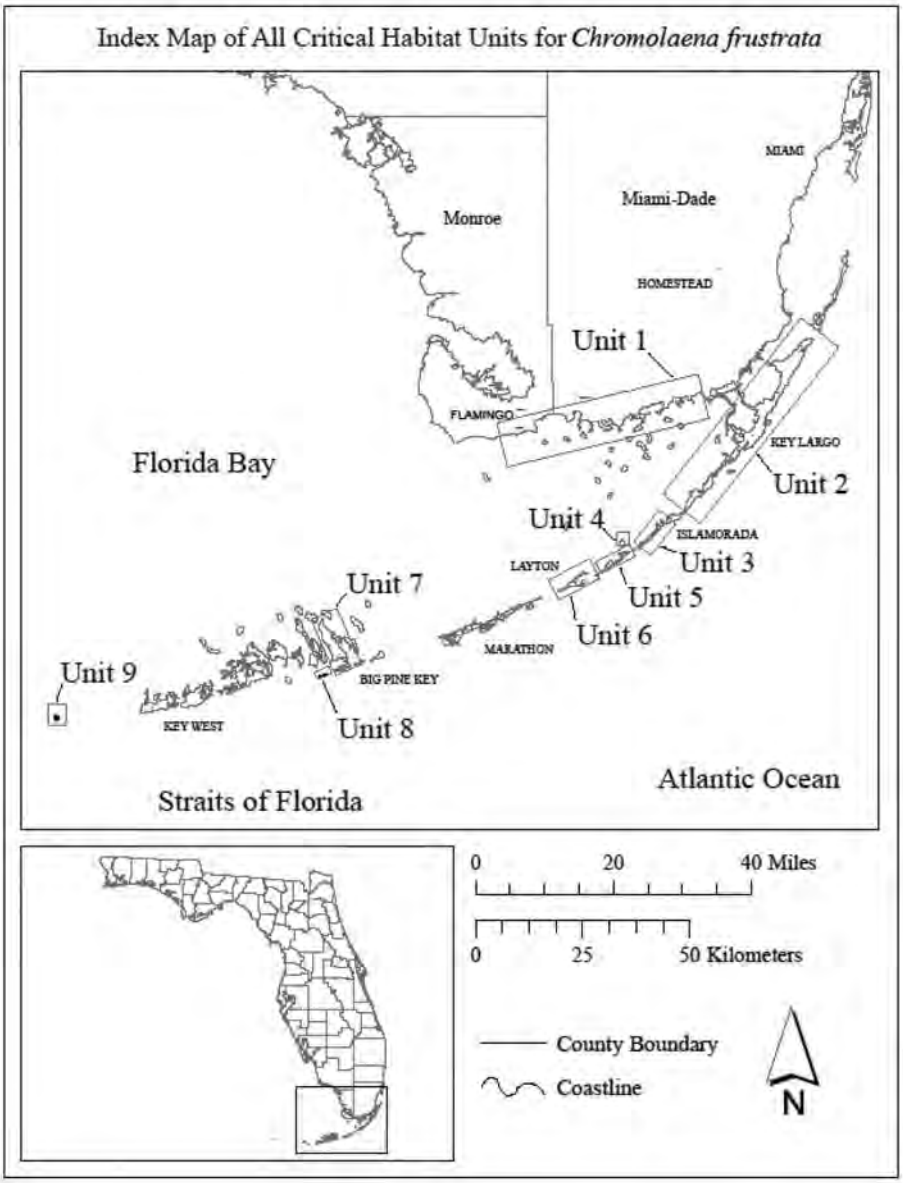

FIGURE 14. CAPE SABLE THOROUGHWORT CRITICAL HABITAT

6.20 Carters Small-Flowered Flax and Florida Brickell-Bush and "No Effect Determination"

Carter's small-flowered flax and Florida brickell-bush are endemic to the pine rocklands of the Miami Rock Ridge in Miami-Dade County. Both species grow exclusively on the Miami Rock Ridge outside the boundaries of ENP (79 FR 52567; September 4, 204). Carter's small-flowered flax is an annual or short-lived perennial herb and was first collected between coconut Grove and Cutler areas of Miami. It is currently found from R. Hardy Matheson Preserve southwest to Naranja/Modello, with a distance of approximately 27.3 km between the farthest locations.

Florida brickell-bush is a perennial herb and was known to historically occur from central and southern Miami-Dade County from approximately Coconut Grove to Florida City, although the full extent of its historical range is unknown. Florida brickell-bush is currently distributed from central and southern Miami-Dade County from SW 120 Street to Florida City. Little research has been done into the demography, reproductive biology, or genetics of the species.

Field observations indicate the species does not usually occur in great abundance. Populations are typically sparse and contain a low density of plants even in well-maintained pine rockland habitat. Carter's small-flowered flax and Florida brickell-bush have experienced substantial destruction, modification, and curtailment of their habitat and range. Specific treats to these plants include habitat loss, fragmentation, and modification cause by development (i.e. conversion to both urban and agricultural land uses) and inadequate fire management. Only small and fragmented occurrences of these two plants remain. The current ranges span such a small geographic area – a narrow band no more than 4.0 km in width, and approximately 30.1 km in length, respectively, along the Miami Rock Ridge.

Within the project area, pine rocklands occur on the Miami Rock Ridge and extend into the Everglades as Long Pine Key. Although potentially suitable habitat exists within the action area, the Corps has determined that the implementation of the Proposed Action will have no effect on these species due to the lack of anticipated changes in hydrology within pine rockland habitat.

6.21 Florida Bristle Fern and "No Effect Determination"

The Florida bristle fern is very small in size and superficially resembles other bryophytes, such as mosses and liverworts, making it difficult to observe in its natural habitat. It is mat forming, has no roots, and contains trichomes (hairlike/bristelike outgrowth) on the tip of the fern. In southeastern North America, *Trichomanes spp.* Are considered rare because of their delicate nature and requirements for deeply sheltered habitats with almost continuous high moisture and humidity (Farrar 1993b, Zots and Buche 2000). In Florida, the sub-species is only known to occur in Miami-Dade and Sumter Counties. In Miami-Dade County, the Florida bristle-fern is generally epiphytic (a plant that grows non-parasitically upon another plant) or epipetric (growing on rocks), typically growing in rocky outcrops of rockland hammocks, in oolitic limestone solution holes, and, occasionally, on tree roots in limestone surrounded areas (Philips 1940, Nauman 1986, Whitney *et al. 2004, Possley 2013f, Van der Heiden 2014b).* In Miami-Dade, the historical range of the subspecies extended from Royal Palm Hammock (now in ENP) at its southern limit, northeast to Snapper Creek Hammock, which is located in R. Hardy Matheson Preserve. The four populations that constitute the Miami Dade County metapopulation are located in urban preserves managed by the County's Environmentally

Endangered Lands Program and include Castellow Hammock Park, Hattie Bauer Hammock, Fuchs Hammock Preserve, and Meissner Hammock. Factors affecting the sub-species include habitat modification and destruction caused by human population growth and development.
Within the project area, pine rocklands occur on the Miami Rock Ridge and extend into the Everglades as Long Pine Key. Although potentially suitable habitat exists within the action area, the Corps has determined that the implementation of the Proposed Action will have no effect on the sub-species. Systematic surveys completed in ENP over the years have not been able to find the Florida bristle fern (79 FR 61148; October 9, 2014).

6.22 Florida Semaphore Cactus and "No Effect Determination"

The Florida semaphore cactus is a prickly pear cactus endemic to the Florida Keys. Plants can grow to tree like form with flattened branches, red flowers, and many long spines. Historically, the Florida semaphore cactus was known from Key Largo and Big Pine Key (Barnhardt 1935), but development has destroyed these populations. The only "wild' population remaining is located in a Nature Conservancy preserve in the middle Keys. Several out plantings by Fairchild Tropical Garden and the University of South Florida were made in the late 1990s. Fairchild Tropical Gardens planted less than 200 cacti on Key Largo and Big Pine Key, the majority of which have died. The University of South Florida planted 240 cacti on Big Pine Key, Upper Sugarloaf Key, No Name Key, Little Torch Key, Ramrod Key, and Cudjoe Key. At least 3/4 of cacti planted by the University of Florida have been lost to damage from the introduced exotic cactus moths (Lippencott 1990). Threats to the species include habitat destruction due to development, collection of the species by cactus enthusiasts, introduction of the exotic cactus moth (*Cactoblastis cactorum*), salt water intrusion, lack of genetic diversity, and pathogens. The Corps has determined that the Proposed Action will have no effect on this species.

7.0 EFFORTS TO ELIMINATE POTENTIAL IMPACTS ON LISTED SPECIES

The Corps commits to avoiding, minimizing or mitigating for adverse effects. All practicable means to avoid or minimize environmental effects were incorporated into the Proposed Action. A monitoring plan has been developed for the field test and has been included in **Appendix C**. In addition to the monitoring outlined within **Appendix C**, the Corps and South Florida Water Management District (SFWMD) will continue existing hydrologic and species monitoring plans to ensure that the Incidental Take as defined within the USFWS 2009 C-111 Western Spreader Canal Project BO and the 2010 ERTP BO is not exceeded. In February 2012, the SFWMD completed construction of the C-111 Western Spreader Canal Project as part of its state-expedited program. The SFWMD currently conducts an annual assessment of the project in accordance with Corps permit reporting guidelines (Department of Army Permit SAJ-2005-9856 [IP-AAZ]) and the USFWS 2009 BO (http://www.fws.gov/verobeach/verobeach_olddont_delete/sBiologicalOpinion/index.cfm?method=biologicalopinion.search). Annual reporting is summarized in the South Florida Environmental Report. In accordance with the Terms and Conditions within the USFWS 2010 ERTP BO, the Corps is required to provide an annual assessment of ERTP operations. The annual assessment includes a summary of Periodic Scientist Calls, analysis of incidental take, analysis of ERTP performance measures, and ecological targets and species monitoring. The Incidental Take Statements, Terms and Conditions and Reinitiation Notice are defined in the 2010 ERTP BO (http://www.evergladesplan.org/pm/program_docs/ertp.aspx). The Corps will

continue to maintain ongoing communications with the USFWS throughout the duration of the field test.

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9.0 LIST OF PREPARERS

Name	Affiliation	Qualification/Role
Melissa Nasuti	USACE	Biologist – Preparation
Gina Ralph	USACE	Biologist - Reviewer

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DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

AUG 2 2 2014

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

Dear Mr. Williams,

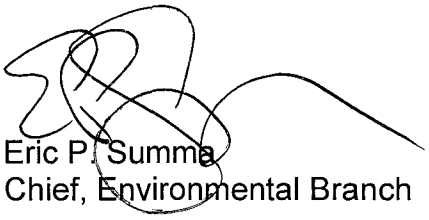
The Jacksonville District, U.S. Army Corps of Engineers (Corps) is beginning preparation of a Draft Environmental Assessment for an operations field test that will include relaxation of the Gage-3273 (G-3273) constraint and operation of water control structures S-356 and S-357 N (Figure 1). The purpose of this field test is to evaluate raising or removing the existing G-3273 stage constraint to enable increased water deliveries from Water Conservation Area 3A (WCA 3A) to Everglades National Park through Northeast Shark River Slough for the benefit of natural resources. The field test is the first in a series of sequential efforts that are intended to incorporate constructed features of the Modified Water Deliveries (MWD) to ENP and Canal 111 South Dade projects into system-wide Central and Southern Florida (C&SF) Project operations.

The C&SF system-wide project is located in South Florida and includes portions of several counties as well as portions of ENP, Big Cypress National Preserve, and adjacent areas. The 1992 MWD General Design Memorandum defines the project boundary as Shark River Slough and that portion of the C&SF Project north of S-331 to include WCA 3. G-3273 lies within eastern ENP, directly west of 8.5 Square Mile Area (Figure 1).

Pursuant to the Endangered Species Act, as amended, the Corps is requesting written confirmation of species or their critical habitat either listed or proposed for listing that may be present within the referenced project area within 30 days upon receipt of this letter. The Corps has tentatively determined that the following list of threatened and endangered species may be present within the project area as illustrated in Tables 1 and 2.

If you have any questions, or need further information, please contact Melissa Nasuti by email melissa.a.nasuti@usace.army.mil or telephone 904-232-1368. Thank you for your assistance in this matter.

Sincerely,



Eric P. Summa
Chief, Environmental Branch

Enclosures

Copy Furnished:
Mr. Kevin Palmer, U.S. Fish and Wildlife Service, 1339 20th Street, Vero Beach, Florida 32960

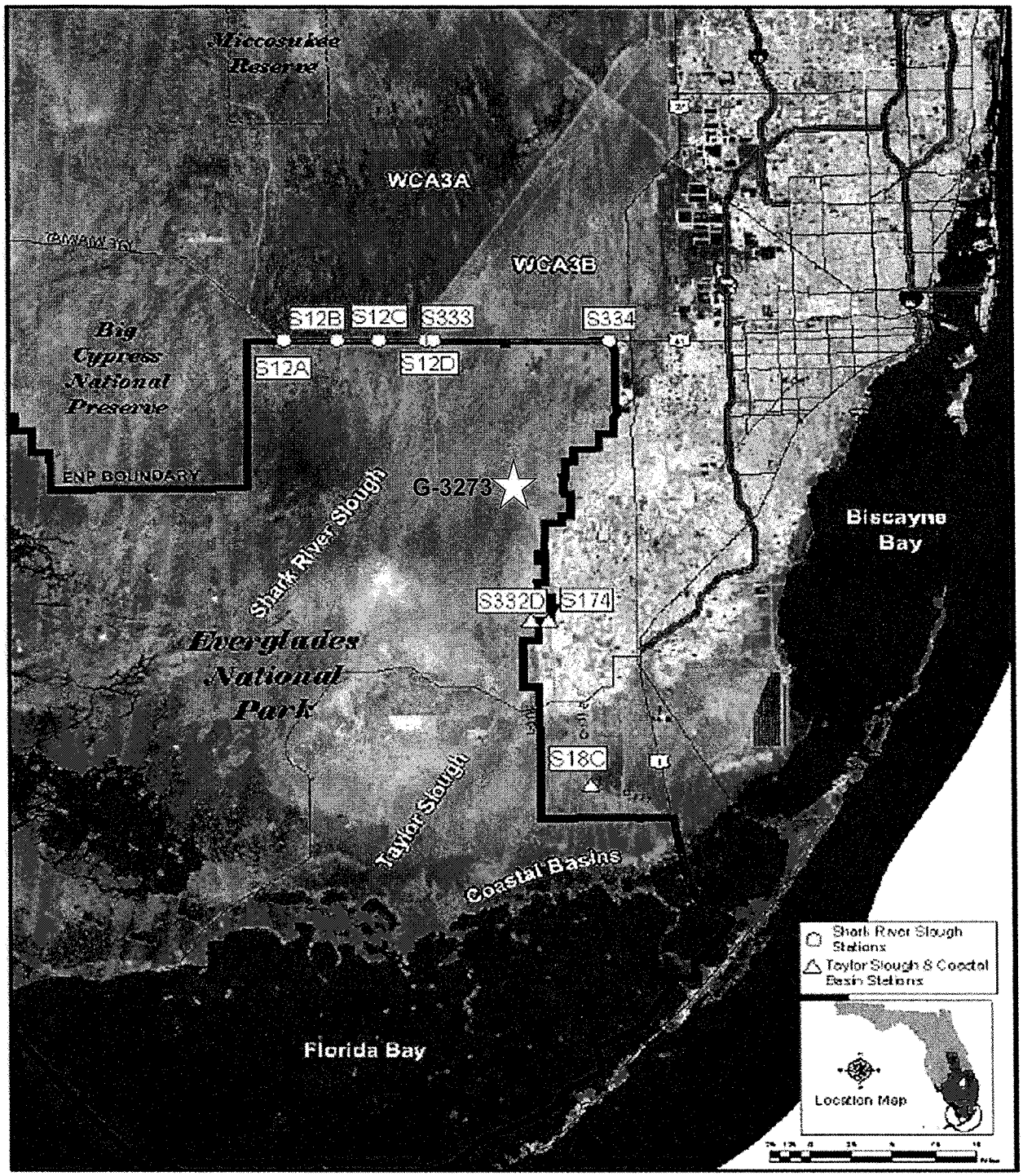


Figure 1. Project Area

Table 1. List of Federally Threatened and Endangered Species within the project area (E: Endangered, T: Threatened, SA: Similarity of Appearance, CH: Critical Habitat, C: Candidate Species)

Common Name	Scientific Name	Status
Mammals		
Florida panther	*Puma concolor coryi*	E
West Indian Manatee	*Trichechus manatus*	E, CH
Florida bonneted bat	*Eumops floridamus*	E
Birds		
Cape Sable seaside sparrow	*Ammodramus maritimus mirabilis*	E, CH
Everglade snail kite	*Rostrhamus sociabilis plumbeus*	E, CH
Red-cockaded woodpecker	*Picoides borealis*	E
Roseate tern	*Sterna dougallii dougallii*	T
Wood stork	*Mycteria americana*	E
Reptiles		
American Alligator	*Alligator mississippiensis*	T, SA
American crocodile	*Crocodylus acutus*	T, CH
Eastern indigo snake	*Drymarchon corais couperi*	T
Green sea turtle*	*Chelonia mydas*	E
Hawksbill sea turtle*	*Eretmochelys imbricate*	E
Kemp's Ridley sea turtle*	*Lipodochelys kempii*	E
Leatherback sea turtle*	*Dermochelys coriacea*	E
Loggerhead sea turtle*	*Caretta caretta*	E
Fish		
Smalltooth sawfish*	*Pristia pectinata*	E, CH
Invertebrates		
Schaus swallowtail butterfly	*Heraclides aristodemus ponceanus*	E
Stock Island tree snail	*Orthalicus reses* (not incl. *nesodryas*)	T
Miami blue butterfly	*Cyclargus thomasi bethunebakeri*	E
Bartram's hairstreak butterfly	*Strymon acis bartrami*	C
Florida leafwing butterfly	*Anaea troglodyta floridalis*	C
Plants		
Crenulate lead plant	*Amorpha crenulata*	E
Deltoid spurge	*Chamaesyce deltoidea* spp. *deltoidea*	E
Garber's spurge	*Chamaesyce garberi*	T
Okeechobee gourd	*Cucurbita okeechobeensis* ssp. *okeechobeenis*	E

Small's milkpea	*Galactia smallii*	E
Tiny polygala	*Polygala smallii*	E
Big pine partridge pea	*Chamaecrista* var. *keyensis*	C
Blodgett's silverbush	*Argythamnia blodgettii*	C
Cape Sable thoroughwort	*Chromolaena frustrata*	C
Carter's small-flowered flax	*Linum carteri* var. *carteri*	C
Everglades bully	*Sideroxylon reclinatum* spp. *austrofloridense*	C
Florida brickell-bush	*Brickellia mosieri*	C
Florida bristle fern	*Trichomanes punctatum* spp. *Floridanum*	C
Florida pineland crabgrass	*Digitaria pauciflora*	C
Florida prairie-clover	*Dalea carthagenensis* var. *floridana*	C
Florida semaphore cactus	*Consolea corallicola*	C
Pineland sandmat	*Chamaesyce deltoidea* spp. *pinetorum*	C
Sand flax	*Linum arenicola*	C

* Marine species under the purview of National Marine Fisheries Service (NMFS), the Corps will conduct a separate consultation with NMFS

Table 2. List of State Listed Species within the project area (E: Endangered, T: Threatened, SC: Species of Special Concern)

Common Name	Scientific Name	Status
Mammals		
Florida black bear	*Ursus americanus floridanus*	T
Everglades mink	*Mustela vison evergladensis*	T
Florida mouse	*Podomys floridanus*	SC
Florida mastiff bat	*Eumops glaucinus floridanus*	E
Birds		
Piping plover	*Charadrius melodus*	T
Snowy plover	*Charadrius alexandrinus*	T
American oystercatcher	*Haematopus palliates*	E
Brown pelican	*Pelecanus occidentalis*	SC
Black skimmer	*Rynchops niger*	SC
Least tern	*Sterna antillarium*	T
White-crowned pigeon	*Columba leucocephalus*	T
Least tern	*Sterna antillarum*	T
Limpkin	*Aramus guarauna*	SC
Little blue heron	*Egretta caerulea*	SC
Tricolored heron	*Egretta tricolor*	SC
Snowy egret	*Egretta thula*	SC
Reddish egret	*Egretta rufescens*	SC
White ibis	*Eudocimus albus*	SC
Roseate spoonbill	*Ajaja ajaja*	SC
Fish		
Mangrove rivulus	*Rivulus marmoratus*	SC
Invertebrates		
Miami blue butterfly	*Cyclargus [=Hermiargus] thomasi bethunebakeri*	E
Florida tree snail	*Liguus fasciatus*	SC
Plants		
Pine-pink orchid	*Bletia purpurea*	T
Lattace vein fern	*Thelypteris reticulate*	E
Eatons spikemoss	*Selaginella eatonii*	E
Wright's flowering fern	*Anemia wrightii*	E
Tropical fern	*Schizaea pennula*	E
Mexican vanilla	*Manilla mexicana*	E

United States Department of the Interior

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

September 11, 2014

Eric Summa
Chief, Environmental Branch
U.S. Army Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232

Service Activity Code: 04EF2000-2014-CPA-0183
Date Received: August 26, 2014
Project: G-3273 / S-356 Test
County: Miami-Dade

Dear Mr. Summa:

The U.S. Fish and Wildlife Service (Service) has reviewed the U.S. Army Corps of Engineers' (Corp) letter dated August 22, 2014, requesting confirmation of federally-listed species or their designated critical habitat and candidate species for listing that may be present within the G-3273 / S-356 Test Project area. The species list is a National Environmental Policy Act (42 U.S. Code (USC) § 4321) requirement for the environmental analysis. This species list is also provided in accordance with the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*). The project area lies entirely within Miami-Dade County, Florida; however, manipulation of current operating procedures may affect Water Conservation Areas 3A, 3B, Northeast Shark River Slough in Everglades National Park, and the lower C-111 South Dade Conveyance System including Manatee Bay.

The Service has reviewed our Geographic Information System (GIS) database and other information for recorded locations of federally-listed threatened and endangered species and critical habitats on or adjacent to the project site. The GIS database is a compilation of data received from several sources. The G-3273 / S-356 Test Project occurs mainly in wetland habitats in the planning area, however, effects of the proposed project could reach into adjacent habitats as well. State-listed species and those proposed for Federal listing are included due to the projected life of the proposed project. The following tables list species with both Federal (Table 1) and State (Table 2) status that should be considered in the planning process for the G-3273 / S-356 Test Project.

Table 1. List of federally Threatened and Endangered Species within the project area (E: Endangered, T: Threatened, SA: Similarity of Appearance, CH: Critical Habitat, C: Candidate Species).

Common Name	Scientific Name	Status
Mammals		
Florida panther	*Puma concolor coryi*	E
Florida manatee	*Trichechus manatus latirostris*	E, CH
Florida bonneted bat	*Eumops floridanus*	E
Birds		
Cape Sable seaside sparrow	*Ammodramus maritimus mirabilis*	E, CH
Everglade snail kite	*Rostrhamus sociabilis plumbeus*	E, CH
Piping plover	*Charadrius melodus*	T
Red-cockaded woodpecker	*Picoides borealis*	E
Roseate tern	*Sterna dougallii dougallii*	T
Wood stork	*Mycteria americana*	E
Reptiles		
American Alligator	*Alligator mississippiensis*	T, SA
American crocodile	*Crocodylus acutus*	T, CH
Eastern indigo snake	*Drymarchon corais couperi*	T
Gopher tortoise	*Gopherus polyphemus*	C
Green sea turtle*	*Chelonia mydas*	E
Hawksbill sea turtle*	*Eretmochelys imbricate*	E
Kemp's Ridley sea turtle*	*Lipodochelys kempii*	E
Leatherback sea turtle*	*Dermochelys coriacea*	E
Loggerhead sea turtle*	*Caretta caretta*	E
Fish		
Smalltooth sawfish*	*Pristis pectinata*	E, CH
Invertebrates		
Bartram's hairstreak butterfly	*Strymon acis bartrami*	C
Elkhorn coral	*Acropora palmata*	T, CH
Florida leafwing butterfly	*Anaea troglodyta floridalis*	C
Miami blue butterfly	*Cyclargus thomasi bethunebakeri*	E
Schaus swallowtail butterfly	*Heraclides aristodemus ponceanus*	E
Staghorn coral	*Acropora cervicornis*	T, CH
Stock Island tree snail	*Orthalicus reses* (not incl. *nesodryas*)	T
Plants		
Crenulate lead plant	*Amorpha crenulata*	E
Deltoid spurge	*Chamaesyce deltoidea* spp. *deltoidea*	E
Garber's spurge	*Chamaesyce garberi*	T
Johnson's seagrass*	*Halophila johnsonii*	E, CH
Okeechobee gourd	*Cucurbita okeechobeensis* ssp. *okeechobeenis*	E

Small's milkpea	*Galactia smallii*	E
Tiny polygala	*Polygala smallii*	E
Big pine partridge pea	*Chamaecrista lineata* var. *keyensis*	C
Blodgett's silverbush	*Argythamnia blodgettii*	C
Cape Sable thoroughwort	*Chromolaena frustrata*	E, CH
Carter's small-flowered flax	*Linum carteri* var. *carteri*	Pr E
Everglades bully	*Sideroxylon reclinatum* spp. *austrofloridense*	C
Florida brickell-bush	*Brickellia mosieri*	Pr E, Pr CH
Florida bristle fern	*Trichomanes punctatum* spp. f*loridanum*	C
Florida pineland crabgrass	*Digitaria pauciflora*	C
Florida prairie-clover	*Dalea carthagenensis* var. *floridana*	C
Florida semaphore cactus	*Consolea corallicola*	E
Pineland sandmat	*Chamaesyce deltoidea* ssp. *pinetorum*	C
Sand flax	*Linum arenicola*	C

* Marine species under the purview of National Marine Fisheries Service (NOAA Fisheries), the Corps will conduct a separate consultation with NOAA Fisheries.

Table 2. List of State-listed species, not otherwise federally designated, within the project area (E: Endangered, T: Threatened, SC: Species of Special Concern).

Common Name	Scientific Name	Status
Mammals		
Everglades mink	*Neovison vison evergladensis*	T
Florida mouse	*Podomys floridanus*	SC
Birds		
Snowy plover	*Charadrius nivosus*	T
American oystercatcher	*Haematopus palliates*	SC
Brown pelican	*Pelecanus occidentalis*	SC
Black skimmer	*Rynchops niger*	SC
Least tern	*Sterna antillarium*	T
White-crowned pigeon	*Patagioenas leucocephala*	T
Limpkin	*Aramus guarauna*	SC
Little blue heron	*Egretta caerulea*	SC
Tricolored heron	*Egretta tricolor*	SC
Snowy egret	*Egretta thula*	SC
Reddish egret	*Egretta rufescens*	SC
White ibis	*Eudocimus albus*	SC
Roseate spoonbill	*Platalea ajaja*	T
Fish		
Mangrove gambusia	*Gambusia rhizophorae*	SC
Mangrove rivulus	*Rivulus marmoratus*	SC

Invertebrates		
Florida tree snail	*Liguus fasciatus*	SC
Plants		
Pine-pink orchid	*Bletia purpurea*	T
Lattace vein fern	*Thelypteris reticulate*	E
Eatons spikemoss	*Selaginella eatonii*	E
Wright's flowering fern	*Anemia wrightii*	E
Tropical fern	*Schizaea pennula*	E
Mexican vanilla	*Vanilla mexicana*	E

The complete species list provided in Tables 1 and 2 concludes the statutory requirements set forth in 50 CFR §402.12(d) of the Act. Please be aware that verification of current accuracy of the species list is for a time period not to exceed 90 days as stated in 50 CFR §402.12(e) of the Act. If the Corps does not begin preparation of the biological assessment within 90 days of receipt of (or concurrence with) the species list, then they must verify (formally or informally) with the Service the current accuracy of the species list at the time the preparation of the biological assessment is begun. Further, the Corps shall complete the biological assessment within 180 days after its initiation (receipt of or concurrence with the species list) consistent with 50 CFR §402.12(i) of the Act.

Thank you for your cooperation in the effort to conserve fish and wildlife resources. If you have questions concerning this consultation process, please contact the project biologist Kevin Palmer at 773-469-4280.

Sincerely yours,

for Bob Progulske
Everglades Program Supervisor
South Florida Ecological Services Office

cc:
Corps, Jacksonville, Florida (Melissa Nasuti)

Nasuti, Melissa A SAJ

From: Palmer, Kevin [kevin_palmer@fws.gov]
Sent: Wednesday, December 17, 2014 11:23 AM
To: Nasuti, Melissa A SAJ
Cc: miles meyer; Lori Miller
Subject: [EXTERNAL] Species list for G-3273 Relaxation

Melissa,

Thank you for requesting an update to the federally listed species and their designated critical habitat and candidate species list that may be present within the G-3273 Constraint Relaxation/S-356 Field Test and S-357N Operational Strategy project area. Our original letter was submitted on September 11, 2014, and the 90-day verification window has ended. We feel that if the following amendments to the table are made, the Corps will have an accurate species list which will be good for an additional 90 days.

1. The status designation for the wood stork should be changed to T
2. The Carter's small-flowered flax status designation should be changed to E, Pr CH
3. The Florida brickell-bush status designation should be changed to E, Pr CH
4. The Florida bristle fern status designation should be changed to Pr E

Again, thank you for coordinating with the Service on this requirement and we look forward to seeing a successful field test of the G-3273 and other system components.

Please call with any questions.

Kevin

--

****
Kevin Palmer
U.S. Fish and Wildlife Service
South Florida Ecological Services Field Office
1339 20th Street
Vero Beach, Florida 32960-3559
Phone: 772-469-4280
Fax: 772-562-4288 & 564-7393
Email: Kevin_Palmer@fws.gov

United States Department of the Interior

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

February 2, 2015

Eric Summa
Chief, Environmental Branch
U.S. Army Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

Service Consultation Code: 04EF2000-2015-I-0062
Date Received: January 22, 2015
Project: G-3273 Constraint Relaxation/ S-356 Field Test and S-357N Operational Strategy
County: Miami-Dade

Dear Mr. Summa:

The U.S. Fish and Wildlife Service (Service) has reviewed the Complete Initiation Package (CIP) for the G-3273 Constraint Relaxation / S-356 Field Test and S-357N Operational Strategy by the U.S. Army Corps of Engineers (Corps) dated January 6, 2015, and the updated CIP received via email January 22, 2015.

The Service supports the project and has the following comment and recommendation:

The Service understands it is a general expectation and assumption the project will decrease flows through the S-12s with more water being delivered towards the east in the L-29 canal. It is also understood the Corps has not conducted any modeling to verify this assumption and an adequate model has not been developed. The Service also understands there are many uncertainties being addressed with water management operations.

The Service recommends that during the test, flows through each S-12 structure (A, B, C, and D) be analyzed as part of the monitoring and assessment of project data. A comparison of flows through these structures with the project compared to the flows that would have occurred if the project were not operating is recommended. This analysis should provide ecological benefit conclusions from the project for the Cape Sable Seaside Sparrow subpopulation A and its habitat.

Once a reply is received concerning this recommendation, the Service will complete its review of the CIP determinations made by the Corps in their letter dated January 6, 2015, and the updated CIP dated January 22, 2015.

Thank you for the opportunity to review the initiation package and provide comments. If you have any questions regarding this letter, please contact Lori Miller at 772-469-4231, or via email at Lori_Miller@fws.gov.

Sincerely yours,

for Donald (Bob) Progulske
Everglades Program Supervisor
South Florida Ecological Services Office

cc: electronic only
Corps, Jacksonville, Florida (Melissa Nasuti)

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

FEB 0 6 2015

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

Dear Mr. Williams:

The U.S. Army Corps of Engineers (Corps) is in receipt of your January 22, 2014 response to our Complete Initiation Package Request for the Gage-3273 (G-3273) constraint and operation of water control structures S-356 and S-357 N. The purpose of this field test is to evaluate raising or removing the existing G-3273 stage constraint to enable increased water deliveries from Water Conservation Area 3A (WCA 3A) to Everglades National Park through Northeast Shark River Slough for the benefit of natural resources. In addition, relaxation or removal of the G-3273 constraint is a Term and Condition of the 2010 Everglades Restoration Transition Plan Biological Opinion. The field test is the first in a series of sequential efforts that are intended to incorporate constructed features of the Modified Water Deliveries to Everglades National Park and Canal 111 South Dade projects into system-wide Central and Southern Florida Project operations. As requested in your January 22, 2014 letter, the Corps will provide as part of the monitoring and assessment of project data a comparison of flows through the S-12 structures. This assessment will be limited to the duration of the project and will be provided to the U.S. Fish and Wildlife Service on an annual basis at the end of each water year (i.e. October 1 through September 30).

Pursuant to the Endangered Species Act, the Corps requests your concurrence on species effect determinations as provided in our January 6, 2015 Complete Initiation Package. If you have any questions concerning this project or our determination, please contact Mrs. Melissa Nasuti by email Melissa.A.Nasuti@usace.army.mil or by telephone 904-232-1368. Thank you for your assistance in this matter.

Sincerely,

Kenneth R Duggler

for Eric P. Summa
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

United States Department of the Interior

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

February 10, 2015

Eric Summa
Chief, Environmental Branch
U.S. Army Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

Service Consultation Code: 04EF2000-2015-I-0062
Date Received: January 27, 2015
Project: G-3273 Constraint Relaxation / S-356 Field Test and S-357N Operational Strategy
County: Miami-Dade

Dear Mr. Summa:

The U.S. Fish and Wildlife Service (Service) has reviewed the Complete Initiation Package (CIP) for authorization of Increment 1 of the G-3273 Constraint Relaxation / S-356 Field Test and S-357N Operational Strategy by the U.S. Army Corps of Engineers (Corps) dated January 6, 2015, and the updated CIP received via email January 22, 2015. This letter is submitted in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 et seq.) and the provisions of the Fish and Wildlife Coordination Act of 1958, as amended (48 Stat. 401; 16 U.S.C. 661 et seq.). The Corps has completed an evaluation of the impacts of the project on threatened and endangered species in the attached Table 1.

PROJECT DESCRIPTION

The G-3273 constraint relaxation is intended to increase the availability of water deliveries from the S-333 in WCA-3A to Everglades National Park (ENP) through Northeast Shark River Slough (NESRS) for the benefit of natural resources. Currently, the use of S-333 is periodically restricted by the existing G-3273 stage constraint of 6.8 feet NGVD. The G-3273 constraint has existed since 1985 as a flood protection measure for residential areas to the east of ENP. Since many features have been built since 1985, including protective levees around the 8.5 Square Mile Area (SMA) and much of the C-111 South Dade Project detention areas to the south, there are more opportunities to begin relaxation of the G-3273. The S-356 pump will also be tested during this first increment. The pump is designed to return seepage back into the L-29 canal and to make that water available to ENP through NESRS. Lastly, the current water control plan for water flowing from the water conservation areas to ENP and the South Dade Conveyance System (WCAs-ENP-SDCS) does not contain water management operating criteria for the planned spillway (S-357N) located in the 8.5 SMA. Therefore, interim water management operating criteria for the planned 8.5 SMA gated culvert S-357N will be implemented in conjunction with Increment 1.

THREATENED AND ENDANGERED SPECIES

The Service supports the project and concurs with your determinations pursuant to the Endangered Species Act for effects on federally listed species and critical habitat as illustrated in Table 1. The project does not appear to adversely affect threatened or endangered species or otherwise inhibit the regular system operations as defined by Everglades Restoration Transition Plan (ERTP).

REINITIATION NOTICE

This concludes consultation on the action outlined in the CIP, Appendix A - The Operational Strategy, and Appendix C - The Monitoring Plan provided by the Corps regarding any adverse effects to federally-listed threatened and endangered species.

As provided in 50 CFR 402.16, reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of any incidental take detailed is exceeded; (2) new information reveals effects of the applicant's action that may affect listed species or critical habitat in a manner or to an extent not considered in this letter; (3) the applicant's action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this letter; or (4) a new species is listed or critical habitat designated that may be affected by the action.

Thank you for the opportunity to review the initiation package and provide comments. If you have any questions regarding this letter, please contact Lori Miller at 772-469-4231, or via email at Lori_Miller@fws.gov.

Sincerely yours,

for Donald (Bob) Progulske
Everglades Program Supervisor
South Florida Ecological Services Office

cc: electronic only
Corps, Jacksonville, Florida (Melissa Nasuti)

TABLE 1. Federally threatened and endangered species within the project area and effects determination of the proposed action

Common Name	Scientific Name	Status	May Affect, Likely to Adversely Effect	May Affect, Not Likely to Adversely Effect	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
Gopher tortoise	*Gopherus polyphemus*	C			X
Green sea turtle*	*Chelonia mydas*	E			X
Hawksbill sea turtle*	*Eretmochelys imbricate*	E			X

Kemp's Ridley sea turtle*	*Lipodochelys 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*	C			X
Elkhorn coral	*Acropora palmata*	T, CH			X
Florida leafwing butterfly	*Anaea troglodyta floridalis*	C			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. *okeechobeenis*	E			X
Small's milkpea	*Galactia smallii*	E		X	
Tiny polygala	*Polygala smallii*	E		X	
Big pine partridge pea	*Chamaecrista lineata* var. *keyensis*	C			X
Blodgett's silverbush	*Argythamnia blodgettii*	C			X
Cape Sable thoroughwort	*Chromolaena frustrata*	E, CH			X
carter's small-flowered flax	*Linum carteri* var. *carteri*	E, Pr CH			X
Everglades	*Sideroxylon*	C			X

bully	*reclinatum* spp. *austrofloridense*				
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*	C			X

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

* Marine species under the purview of the National Marine Fisheries Service (NMFS), the Corps will conduct a separate consultation with NMFS.

United States Department of the Interior

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

May 22, 2015

Colonel Alan M. Dodd
U.S. Army Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

Service Consultation Code: 04EF2000-2015-I-0062
Date Received: January 27, 2015
Project: G-3273 Constraint Relaxation / S-356 Field Test and S-357N Operational Strategy
County: Miami-Dade

Dear Colonel Dodd:

The U.S. Fish and Wildlife Service (Service) has reviewed your letter dated March 27, 2015, concerning Increment 1 of the G-3273 Constraint Relaxation / S-356 Field Test and S-357N Operational Strategy. This letter is submitted in response to your request that we reaffirm our continued support for the project and confirm our previous conclusion that the test is not likely to adversely affect threatened and endangered species. It is also intended to document the operational flexibilities that the U.S. Army Corps of Engineers (Corps) proposes to employ this year within the Everglades Restoration Transition Plan (ERTP) Phase I, as well as the Dye Tracer Test for western Shark River Slough.

PROJECT DESCRIPTION

The G-3273 constraint relaxation is intended to increase the availability of water deliveries from the S-333 in WCA-3A to Everglades National Park (ENP) through Northeast Shark River Slough (NESRS) for the benefit of natural resources. Currently, the use of S-333 is periodically restricted by the existing G-3273 stage constraint of 6.8 feet NGVD. The G-3273 constraint has existed since 1985 as a flood protection measure for residential areas to the east of ENP. Since 1985 many features have been built, including protective levees around the 8.5 Square Mile Area (SMA) and much of the C-111 South Dade Project detention areas to the south providing opportunities to begin relaxation of the G-3273. The S-356 pump will also be tested during this first increment. The pump is designed to return seepage back into the L-29 canal and to make that water available to ENP through NESRS. Lastly, the current water control plan for water flowing from the water conservation areas to ENP and the South Dade Conveyance System (WCAs-ENP-SDCS) does not contain water management operating criteria for the planned spillway (S-357N) located in the 8.5 SMA. Therefore, interim water management operating criteria for the planned 8.5 SMA gated culvert S-357N will be implemented in conjunction with Increment 1.

SERVICE RESPONSE

As a result of the consultation on this project, the Corps agreed to provide an on-going analysis that compares flows through S-12A, S-12B, S-12C, and S-12D that would have occurred with ERTP and observed flows with Increment 1. This analysis will continue for the duration of the test to ascertain the effects of the G-3273 relaxation on structural flows at the S-12s. This information will be integral in determining future operations of the S-12s as we continue our consultation on ERTP Phase 2. Additionally, after the conclusion of Increment 1, it is anticipated that Increment 2 of the test will allow for increased stages within the L-29 canal up to 8 feet possibly as early as 2016 or 2017, further increasing the options available for the S-12 structures, especially S-12A and S-12B.

The Service continues to support the G-3273 Constraint Relaxation / S-356 Field Test and S-357N Operational Strategy and reiterates our previous determinations pursuant to the Endangered Species Act for effects on federally listed species and critical habitat as stated in our February 10, 2015, letter.

In addition, based on our discussions with Corps staff on May 14, 2015, the Service understands that the Corps' plans to employ operational flexibilities within ERTP this year include maximizing flows through the S-12 structures from the east to the west as capacity allows. This flexibility will ensure that regulatory releases from Water Conservation Area 3A (WCA-3A) are prioritized to the east to the extent practicable to reduce flows into western Shark River Slough where the Cape Sable seaside sparrow, subpopulation A, occurs. In addition, when conditions allow, the Service understands that the Corps will delay opening and/or closure of the S-12A, S-343A/B, S-344, and S-12B structures beyond their current restrictions to further limit flow into western Shark River Slough. In order to provide increased benefits to sparrow populations east of Shark River Slough, the Service understands that the Corps will work in conjunction with the Service and the South Florida Water Management District to alter the order of pumping at the S-332B, S-332C, and S-332D structures to meet sparrow needs when conditions allow. Finally, the Service understands that ERTP includes the provision for preemptive releases. Preemptive releases are used to create storage within WCA-3A when large adjustments to inflow into WCA-3A or large regional rainfall events are forecasted. This flexibility will assist to maintain target stages within WCA-3A and allow for further flexibility in discharges through the S-12 and S-333 structures. The Service supports the Corps' planned use of these existing flexibilities within ERTP Phase 1 to the maximum extent possible to protect the Cape Sable seaside sparrow and its habitat with the goal of maximizing the number of consecutive dry days within the nesting season and decreasing the number of days of discontinuous hydroperiod.

The Service also understands that the Corps is planning to implement the Dye Tracer Test in order to identify the source of water entering western Shark River Slough. The results of the Dye Tracer Test may be used to formulate future reasonable and prudent alternative measures to address water flow into Cape Sable seaside sparrow, subpopulation A, habitat.

Within the context of the ongoing, reinitiated consultation concerning future ERTP operations after this year, we look forward to continuing our discussion of additional options that could further enhance survival and recovery of the Cape Sable seaside sparrow, including, but not

limited to, increasing duration of closures of the S-12A and S-12B, utilizing existing infrastructure to divert water away from S-12A and S-12B, utilizing potential storage within WCA-3B to moderate maximum stages in WCA-3A, increasing capacity of the S-333, degrading the L-67 extension, and investigating the source of seepage in western WCA-3A.

Thank you for the opportunity to respond to your letter. If you have any questions regarding this letter, please contact Miles Meyer at 772-469-4281, or via email at Miles_Meyer@fws.gov.

Sincerely yours,

Larry W Williams

Larry Williams
State Supervisor
Florida Ecological Services

PROPOSED G-3273 CONSTRAINT RELAXATION/S-356 FIELD TEST AND S-357N OPERATIONAL STRATEGY

SPECIES DETERMINATION OF EFFECTS

NATIONAL MARINE FISHERIES SERVICE

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1.0 PROJECT AUTHORITY

A minimum schedule of water deliveries from the Central and Southern Florida (C&SF) Project to Everglades National Park (ENP) was authorized by Congress in 1970 in Public Law (PL) 91-282. Section 1302 of the Supplemental Appropriations Act of 1984 (PL 98-181), passed in December 1983, authorized the U.S. Army Corps of Engineers (Corps), with the concurrence of the National Park Service (NPS) and South Florida Water Management District (SFWMD), to deviate from the minimum delivery schedule for two years in order to conduct an Experimental Program of water deliveries to improve conditions within ENP. Section 107 of PL 102-104 amended PL 98-181 to allow continuation of the Experimental Program until modifications to the C&SF Project, authorized by Section 104 of the ENP Protection and Expansion Act of 1989 (PL 101-229) were completed and implemented. The purpose of PL 101-229 was "To modify the boundaries of the Everglades National Park and to provide for the protection of lands, waters, and natural resources within the park, and for other purposes". This act also authorized the Secretary of the Army, upon completion of a General Design Memorandum (GDM), to modify the C&SF Project to improve water deliveries to the park and to the extent practicable permit steps to restore the natural hydrology within the park. The Modified Water Deliveries (MWD to ENP GDM and Final Environmental Impact Statement (EIS) were published in July 1992 (USACE 1992).

When the Corps completed the MWD GDM and Final EIS in 1992, the operational plan identified in the GDM was not considered final. The recommended plan was selected on the basis of expected environmental benefits derived from a modified water delivery schedule. The GDM called for hydrologic modeling, coordination of modeling results, and environmental evaluations to develop an acceptable water control plan. The GDM also recognized that review and adjustment of project operations would continue as experience and additional assessment of data revealed potential for improvement.

The PL for the MWD Project (PL 101-229) was amended as PL 108-7 (Appropriations Act, 2003). This authorization bill identified Alternative 6D (the Selected Alternative in the July 2000 General Reevaluation Report [GRR] and Final Supplemental EIS for 8.5 Square Mile Area [8.5 SMA]) as the plan to be built, authorized relocation of residents, and other provisions (USACE 2000).

2.0 LOCATION

The MWD Project is a specific feature of the C&SF Project that is located in south Florida and includes portions of Miami-Dade County as well as portions of ENP and adjacent areas (**FIGURE 1**). The 1992 MWD GDM and Final EIS defines the project boundary as Shark River Slough (SRS) and that portion of the C&SF Project north of structure 331 (S-331) to include Water Conservation Area 3 (WCA 3).

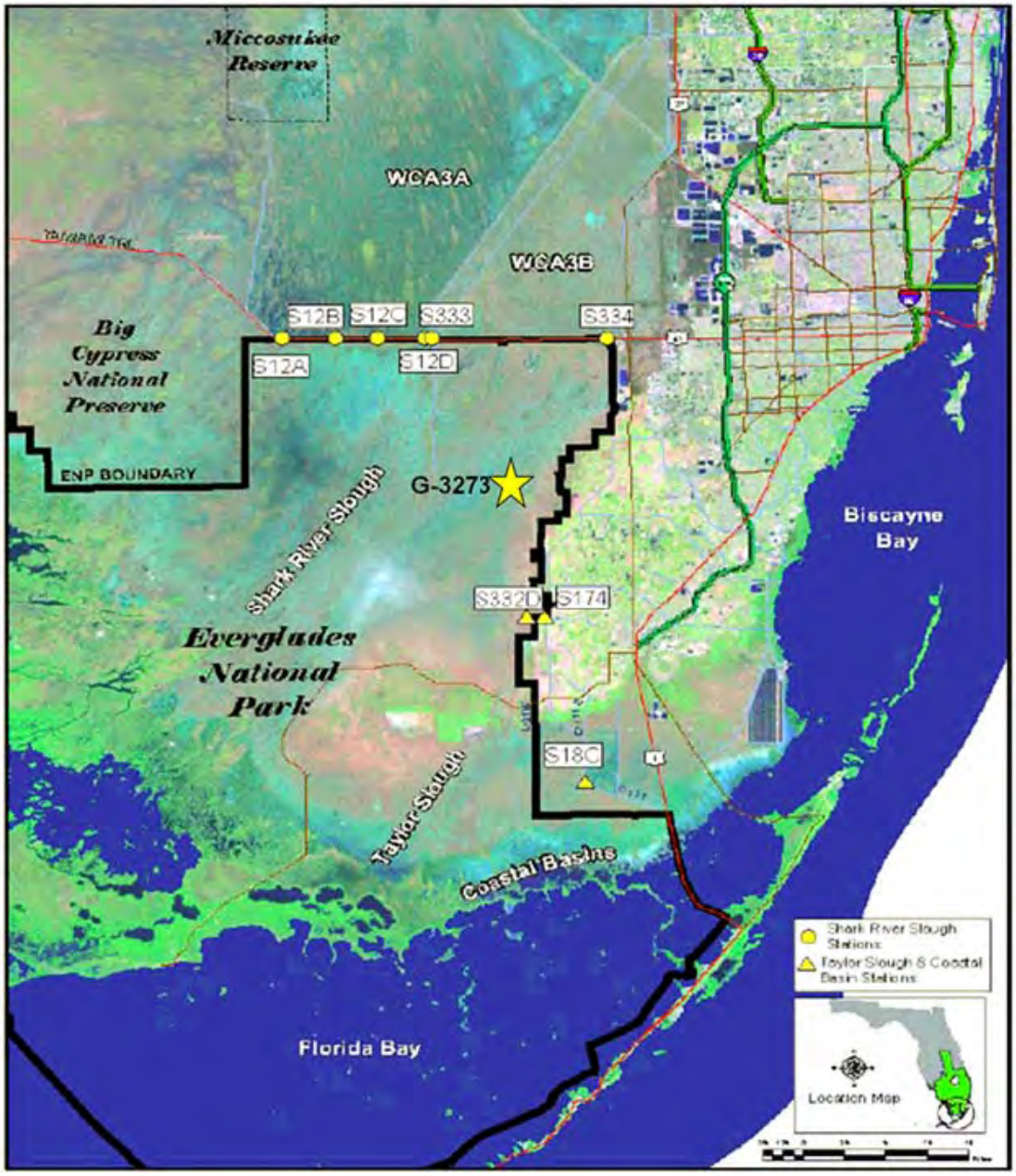

FIGURE 1. PROJECT LOCATION

3.0 PROJECT BACKGROUND

The MWD Project provides a system of water deliveries to ENP across the full width of the historic SRS flow-way and consists of four main components: (1) conveyance and seepage control features to facilitate flow through the system from WCA 3A to WCA 3B and to limit seepage eastward from WCA 3B and ENP; (2) modifications to Tamiami Trail to facilitate flow under the road to SRS; (3) flood mitigation for the developed East Everglades area (also referred to as the 8.5 SMA); and (4) project implementation support, which includes monitoring and operational changes. The MWD GDM and Final EIS (USACE 1992) includes a discussion of the location, capacity, and environmental impacts for the proposed structural modifications,

which included structures S-345A, B and C; S-349A, B and C; S-355A and B; S-334 modification, removal of the L-67 extension levee and borrow canal filling; and a levee and canal system for flood mitigation in 8.5 SMA. The levee and canal system included two pumping stations, S-356 and S-357 (**FIGURE 2**).

The 8.5 SMA features were constructed to provide flood mitigation to the Las Palmas Community in order to prevent impacts from higher stages within Northeast Shark River Slough (NESRS) resulting from the implementation of MWD to the private land owners located east of ENP. A GRR and Final Supplemental EIS for 8.5 SMA were completed in July 2000 (USACE 2000). The GRR recommended Alternative 6D, consisting of a perimeter levee (Levee 357W [L-357W]), internal levees, a seepage collection canal, a new pump station (S-357), and a detention cell that would discharge into the proposed C-111 South Dade North Detention Area (NDA), as part of the C-111 South Dade Project (**FIGURE 2**). A design refinement for 8.5 SMA and environmental assessment (EA) were completed in August of 2012 (USACE 2012a). An operational test conducted in 2009 indicated that the S-357 pump station may have greater efficiency with removing water from the 8.5 SMA and adjacent lands than envisioned, causing an increase in seepage in the southwest corner. To allow for utilization of the S-357 pump station at maximum capacity, an additional east-west seepage collection canal (C-358) was identified to prevent groundwater stage increases in the southwest corner (east of L-357W). In addition, the 8.5 SMA detention area would need to be connected to the proposed C-111 South Dade NDA. A structure (S-357N), not yet constructed, would connect this seepage collection canal to the existing infrastructure.

Construction of the 8.5 SMA features, as described in the July 2000 GRR and Final Supplemental EIS was completed prior to completion of the proposed full build-out of the C-111 South Dade NDA. The C-111 South Dade Project was constructed as part of the ENP–South Dade Conveyance Canals Project authorized by the Flood Control Act (FCA) of 1968 PL 90-483. This Act authorized modifications to the existing C&SF Project as previously authorized by the FCAs of 1948 (PL 80-858) and 1962 (PL 87-874). Further modifications to the C-111 were authorized as an addition to the C&SF project in the Water Resources Development Act (WRDA) of 1996 (PL 104-303). The C-111 South Dade Integrated GRR and EIS was published in May 1994 (USACE 1994). This report described a conceptual plan for five pump stations and levee-bounded retention/detention areas to be built west of the L-31N Canal, between the 8.5 SMA and the Frog Pond Area to control seepage out of ENP while providing flood mitigation to agricultural lands east of C-111 Canal (**FIGURE 2**). The original and existing configuration of these structural features are described in detail in the 2006 Interim Operational Plan (IOP) for Protection of the Cape Sable Seaside Sparrow Final Supplemental EIS (USACE 2006) and the 2012 EA for the expansion of the C-111 South Dade NDA (USACE 2012b).

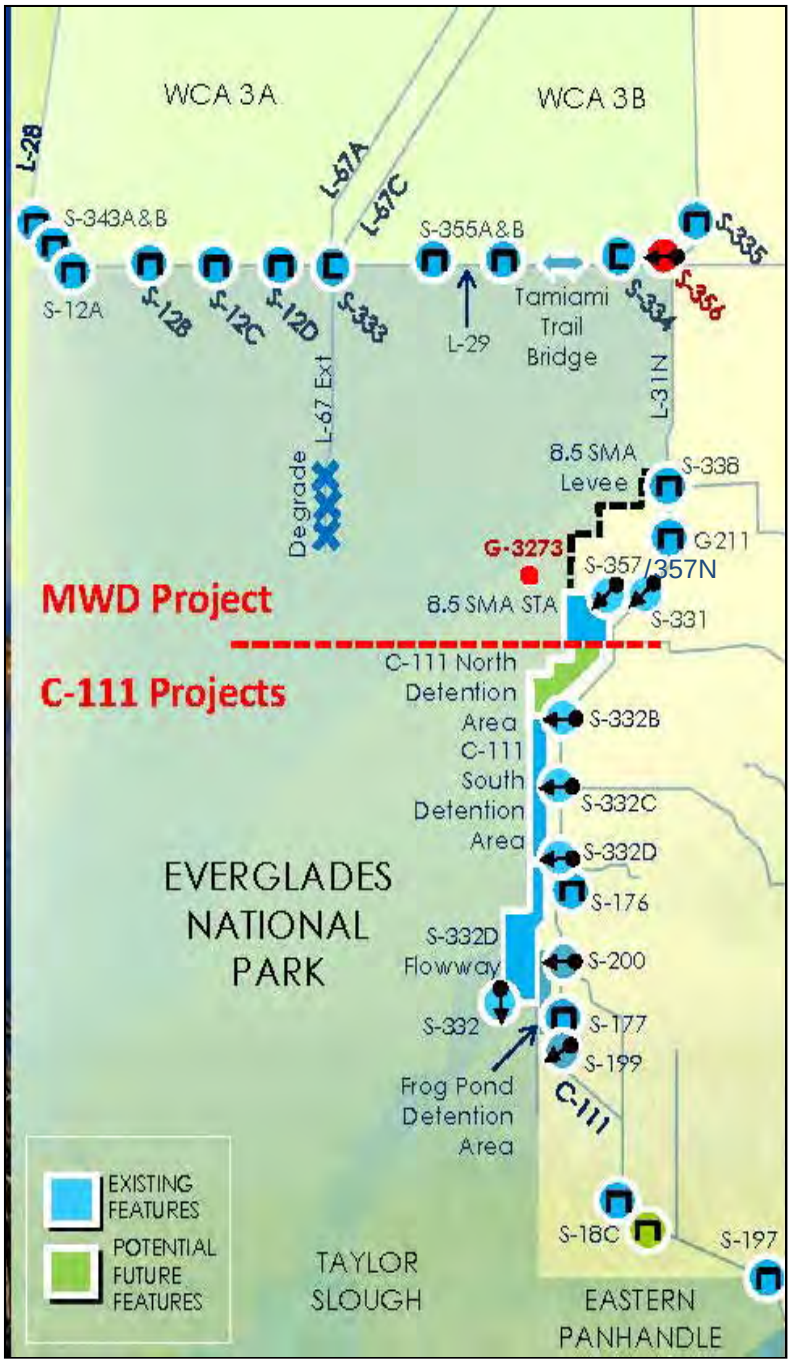

FIGURE 2. RELEVANT C&SF PROECT FEATURES OF THE MWD PROJECT AND C-111 SOUTH DADE PROJECTS

Much of the MWD Project has been completed, including the 8.5 SMA Project, construction of S-355A and B, S-333 and S-334 modifications, S-356, Tiger Tail camp raising, removal of four miles of the L-67 Extension Levee, and Tamiami Trail modifications. However, some features originally included in the 1992 MWD GDM and Final EIS, including features to provide hydrologic connectivity between WCA 3A and WCA 3B and complete degradation of the L-67 Extension Levee and adjacent canal, have not been completed for various reasons, including

operational (water levels) constraints within WCA 3B, lowered MWD maximum operational stages for the L-29 Canal (9.7 feet National Geodetic Vertical Datum of 1929 [NGVD] was assumed with the 1992 MWD GDM and Final EIS), and potential water quality concerns.

Constructed features of the C-111 South Dade Project include the detention areas 332-B, 332-C and 332-D, the L-320 and L-322 levees which form the east and west boundary of the C-111 South Dade buffer area from S-332 D north to S-332 C, and the L-323 levee which completes the S-333 B-C connector and forms a secondary buffer area east of the C-111 South Dade area.

Operations in the project area are currently governed by the WCAs, ENP, ENP to South Dade Conveyance System (SDCS) Water Control Plan (USACE 2012c). The Corps, Jacksonville District, is initiating the Gage-3273 (G-3273) and S-356 operations field test to raise the current operational stage constraint for G-3273, and operate the S-356 pump station to return seepage from NESRS to the adjacent L-31N Canal. The field test will also implement a testing protocol to assist in defining operating criteria for the new 8.5 SMA S-357N water control structure following completion of construction. The MWD Increment 1 Field Test will be the first increment in a series of three related, sequential efforts that will result in a comprehensive integrated water control plan, referred to as the Combined Operating Plan (COP), for the operation of the water management infrastructure associated with the MWD and C-111 South Dade Projects.

The first increment will maintain the current 7.5 feet NGVD maximum operating limit in the L-29 Canal. Information and operational criteria identified from the field test (Increment 1) will be used to develop an expanded set of operations and monitoring criteria for a subsequent operational field test (Increment 2) that will raise the maximum operating limit in the L-29 Canal level above 7.5 feet NGVD, up to a maximum of 8.5 feet NGVD, as outlined in the 1992 MWD GDM and Final EIS (USACE 1992). The third increment is development of the COP that incorporates constructed features of the MWD and C-111 South Dade Projects into the WCAs-ENP-SDCS Water Control Plan (USACE 2012c). Increment 3 will be informed by the Increment 1 and Increment 2 field tests.

4.0 PROJECT NEED OR OPPORTUNITY

The overarching project need is to increase the availability of S-333 to increase water deliveries from WCA 3A to ENP through NESRS for the benefit of natural resources. A small incremental step toward achieving that goal is to reduce the number of times S-333 discharges are limited by the existing G-3273 stage constraint of 6.8 feet NGVD. G-3273 lies within eastern ENP, directly west of the 8.5 SMA (**FIGURE 1**). The G-3273 constraint of 6.8 feet, NGVD exists as a flood protection measure. A stage of 6.8 feet NGVD at this gage has been used since 1985 as a trigger to cease S-333 discharges from flowing south into NESRS as a protective measure for residential areas to the east, particularly the 8.5 SMA. Since many of the MWD features have been built, including the protective levee around the 8.5 SMA and much of the C-111 South Dade Project detention areas to the south, there are more opportunities to begin relaxation of the G-3273 constraint and subsequent increased water deliveries from WCA 3A into NESRS.

The releases from S-333 are part of a regulation schedule for WCA 3A and are typically dependent on the Interim Operational Procedure for Restricted Rain-Driven Water Deliveries to

ENP via NESRS (Rainfall Plan) outlined in the WCAs-ENP-SDCS Water Control Plan (USACE 2012c). This Rainfall Plan consists of a rainfall-based delivery formula that specifies the amount of water to be delivered to ENP in weekly volumes through the S-333 and S-12s. Currently, the flow distribution is 55% through S-333 into NESRS and 45% through the S-12s into ENP west of the L-67 extension levee; however, during the dry season non-regulatory target flows are 80% through S-333 and 20% through the S-12 structures. Releases through the S-333 are limited by the constraint at G-3273 under the current WCAs-ENP-SDCS Water Control Plan (USACE 2012c). Therefore, when G-3273 is below 6.8 feet NGVD, 55% of wet season and 80% of dry season Rainfall Plan target flow is released into NESRS. However, when G-3273 is above 6.8 feet NGVD, S-334 is used to pass all or partial S-333 flows through SDCS, thereby preventing water from entering NESRS. When S-333 is closed and partial flows cannot be passed through S-334, the volume of flow that could not be delivered at S-333 shifts to the S-12s. In this manner, the G-3273 constraint limits the volume of water entering NESRS. The proposed modification to the G-3273 constraint is anticipated to reduce the number of times that S-333 discharge is reduced and increase the number of times the maximum (*i.e.* 55% of wet season or 80% of dry season) Rainfall Plan deliveries from WCA 3 through S-333 into NESRS are achieved.

The current WCAs-ENP-SDCS Water Control Plan (USACE 2012c) does not contain water management operating criteria for the planned spillway (S-357N) located in the 8.5 SMA upstream of S-357, at the intersection of C-357 and the newly constructed seepage collection canal (C-358) (**FIGURE 2**). The 2012 Design Refinement for the 8.5 SMA EA did not address water management operating criteria for S-357N or C-358 and stated that all gates would be in the closed position until a new operational protocol is developed for the MWD Project (USACE 2012a). Interim water management operating criteria for the planned 8.5 SMA gated culvert S-35N will be implemented in conjunction with Increment 1.

Information obtained from Increment 1, if successful with achievement of field test goals and objectives will be codified within the current WCAs-ENP-SDCS Water Control Plan (USACE 2012c). In addition, information obtained through Increment 1 will be used to support development of a second field test (Increment 2) and subsequent consideration of future incremental modifications to the current WCAs-ENP-SDCS Water Control Plan (USACE 2012c).

5.0 PROPOSED ACTION

Summary details of the Proposed Action are listed below:

- The L-29 Canal will be managed to prevent a sustained stage above 7.5 feet NGVD (average of S-333 tail water and S-334 headwater), which is the maximum operating stage intended within the current WCAs-ENP-SDCS Water Control Plan (USACE 2012c). This will be achieved by stopping inflow into the L-29 Canal when the L-29 Canal stage rises above 7.5 feet NGVD.

- Both S-333 and S-356 releases to the L-29 Canal will be subject to the 7.5 feet NGVD constraint however, the water level at G-3273 will no longer be a constraint, allowing

NESRS to receive additional water year-round, pursuant to the WCA 3A Regulation Schedule and Rainfall Plan.

- The 6.8 feet NGVD water level at G-3273 and the WCA 3A stage level (as measured using the average of monitoring gauges/sites 63, 64, and 65) will be utilized to define the priority of releases from S-333 and S-356 to the L-29 Canal and NESRS. In addition, the field test Action Line is a seasonally varying WCA 3A stage (10.0 to 10.75 feet, NGVD) which will also serve to define the S-333 and S-356 releases to the L-29 Canal and NESRS.

- S-355 A and S-355 B may be utilized to discharge to the L-29 Canal as indicated under current operations and other future associated permit requirements.

- Implementation of a testing protocol for S-357N will be incorporated into the field test following completion of the C-358 seepage collection canal and the associated S-357N control structure.

- Additional low volume releases from S-197 are expected. The S-178 Tail Water is used as a trigger to define the opening criteria for S-197 discharges. The Proposed Action reduces the current WCAs-ENP-SDCS Water Control Plan (USACE 2012c) Level 1 S-197 opening from 800 to 500 cubic feet per second. Operating criteria for S-197 will revert to the operating criteria in the current WCAs-ENP-SDCS Water Control Plan (USACE 2012c) once Contracts 8 and 9 of the C-111 South Dade Project are constructed and operable.

- Test duration will be a minimum of one year. If weather conditions during the one year test period do not provide sufficient data for a conclusive field test, the test may be extended up to one year for a maximum of two years.

Further detailed information on the Proposed Action can be found in the G-3273 Constraint Relaxation/S-356 Field Test and S-357N Operational Strategy (**Appendix A**).

6.0 EFFECT DETERMINATIONS TO FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES

The Corps requested written confirmation of federally listed threatened and endangered species that are either known to occur or are likely to occur within the project area from the U.S. Fish and Wildlife Service (USFWS) by letter dated August 22, 2014. Concurrence on the presence of listed species was received on September 11, 2014. The USFWS provided an update to the concurrence letter on December 17, 2014. The Corps has determined that the Proposed Action will have no effect on species listed within **TABLE 1** under the purview of the National Marine Fisheries Service (NMFS). These determinations are based on the short duration of the field test and the generally beneficial nature of this action.

TABLE 1. FEDERALLY THREATENED AND ENDANGERED SPECIES WITHIN THE PROJECT AREA AND EFFECTS DETERMINATION OF THE PROPOSED ACTION

Common Name	Scientific Name	Status	May Affect, Likely to Adversely Effect	May Affect, Not Likely to Adversely Effect	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
Gopher tortoise	*Gopherus polyphemus*	C			X
Green sea turtle*	*Chelonia mydas*	E			X
Hawksbill sea turtle*	*Eretmochelys imbricate*	E			X
Kemp's Ridley sea turtle*	*Lipodochelys 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*	C			X
Elkhorn coral	*Acropora palmata*	T, CH			X
Florida leafwing butterfly	*Anaea troglodyta floridalis*	C			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. *okeechobeenis*	E			X
Small's milkpea	*Galactia smallii*	E		X	
Tiny polygala	*Polygala smallii*	E		X	
Big pine partridge pea	*Chamaecrista lineata* var. *keyensis*	C			X
Blodgett's silverbush	*Argythamnia blodgettii*	C			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. f*loridanum*	Pr E			X
Florida pineland crabgrass	*Digitaria pauciflora*	C			X
Florida prairie-	*Dalea*	C			X

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

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

* Marine species under the purview of NMFS.

6.1 Green Sea Turtle, Hawksbill Sea Turtle, Kemp's Ridley Sea Turtle, Leatherback Sea Turtle, Loggerhead Sea Turtle and "No Effect Determination"

The green sea turtle lives in tropical and sub-tropical waters. Areas that are known as important feeding areas for the green turtles in Florida include the Indian River Lagoon, the Florida Keys, Florida Bay, Homosassa, Crystal River and Cedar Key. Green turtles occupy three habitat types: high energy oceanic beaches, convergence zones in the pelagic habitat, and benthic feeding grounds in the relatively shallow, protected waters. Green sea turtles forage in pastures of seagrasses and/or algae, but small green turtles can also be found over coral reefs, worm reefs, and rocky bottoms.

The hawksbill sea turtle lives in tropical and sub-tropical waters of the Atlantic, Pacific, and Indian Oceans. Areas that are known as important feeding areas for hawksbill turtles in Florida include the waters near the Florida Keys and on the reefs off Palm Beach County. Hawksbill turtles use different habitat types at different stages of their life cycle. Post hatchlings take shelter in weed lines that accumulate at convergence zones. Coral reefs are the foraging habitat of juveniles, sub-adults, and adults. They are also known to inhabit mangrove-fringed bays and estuaries, particularly along the eastern shore where coral reefs are absent. Hawksbills feed predominantly on sponges and nest on low and high energy beaches, frequently sharing the high-energy beaches with green sea turtles.

The Kemp's ridley sea turtle is a shallow water benthic feeder consuming mainly algae and crabs. Juveniles and sub-adults have been found along the eastern seaboard of the United States and in the Gulf of Mexico. However, the major nesting beach for the Kemp's ridley sea turtle is on the northeastern coast of Mexico. This species occurs mainly in coastal areas of the Gulf of Mexico and in the northwestern Atlantic Ocean. The post-pelagic stages are commonly found dwelling over crab-rich sandy or muddy bottoms. Juveniles frequent bays, coastal lagoons, and river mouths.

The leatherback sea turtle lives in tropical and sub-tropical waters. Habitat requirements for juvenile and post-hatchling leatherbacks are virtually unknown. Nesting females prefer high-energy beaches with deep unobstructed access. Leatherbacks feed primarily on jellyfish.

Loggerhead sea turtles inhabit the continental shelves and estuarine environments along the margins of the Atlantic, Pacific, and Indian Oceans. Females select high energy beaches on

barrier strands adjacent to continental land masses for nesting. Steeply sloped beaches with gradually sloped offshore approaches are favored. After leaving the beach, hatchlings swim directly offshore and eventually are found along drift lines. They migrate to the near-shore and estuarine waters along the continental margins and utilize those areas as the developmental habitat for the sub-adult stage. Loggerheads are predators of benthic invertebrates.

Although the sea turtles are expected to be found foraging in nearshore seagrass habitats or near hardbottom habitats within Florida Bay, significant impacts to food sources are not expected. Additionally, none of the above mentioned sea turtles would attempt to utilize areas for nesting purposes since there is no suitable habitat for nesting in the project area. The Corps has determined that implementation of the Proposed Action will have no effect on the green sea turtle, hawksbill sea turtle, Kemps ridley sea turtle, leatherback sea turtle or loggerhead sea turtle.

6.2 Smalltooth Sawfish and Critical Habitat and "No Effect Determination"

Smalltooth sawfish have been reported in the Pacific and Atlantic Oceans, and the Gulf of Mexico; however, the United States population is found only in the Atlantic Ocean and Gulf of Mexico. Historically, the United States population was common throughout the Gulf of Mexico from Texas to Florida, and along the east coast from Florida to Cape Hatteras. The current range of this species includes peninsular Florida. Juvenile sawfish use shallow habitats with a lot of vegetation, such as mangrove forests, as important nursery areas. Many important nursery habitats have been modified or lost due to development of the coastal areas of Florida and other southeastern states. The loss of juvenile habitat likely contributed to the decline of this species. As stated in the final rule published in the Federal Register on 2 September 2009, critical habitat consists of two coastal habitat units: the Charlotte Harbor Estuary Unit (**FIGURE 3**) and the Thousand Islands/Everglades Unit (**FIGURE 4**).

According to the final rule designating critical habitat for the smalltooth sawfish, juvenile sawfish encounters were highly correlated with euryhaline habitat areas. By definition, the term "euryhaline" used in the designation of smalltooth sawfish critical habitat (74 FR 45353, September 2, 2009) indicates a species that is able to tolerate a wide range of salinities. Several studies conducted in recent years have tracked juvenile sawfish movements in relation to salinity changes in the Caloosahatchee River and its estuary (Simpfendorfer et al., 2011; Poulakis et al., 2011; and Poulakis et al., 2012). Simpfendorfer et al. (2011) and Poulakis et al. (2012) conducted studies to assess how changes in environmental conditions within estuarine areas affected the presence, movements, and activity space of smalltooth sawfish. Simpfendorfer et al. (2011) found that smalltooth sawfish preferred salinities between 18 and at least 24 practical saline units (psu), while longer-term studies in this region expanded that range from 18 to 30 psu (Poulakis et al., 2011; Poulakis et al., 2012). Smalltooth sawfish moved within these ranges in part to stay within this salinity preference; however, sawfish were found throughout the entire range of conditions encountered (temperatures between 14.6 and 32.6 C; salinity ranges from 0.1 to 33.6 psu, and freshwater inflow from 0.0 to 627.4 m^3s^{-1}; Simpfendorfer et al., 2011).

Jiang et al. (2012) developed a model to estimate the resilience of a halophytic mangrove and glycophytic hardwood hammock ecotone to storm surge. The authors noted that a disturbance, such as an input of salinity to the soil from a storm event, could upset this ecotone boundary.

This could possibly cause salinity-tolerant vegetation to migrate inland. For the model developed in this study, the authors found a pulse disturbance was not sufficient to cause a shift in the vegetative boundary. Any change in salinity would have to be held at a high level for some time for this type of shift to occur (Jiang et al., 2012). Although the above referenced study by Jiang et al. (2012) provides only limited data on how mangrove habitats respond to salinity variations, it suggests that gradual releases of low volume freshwater releases from S-197 would not be sufficient to affect red mangrove habitats that provide nursery functions to juvenile smalltooth.

Based on the above information, the Corps has determined that there would be no effect on the smalltooth sawfish and its designated critical habitat from implementation of the Proposed Action. The Corps will monitor existing salinity gages in Joe Bay, Long Sound, Manatee Bay, and Barnes Sound throughout the duration of the field test (**Appendix C**).

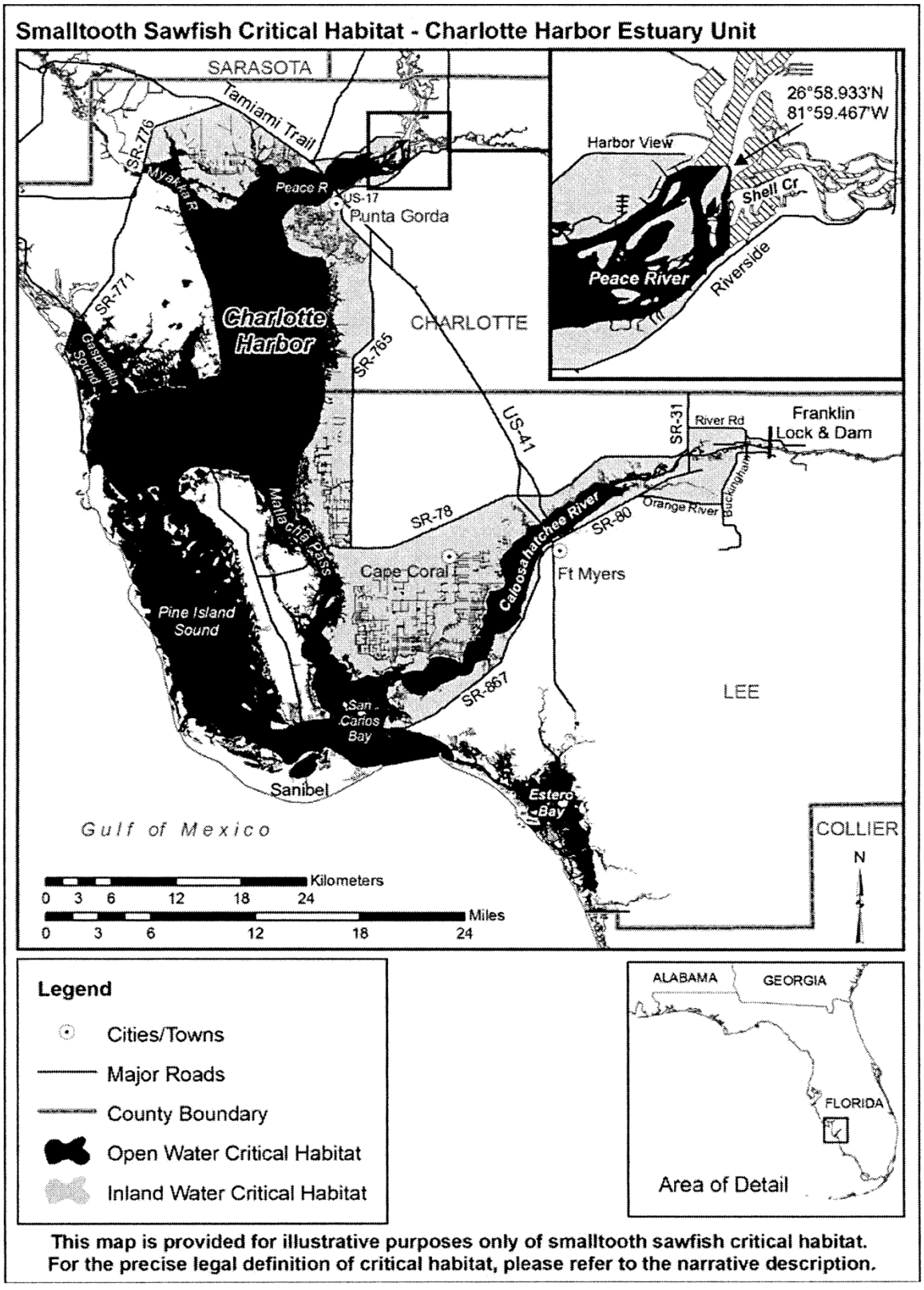

FIGURE 3. CRITICAL HABITAT FOR THE SMALLTOOTH SAWFISH - CHARLOTTE HARBOR ESTUARY UNIT

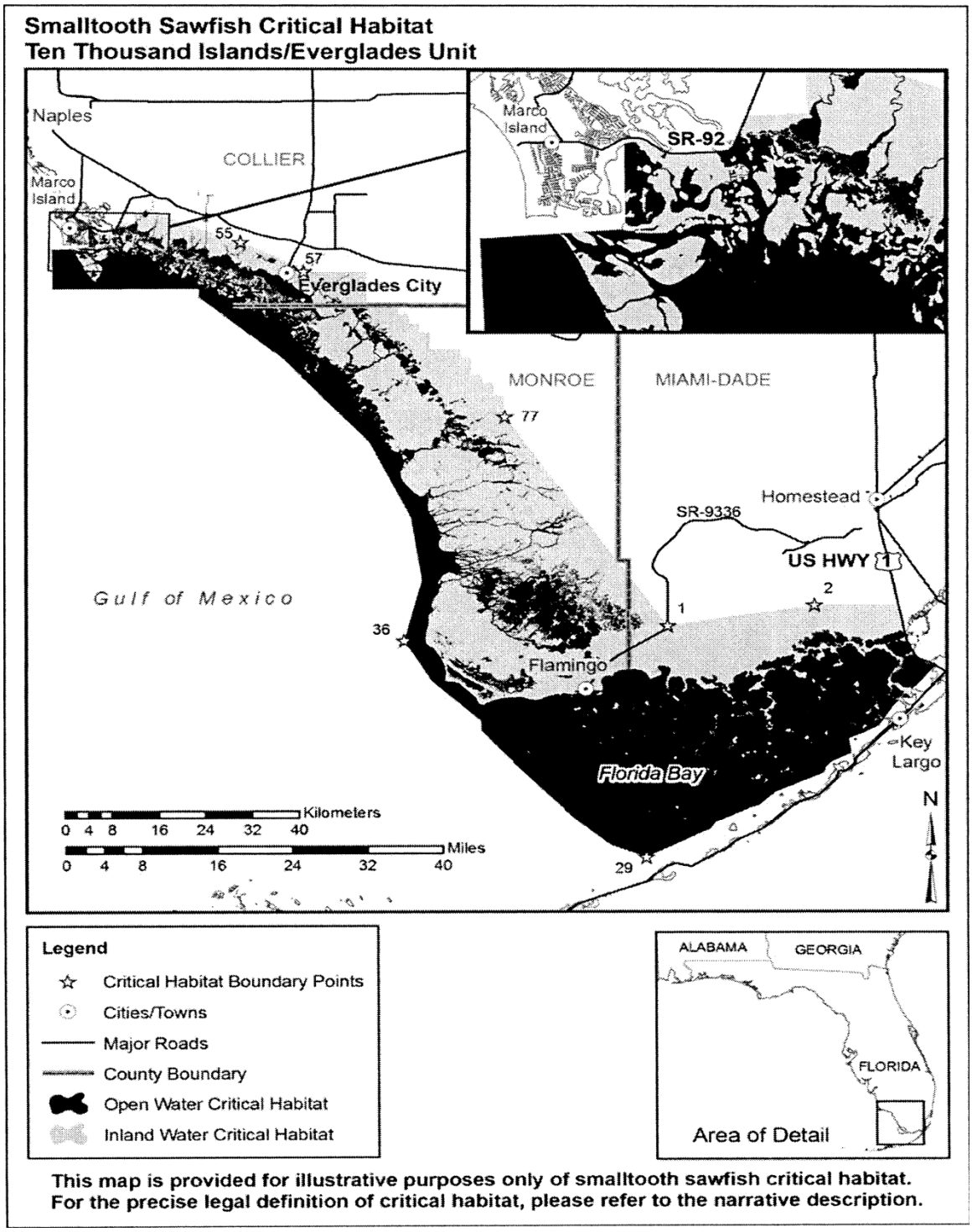

FIGURE 4. CRITICAL HABITAT FOR THE SMALLTOOTH SAWFISH – THOUSAND ISLANDS/EVERGLADES UNIT

6.3 Elkhorn and Staghorn Corals and Critical Habitat and "No Effect Determination"

Elkhorn coral is a large, branching coral with thick and sturdy antler-like branches. Elkhorn coral was formerly the dominant species in shallow water (3-16 feet deep) throughout the Caribbean and on the Florida Reef Tract, forming extensive, densely aggregated thickets in areas of heavy surf. Coral colonies prefer exposed reef crest and fore reef environments in depths of less than 20 feet, although isolated corals may occur to 65 feet. Elkhorn coral is found on coral reefs in southern Florida, the Bahamas, and throughout the Caribbean. Its northern limit is the Biscayne Bay National Park and it extends south to Venezuela; it is not found in Bermuda.

Staghorn coral is a branching coral with cylindrical branches ranging from a few centimeters to over 6.5 feet in length. Staghorn coral has been one of the three most important Caribbean corals in terms of its contribution to reef growth and fish habitat. Staghorn coral occur in back reef and fore reef environments from 0-98 feet (0-30 m) deep. Staghorn coral is found throughout the Florida Keys, the Bahamas, and the Caribbean islands. This coral occurs in the western Gulf of Mexico, but is absent from U.S. waters in the Gulf of Mexico. It also occurs in Bermuda and the west coast of South America. The northern limit is on the east coast of Florida, near Boca Raton.

In southeast Florida, staghorn coral has been documented along the east coast as far north as Palm Beach County in deeper (16 to 30 m) water and is distributed south and west throughout the coral and hard-bottom habitats of the Florida Keys, through Tortugas Bank. Elkhorn coral has been reported as far north as Broward and Miami-Dade counties, with significant reef development and framework construction by this species beginning at Ball Buoy Reef in Biscayne National Park, extending discontinuously southward to the Dry Tortugas (CFR Vol. 73, No. 25, 02-06-08). Critical habitat for both species is depicted in **FIGURE 5**.

Elkhorn and staghorn corals may be found outside the waters of Florida Bay, specifically within the offshore reef track of the Florida Keys where salinities are stable (35 psu) and more representative of open ocean conditions. The reef tract is approximately 10 to 20 miles seaward of the shoreline. The Corps has determined that the Proposed Action will have no effect on elkhorn coral and staghorn coral and their designated critical habitat.

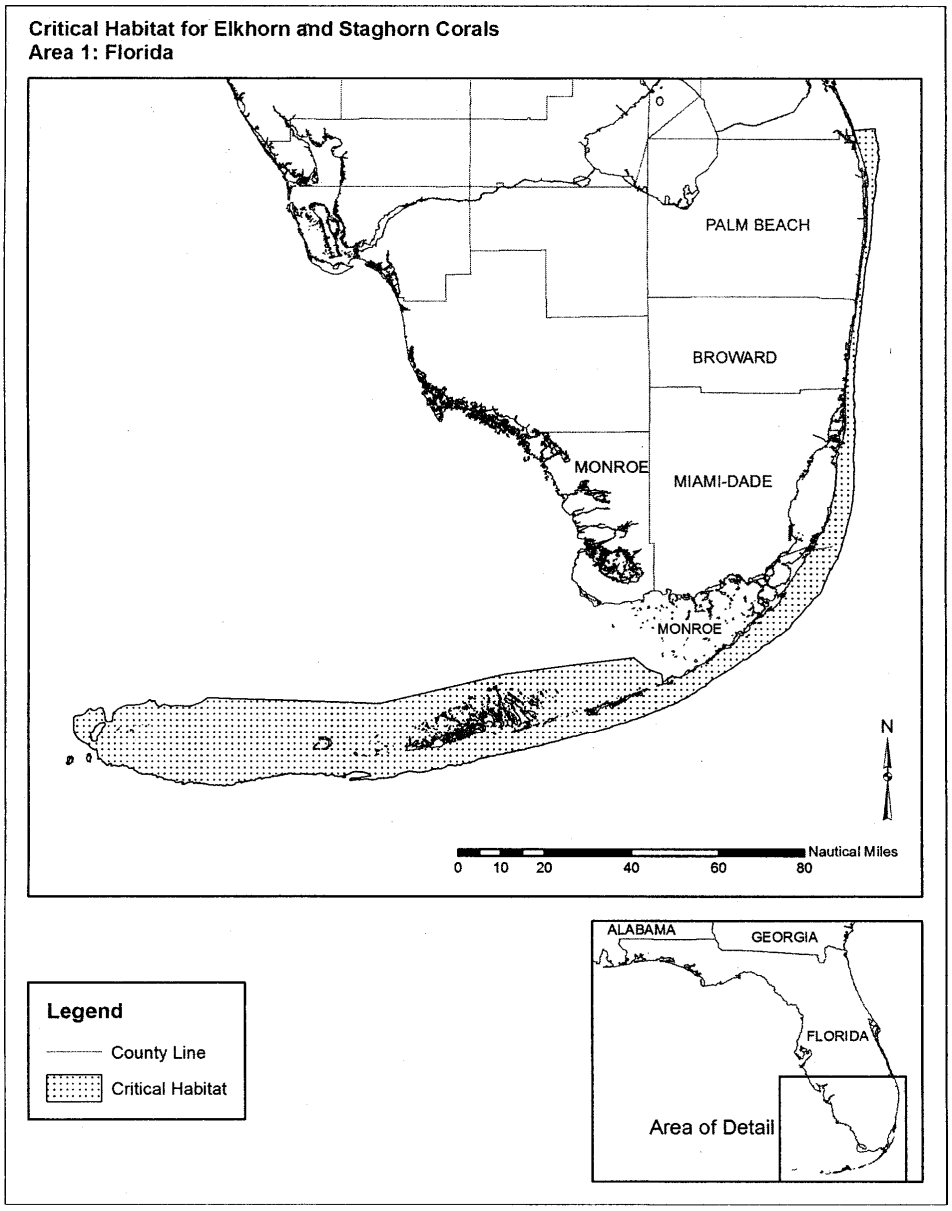

FIGURE 5. CRITICAL HABITAT FOR ELKHORN AND STAGHORN CORALS

6.4 Johnson's Seagrass and Critical Habitat and "No Effect Determination"

Johnson's seagrass is a rare plant that may have the most limited distribution of any seagrass in existence. It frequently occurs in small isolated patches from centimeters to a few meters in diameter. Johnson's seagrass prefers to grow in coastal lagoons in the intertidal zone, or deeper than many other seagrasses. It fares worse in the intermediate areas where other seagrasses thrive. The species has been found in coarse sand and muddy substrates and in areas of turbid waters and high tidal currents. Johnson's seagrass is more tolerant of salinity, temperature, and desiccation variation than other seagrasses in the area. It has a disjunct and patchy distribution along the east coast of Florida from central Biscayne Bay to Sebastian Inlet. The largest patches have been documented inside Lake Worth Inlet. The southernmost distribution is reported to be in the vicinity of Virginia Key in Biscayne Bay.

As defined in the Code of Federal Regulations (50 CFR Part 226, Section 226.213, Vol. 65, 5 April 2000), the Johnson's seagrass critical habitat includes all land and water within the following boundary: Beginning at the easternmost tip of Turkey Point, Dade County, on the coast of Biscayne Bay; then southeastward along a straight line to Christmas Point at the southernmost tip of Elliott Key; then southwestward along a line following the shores of the Atlantic Ocean side of Old Rhodes Key, Palo Alto Key, Anglefish Key, Key Largo, Plantation Key, Windley Key, Upper Matecumbe Key, Lower Matecumbe Key, and Long Key; then to the westernmost tip of Middle Cape; then northward along the shore of the Gulf of Mexico to the north side of the mouth of Little Sable Creek; then eastward along a straight line to the northernmost point of Nine-Mile Pond; then northeastward along a straight line to the point of beginning (**FIGURE 6**).

As Johnson's seagrass is not known to occur within the project area, the Corps has determined that the Proposed Action will have no effect on this species and its designated critical habitat.

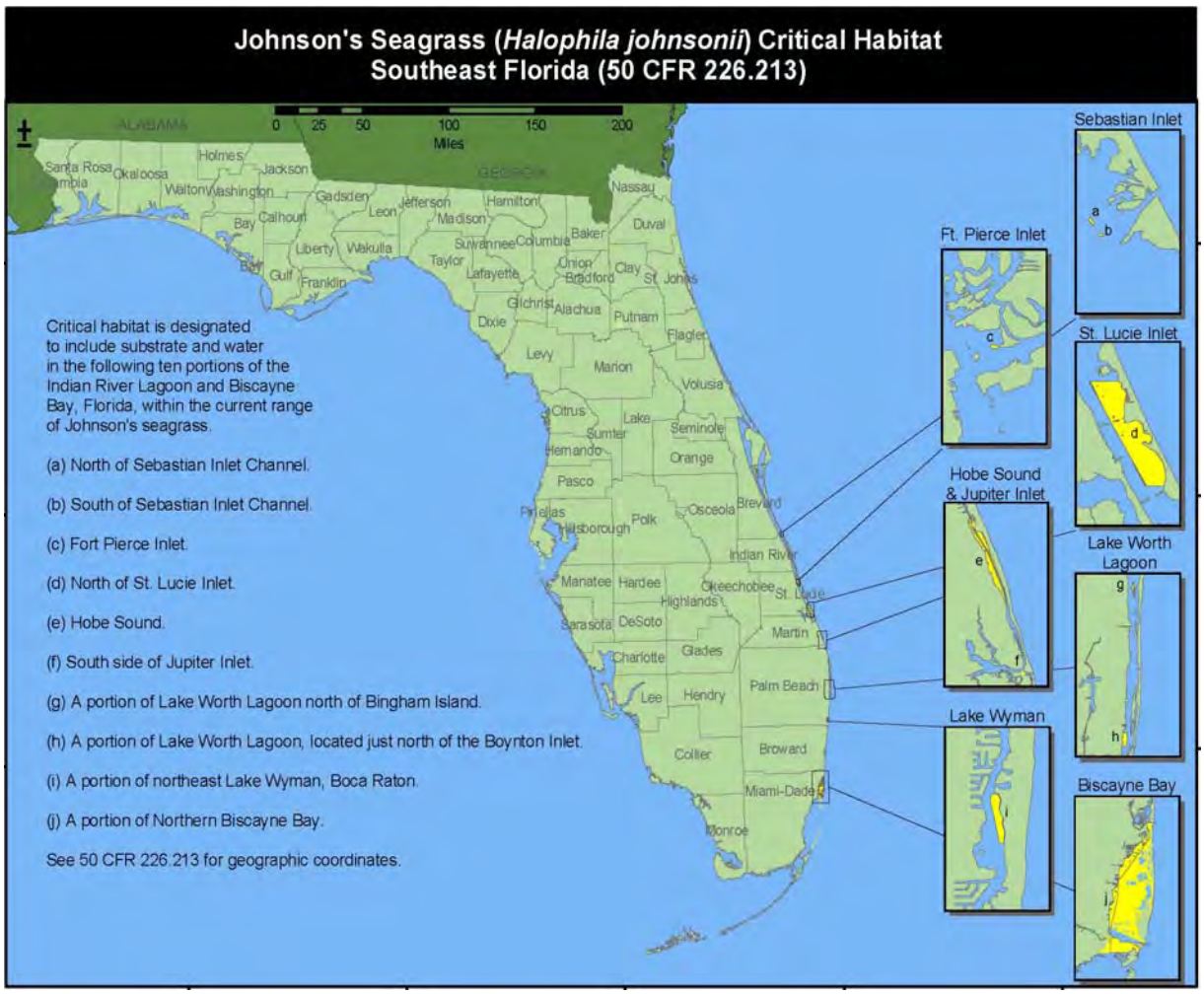

FIGURE 6. CRITICAL HABITAT FOR JOHNSONS SEAGRASS

7.0 EFFORTS TO ELIMINATE POTENTIAL IMPACTS ON LISTED SPECIES

The Corps commits to avoiding, minimizing or mitigating for adverse effects. All practicable means to avoid or minimize environmental effects were incorporated into the Proposed Action. A monitoring plan has been developed for the field test and has been included in **Appendix C**. In addition to the monitoring outlined within **Appendix C**, the Corps and South Florida Water Management District (SFWMD) will continue existing hydrologic and species monitoring plans to ensure that the Incidental Take as defined within the USFWS 2009 C-111 Western Spreader Canal Project Biological Opinion (BO) and the 2010 ERTP BO is not exceeded. In February 2012, the SFWMD completed construction of the C-111 Western Spreader Canal Project as part of its state-expedited program. The SFWMD currently conducts an annual assessment of the project in accordance with Corps permit reporting guidelines (Department of Army Permit SAJ-2005-9856 [IP-AAZ]) and the USFWS 2009 BO (http://www.fws.gov/verobeach/verobeach_olddont_delete/sBiologicalOpinion/index.cfm?method=biologicalopinion.search). Annual reporting is summarized in the South Florida Environmental Report. In accordance with the Terms and Conditions within the USFWS 2010

ERTP BO, the Corps is required to provide an annual assessment of ERTP operations. The annual assessment includes a summary of Periodic Scientist Calls, analysis of incidental take, analysis of ERTP performance measures, and ecological targets and species monitoring. The Incidental Take Statements, Terms and Conditions and Reinitiation Notice are defined in the 2010 ERTP BO (http://www.evergladesplan.org/pm/program_docs/ertp.aspx).

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9.0 LIST OF PREPARERS

Name	Affiliation	Qualification/Role
Melissa Nasuti	USACE	Biologist – Preparation
Gina Ralph	USACE	Biologist - Reviewer